Contents

Table of Contents Continued on the Next Page

Page **Table of Contents Continued**

Business Education Innovation Journal
www.beijournal.com

ISSN 1945-0915

Business Education Innovation Journal is an imprint of ELM STREET PRESS
Submissions - submit@beijournal.com

Subscriptions - subscribe@beijournal.com

Add or remove from our mailing list - mailer@beijournal.com
Write in "add" or "remove" in the topic line.

Webmaster - web@beijournal.com

Elm Street Press
350 S 200 E, Suite 301, Salt Lake City UT 84111

Welcome to this issue of the ***Business Education Innovation Journal***.

The purpose of this journal is to assemble researched and documented ideas that help drive successful learning and motivate business students to learn. The intention is to draw ideas from across both methods and disciplines and to create a refereed body of knowledge on innovation in business education. As a result, the primary audience includes business education faculty, curriculum directors, and practitioners who are dedicated to providing effective and exciting education.

We invite you to read about innovations published and apply in your classroom. We also encourage you to develop your original creative ideas, prepare an article, and submit for review.

This particular issue includes a number of interesting classroom innovations in diverse areas.

Peter J. Billington
Editor

Content Verification: The ideas presented in the journal articles are not tested nor verified for accuracy, quality, or value. The opinions and claims expressed in the articles are those of the authors and do not represent a position or opinion of the editor or staff of the Business Education Innovation Journal.

No responsibility is assumed by the Editor or Publisher for any injury and/or damage to persons or property as a matter of product liability, negligence or otherwise, or from any use or operation of any methods, products, instructions or ideas contained in the material in this journal.

Permission is not required for posting of your publication in university library depositories, and other posting websites, such as Researchgate.net and the Management Research Network of ssrn.com. The wider the distribution, the better for all of us.

Business Education Innovation Journal

Editor
Peter J. Billington, Ph.D.
Professor Emeritus, Colorado State University – Pueblo, CO
editor@beijournal.com

Editorial Review Board – Continued on the next page

Business Manager, Graphics, Design, and Production

Submissions - submit@beijournal.com

Subscriptions - subscribe@beijournal.com

Add or remove from our mailing list - mailer@beijournal.com
Write in "add" or "remove" in the topic line.

Webmaster - web@beijournal.com

Elm Street Press
350 S 200 E, Suite 301, Salt Lake City UT 84111

Subscriptions

For subscriptions to Business Education Innovation Journal, please email: **subscribe@beijournal.com**.

Subscription Rates:

Destination	*Individual **	*Institutional*	*Back Issues Individual*	*Back Issues Institutional*
United States	$50	$100	$25	$30
Countries other than the U.S.	$100	$200	$50	$60

**** Published authors are entitled to a free issue of the Journal in which their article is published.***

BEI Journal is published two times per year.

Postmaster: Please send address changes to Elm Street Press, 350 S 200 E, Suite 301, Salt Lake City, UT 84111.

Listings and Indexing

Business Education Innovation Journal is listed in the most recent on-line edition of *Cabell's Journalytics (formerly Directory of Publishing Opportunities in Management).*
www.cabells.com

Full text article access of the journal is available from EBSCO and the journal is indexed in EBSCO's databases.

BEI Journal is now fully open access to all issues. All issues are posted to our website (www.beijournal.com).

Engaging Entrepreneurial Spirits: The Norse Marketplace at Northern Kentucky University

Jeffrey Varrone, Northern Kentucky University, Kentucky USA.
Dekuwmini Mornah, Northern Kentucky University, Kentucky USA.
Zac Strobl, Northern Kentucky University, Kentucky USA.
Sarah Lingren, Northern Kentucky University, Kentucky USA.

ABSTRACT

This case study examines the Norse Marketplace, an innovative student engagement initiative at Northern Kentucky University designed to address engagement challenges among commuter and first-generation students while promoting entrepreneurial development. Drawing upon Kolb's experiential learning theory and Kuh's student engagement framework, the study analyzes the initiative's effectiveness in creating accessible engagement opportunities and fostering entrepreneurial mindsets across disciplines. The inaugural marketplace attracted 700 participants with 50 student businesses, achieving high satisfaction ratings (4.44/5) and meaningful economic impact ($2,526.70 in reported sales – 0nly 32 percent reporting). Analysis reveals that integrating entrepreneurial education with student engagement programming can effectively address participation barriers while providing valuable experiential learning opportunities. This case study contributes to understanding innovative engagement strategies in higher education, particularly for institutions serving commuter and first-generation student populations, while offering practical insights for developing similar initiatives.

Keywords: *student engagement, entrepreneurial education, commuter students, experiential learning, higher education*

INTRODUCTION

Higher education institutions increasingly face complex challenges in fostering meaningful student engagement while preparing graduates for an evolving economic landscape (Kuh et al., 2008; Ratten & Usmanij, 2021). These challenges are particularly pronounced at institutions serving predominantly commuter and first-generation student populations, where traditional engagement models often prove insufficient (Pike & Kuh, 2005; Lundberg et al., 2007). The intersection of post-pandemic learning environments, changing student demographics, and growing financial pressures has created an urgent need for innovative approaches to student engagement and entrepreneurial development (Aucejo et al., 2020; Sarasvathy & Venkataraman, 2011). Research supports that engaging students through enjoyable and immersive learning experiences significantly enhances their participation and motivation (Purinton & Burke, 2019).

Northern Kentucky University (NKU), a regional public university serving largely commuter and first-generation students, exemplifies both these challenges and the potential for innovative solutions. Like many similar institutions, NKU faces the dual challenge of creating meaningful engagement opportunities while addressing students' practical needs for career preparation and financial sustainability (Tinto, 1993). Traditional engagement approaches often fail to consider the complex lives of commuter students or address the growing need for practical entrepreneurial experience (Pittaway & Cope, 2007).

The Norse Marketplace emerged as an innovative response to these intersecting challenges. It was designed as a campus-wide entrepreneurial event where student entrepreneurs from all disciplines could set up tables to showcase and sell their products directly to the university community. Unlike traditional campus markets or fairs, the Norse Marketplace exclusively featured student-created businesses and products, with no outside vendors permitted. Students applied for table space, were provided with standardized display materials, and were responsible for all aspects of their business operations during the event – from pricing and display to customer interaction and sales transactions. This format created an authentic entrepreneurial laboratory where students could test business concepts, refine marketing approaches, and experience direct market feedback in a supportive campus environment.

Developed through collaboration between NKU's Center for Innovation and Entrepreneurship (CIE) and student organizations, this initiative reimagines student engagement through an entrepreneurial lens. The marketplace concept creates a unique platform where engagement, entrepreneurial development, and economic opportunity converge,

offering students hands-on experience in entrepreneurship while building campus connections, aligning with Kolb's (2014) experiential learning theory and Neck and Greene's (2011) practice-based approach to entrepreneurship education. This initiative aligns with best practices in experiential learning where structured experiential opportunities, such as internships or practical engagements, are shown to bridge the gap between education and real-world business application, helping students to better transition into the workforce (Tracy, 2019).

This case study examines the implementation and impact of the Norse Marketplace initiative, analyzing its effectiveness as a model for integrated student engagement and entrepreneurial development. Following Yin's (2018) case study methodology, the research addresses several key questions:

1. How can entrepreneurial activities be leveraged to enhance student engagement in predominantly commuter institutions?
2. What implementation strategies effectively support cross-disciplinary entrepreneurial learning in such environments?
3. How can institutions create accessible engagement opportunities that acknowledge students' financial needs?
4. What factors contribute to successful integration of entrepreneurial education with broader student engagement objectives?

The significance of this research extends beyond traditional entrepreneurship education. As institutions nationwide grapple with evolving student needs and changing educational landscapes, there is growing demand for innovative approaches that can address multiple institutional priorities simultaneously (Kuh, 2009). The Norse Marketplace offers one compelling model for such innovation, demonstrating how entrepreneurial education can be leveraged to enhance student engagement, provide financial opportunities, and build stronger campus communities.

Through detailed analysis of the marketplace's design, implementation, and outcomes, this study aims to provide actionable insights for institutions seeking to develop similar programs. The findings contribute to broader discussions about student engagement, entrepreneurial education, and institutional adaptation in contemporary higher education (Neck et al., 2014). As universities continue to evolve their approaches to student success, the lessons learned from this initiative offer valuable guidance for creating more inclusive, effective, and sustainable engagement strategies.

BACKGROUND AND CONTEXT

Institutional Setting

Northern Kentucky University represents a distinctive institutional context that shapes both the challenges and opportunities for student engagement and entrepreneurial development. With a total student population of 15,827 (Fall 2022), NKU exemplifies the changing demographics of contemporary higher education institutions (Pike & Kuh, 2005). NKU's student population includes 42% first-generation students, with only 14% residing on campus. The student body is split between full-time (54.6%) and part-time (45.4%) students, creating unique challenges for traditional engagement approaches (Lundberg et al., 2007).

Current Engagement Challenges

Recent National Survey of Student Engagement (NSSE) data from 2022 reveals several critical engagement challenges at NKU that mirror national trends in commuter-focused institutions. First-year students consistently scored below national averages in key areas of academic engagement, including higher-order learning (43 vs. 47 nationally) and reflective and integrative learning (37 vs. 40 nationally). These metrics align with research suggesting that commuter students often face unique barriers to engaging in high-impact educational practices (Kuh, 2009).

The engagement challenges manifest across multiple dimensions:

First, student-faculty interactions show concerning gaps, with only 24% of NKU seniors reporting regular career discussions with faculty, compared to 30% nationally. This interaction deficit particularly impacts first-generation students, who often lack informal academic and professional networks (Lundberg et al., 2007).

Second, collaborative learning opportunities are limited, with only 38% of NKU first-years reporting frequent collaboration with peers on projects, compared to 44% nationally. This collaboration gap reflects the logistical challenges faced by commuter students in participating in group activities and projects (Pike & Kuh, 2005).

Third, the post-pandemic learning environment has exacerbated existing engagement challenges. The shift to

increased online learning has contributed to social isolation and reduced campus engagement (Aucejo et al., 2020), particularly affecting students who already faced barriers to traditional campus involvement.

Fourth, financial constraints significantly impact student engagement opportunities. Traditional engagement activities often fail to acknowledge students' need for income-generating activities, creating a tension between engagement and economic necessity (Tinto, 1993).

The Center for Innovation and Entrepreneurship

Established in 2014, the Center for Innovation and Entrepreneurship (CIE) serves as NKU's primary hub for entrepreneurial education and development. The center has demonstrated significant success in its core mission, securing over $7.2 million in outside funding for student startups and facilitating the launch of more than 35 new ventures, while maintaining a 100% job placement rate for its participants. This success aligns with research suggesting the importance of dedicated entrepreneurship centers in fostering student innovation and business development (Neck & Greene, 2011).

The CIE operates several key programs that reflect contemporary best practices in entrepreneurial education (Neck et al., 2014):

- The INKUBATOR: An internationally ranked 12-week business accelerator that provides intensive support for student ventures
- INKUBIZ: A student talent development program connecting students with regional companies for real-world project experience
- JUMPSTART: An early engagement program targeting high school students for entrepreneurial development
- E-TAP: An entrepreneurship through acquisition program focusing on business succession opportunities
- African Business Connect: A program facilitating international business connections and market expansion opportunities

Despite these successful programs, the CIE faces ongoing challenges in expanding its reach beyond traditional business school audiences. This challenge reflects a broader issue in entrepreneurship education: the difficulty of communicating the value of entrepreneurial mindset development to students in sciences and humanities (Pittaway & Cope, 2007). This limitation is particularly significant given research suggesting the importance of entrepreneurial skills across disciplines (Sarasvathy & Venkataraman, 2011).

These intersecting challenges – engagement barriers, post-pandemic isolation, financial constraints, and limited awareness of entrepreneurial resources – created both a need and an opportunity for innovative solutions. The Norse Marketplace emerged as a response to these challenges, designed to create accessible engagement opportunities while promoting entrepreneurial development across disciplines.

RESEARCH DESIGN AND METHODOLOGY

This study employs a single-case study methodology to examine the implementation and impact of the Norse Marketplace initiative at Northern Kentucky University (Yin, 2018). The case study design was selected for its ability to provide rich, contextual insights into complex interventions within specific institutional settings, particularly appropriate given the initiative's multi-dimensional objectives and the need to understand its effectiveness in addressing various student engagement and entrepreneurial development challenges (Stake, 2005).

The research framework integrates multiple theoretical perspectives to capture the initiative's diverse impacts. At its foundation, the study draws upon Kolb's (2014) experiential learning theory, which provides a framework for understanding the educational value of direct market participation and real-world entrepreneurial experience. This theoretical base is complemented by Kuh's (2009) student engagement framework, offering metrics for assessing campus involvement and community building. Additionally, the study incorporates Neck and Greene's (2011) entrepreneurship education framework, emphasizing practice-based learning approaches, and Astin's (1984) theory of student involvement, which informs our understanding of engagement patterns and outcomes.

Data Collection and Analysis Framework

The study employed a comprehensive mixed-methods approach to data collection, designed to capture both quantitative outcomes and qualitative insights across multiple dimensions of impact. This methodological choice aligns with best practices in educational research (Creswell & Plano Clark, 2017) and allows for triangulation of findings across different data sources. Quantitative data collection encompassed participation metrics, economic

indicators, engagement metrics, and survey responses, providing measurable outcomes of the initiative's impact. Complementing this, qualitative data collection included participant feedback through post-event surveys, observational data from event implementation, documentary evidence of planning and execution, and diverse stakeholder perspectives from students, faculty, and staff.

The assessment framework was structured around Astin's (1984) I-E-O (Input-Environment-Outcome) model, examining the interaction between input factors such as student demographics and prior experience, environmental factors including program implementation and support structures, and outcome measures encompassing both direct participation results and broader institutional impacts. This comprehensive framework enabled systematic evaluation of the initiative's effectiveness across multiple dimensions while maintaining theoretical consistency.

Implementation Process

Implementation followed a structured four-phase approach designed to ensure systematic data collection and analysis. The planning phase (November 2023 - January 2024) focused on strategic development, including resource allocation, stakeholder engagement, and risk management planning. This was followed by an implementation phase (January - April 2024) encompassing participant recruitment, logistics coordination, and marketing execution. The execution phase (April 23, 2024) involved event operation and real-time monitoring, while the assessment phase (April 23-26, 2024) focused on comprehensive data collection and analysis.

Analysis Methods and Quality Assurance

The analysis strategy combined quantitative and qualitative approaches to ensure comprehensive understanding of outcomes. Quantitative analysis included descriptive statistics of participation and engagement, economic impact assessment, and demographic representation analysis. Qualitative analysis employed thematic analysis of participant feedback following Braun and Clarke's (2006) approach, complemented by content analysis of documentation and pattern matching with theoretical frameworks.

To ensure research rigor and validity, several quality assurance measures were implemented. These included the use of multiple data sources for triangulation, systematic documentation procedures, structured assessment protocols, and regular stakeholder validation. The integration of multiple validation strategies helped ensure the reliability and credibility of findings while maintaining methodological consistency.

Methodological Limitations

The single-case design inherently constrains generalizability, while the absence of pre-event baseline data limits certain comparative analyses. The reliance on self-reported data and potential response bias in feedback collection also present analytical challenges. Additionally, the limited longitudinal perspective constrains our understanding of long-term impacts. However, these limitations are balanced against the rich insights provided by the comprehensive data collection and analysis approach, offering valuable understanding of the initiative's impact and effectiveness in addressing student engagement and entrepreneurial development objectives.

PROGRAM IMPLEMENTATION

The implementation of the Norse Marketplace initiative involved comprehensive planning, resource allocation, and operational execution designed to address the complex challenges of student engagement and entrepreneurial development at Northern Kentucky University. This section details the systematic approach to program development and execution, examining the critical elements that contributed to the initiative's implementation.

Planning and Development

The Norse Marketplace initiative emerged from collaborative planning between the Center for Innovation and Entrepreneurship (CIE) and student organizations, particularly the Women in Entrepreneurship (WIE) and Collegiate Entrepreneurs Organization (CEO). Initial planning commenced in November 2023 with the successful application for the Amplify NKYou grant from student wellness – a grant within NKU to support student engagement activities. This early funding success proved crucial in shaping the scope and scale of the implementation plan.

Strategic planning focused on creating an inclusive and accessible platform for student entrepreneurship while addressing known engagement barriers. The planning team developed a comprehensive marketing and recruitment strategy designed to reach beyond traditional business school audiences, specifically targeting students across all colleges and disciplines. This cross-campus approach aligned with research suggesting the importance of diverse participation in entrepreneurial activities (Neck & Greene, 2011).

Resource Structure and Allocation
The initiative operated within a carefully structured budget of $3,113.75, with expenditures strategically distributed across key operational areas. The largest portion of the budget (73.8%) was allocated to entertainment and activities, including Cincinnati Circus activities ($2,000) and DJ services ($300), reflecting a deliberate emphasis on creating an engaging atmosphere. Marketing and promotional efforts consumed approximately 20.1% of the budget, encompassing yard signs ($357.75), promotional materials ($195), and various marketing supplies. This allocation strategy prioritized both participant experience and broad campus awareness.

Human resource deployment involved a matrix organizational structure comprising 11 student officers from CEO/WIE, 9 staff members, 42 student participants, and 5 student volunteers. The initiative required approximately 225 documented hours of combined effort across planning, implementation, and execution phases. This significant investment of human capital was managed through careful coordination and clear delineation of responsibilities, enabling effective resource utilization while providing valuable leadership experience for student organizers.

Operational Execution
The operational implementation followed a carefully structured timeline that balanced the need for thorough preparation with the academic calendar's constraints. The execution phase began with participant recruitment and selection through a comprehensive application and interview process conducted from January 23 to April 5, 2024. This process emphasized inclusivity while ensuring participants understood their commitments and responsibilities.

Event day execution on April 23, 2024, involved carefully orchestrated setup procedures beginning at 9:30 AM, with dedicated time slots for maintenance setup, officer organization, and participant check-in. The marketplace operated from 11:00 AM to 5:00 PM, offering flexible participation options for vendors who could choose various time slots to accommodate their schedules. This flexibility proved crucial in enabling broad participation, particularly among students with competing academic or work commitments.

Day-of-event coordination required constant monitoring and adjustment, particularly in response to environmental challenges such as wind effects on displays and the need for equipment transportation between parking areas and vendor locations. The implementation team demonstrated significant adaptability in addressing these challenges, utilizing resources such as borrowed carts from the Haile College of Business and developing impromptu solutions for display stability.

Support Systems and Risk Management
The implementation included comprehensive support mechanisms designed to ensure participant success and minimize potential risks. These systems included regular check-in procedures, ongoing monitoring of vendor needs, and flexible problem-solving approaches to address emerging challenges. The team secured the Student Union Ballroom as a weather contingency location, though this proved unnecessary for the inaugural event.

Technology integration played a crucial role in event management, though the implementation revealed opportunities for enhanced digital solutions in areas such as check-in processes and participant tracking. Communication systems were established to facilitate rapid response to emerging needs and ensure consistent information flow among all stakeholders.

Strategic Partnerships and Collaboration
The success of the implementation relied heavily on strategic partnerships both within and beyond the university. Collaboration between student organizations, academic units, and administrative departments enabled efficient resource sharing and enhanced program reach. These partnerships proved particularly valuable in addressing logistical challenges and expanding the initiative's impact across campus constituencies.

RESULTS AND OUTCOMES

The inaugural Norse Marketplace generated significant outcomes across multiple dimensions of institutional impact, demonstrating effectiveness in addressing both targeted objectives and broader institutional challenges. Analysis of quantitative metrics and qualitative feedback reveals the initiative's success in fostering student engagement, promoting entrepreneurial development, and creating meaningful economic opportunities for participants.

Participation and Engagement Outcomes
The event demonstrated substantial campus reach, significantly exceeding initial engagement targets. Direct verification confirmed 373 student attendees, while observational data suggests total attendance approached

approximately 700 participants, indicating strong campus-wide interest in the initiative. Vendor participation reached maximum capacity with 50 tables, including 40 dedicated to student businesses, demonstrating robust student interest in entrepreneurial opportunities. This strong participation aligns with Kuh's (2009) indicators of successful student engagement initiatives, particularly in commuter-heavy institutions.

Post-event survey results revealed notably positive outcomes regarding participant satisfaction and future engagement intentions. With a response rate of 32% (n=16), participants reported a mean satisfaction rating of 4.44 out of 5, with ratings ranging from 3 to 5. The strong intent for future participation proved particularly noteworthy, with 81.25% (n=13) of respondents indicating definite plans to participate in future events, while 12.5% (n=2) expressed possible interest. Only one respondent (6.25%) indicated no future participation, citing graduation as the reason. Additionally, 56.25% (n=9) of respondents expressed interest in joining entrepreneurship clubs, suggesting the event's effectiveness in fostering longer-term engagement with entrepreneurial activities.

Economic Impact and Market Learning

Economic outcomes, while based on partial reporting, demonstrated meaningful financial impact for participating vendors. The total reported sales reached $2,526.70, with individual vendor performance varying considerably. The mean sales per reporting vendor was $158.00, with a range from $25 to $850. The top-performing vendor reported sales of $850, while the second-highest achieved $467, demonstrating the potential for significant individual success within the marketplace format.

More significantly, participants gained valuable insights into market dynamics and pricing strategies. Qualitative feedback revealed important learning about price point optimization, particularly regarding the student market. As one vendor observed, "I was a little disheartened that I didn't sell anything - but maybe things in the $30 - $50 range are too expensive?" This real-world learning about price sensitivity and market dynamics exemplifies Kolb's (2014) experiential learning principles, providing practical insights that complement theoretical business education.

Community Building and Professional Development

The marketplace proved particularly effective in fostering cross-disciplinary connections and building community among participants. Qualitative feedback emphasized the value of peer interactions and professional networking opportunities. One participant noted, "If you had meetings where we could meet the other entrepreneurs and mingle that would be really cool," indicating opportunities for enhancement.

The entrepreneurial learning experience proved particularly valuable in building participant confidence and professional skills. As evidenced by one participant's reflection: "I never expected my crochet stuff to sell and the amount of support I got from students and teachers was beyond what I thought would happen!" Such testimonials demonstrate the initiative's success in creating authentic entrepreneurial experiences while building student confidence, aligning with Neck and Greene's (2011) emphasis on practice-based entrepreneurial learning.

Operational Insights and Enhancement Opportunities

Analysis of event execution revealed several areas for potential enhancement in future iterations. Event timing and duration emerged as key considerations, with participants suggesting modifications to the schedule. Environmental factors and location strategy also emerged as areas for refinement, with specific suggestions for weather contingency planning and traffic flow optimization.

The implementation demonstrated particular effectiveness in creating an inclusive and accessible format for student participation. The flexible scheduling options and low barriers to entry enabled participation from students across various disciplines and with different time commitments, addressing known challenges in engaging commuter student populations (Pike & Kuh, 2005).

DISCUSSION

The Norse Marketplace initiative provides significant insights into the intersection of student engagement, entrepreneurial education, and institutional effectiveness in contemporary higher education. Analysis of the initiative's outcomes offers valuable perspectives on addressing engagement challenges in commuter-heavy institutions while advancing entrepreneurial education objectives. This discussion examines the theoretical implications of our findings, practical applications for higher education institutions, and broader implications for student success programming.

Theoretical Implications

The outcomes of the Norse Marketplace substantially align with existing theoretical frameworks in student engagement and entrepreneurial education. The initiative's success in attracting approximately 700 participants and achieving high satisfaction ratings (4.44/5) strongly supports Astin's (1984) theory of student involvement, which posits that student learning and development are directly proportional to the quality and quantity of student engagement. More significantly, the marketplace format demonstrated particular effectiveness in creating what Kuh (2009) defines as high-impact educational practices, providing students with opportunities for active learning, real-world application, and meaningful peer interaction.

The entrepreneurial learning outcomes observed align closely with Kolb's (2014) experiential learning theory, demonstrating the value of integrated learning experiences. Participants engaged in a complete learning cycle, from concrete experience through reflective observation and abstract conceptualization to active experimentation. This was evidenced in their real-time adjustments to pricing strategies, marketing approaches, and customer interaction methods. The success of this practical learning approach supports Neck and Greene's (2011) assertion that entrepreneurship education is most effective when treated as a method rather than a discrete subject.

Practical Implications for Higher Education

The Norse Marketplace demonstrates several significant practical implications for higher education institutions, particularly those serving commuter and first-generation student populations. The initiative's success in achieving multiple institutional objectives with relatively modest resource investment ($3,113.75) suggests a scalable model for student engagement and entrepreneurial development. This efficiency in resource utilization is particularly relevant given current financial constraints in higher education (Aucejo et al., 2020).

Particularly noteworthy is the initiative's effectiveness in addressing multiple institutional challenges simultaneously. The marketplace format successfully bridged traditional gaps between academic learning and practical experience while creating opportunities for financial benefit among participating students. This multi-dimensional impact suggests valuable possibilities for institutions seeking to maximize the return on investment in student engagement programming. The high rate of intended future participation (81.25%) and strong interest in entrepreneurship clubs (56.25%) indicate the potential for sustainable impact on student engagement patterns.

Innovation in Student Engagement

The marketplace model represents an innovative approach to student engagement that extends beyond traditional programming. By combining entrepreneurial education with community building and direct economic opportunity, the initiative addresses several contemporary challenges in higher education. The success in attracting cross-disciplinary participation suggests potential for breaking down traditional silos between business education and other academic disciplines, addressing a persistent challenge in entrepreneurship education (Pittaway & Cope, 2007).

The implementation model demonstrated particular effectiveness in engaging commuter students, a traditionally challenging population for campus involvement. The combination of structured activity with flexible participation options appears to offer a promising approach for institutions seeking to enhance commuter student engagement. The economic outcomes, while varied, indicate potential for addressing financial barriers to student engagement through integrated entrepreneurial opportunities.

Contributions to Practice

This case study makes several significant contributions to higher education practice. First, it provides a detailed implementation model for integrating entrepreneurial education with broader student engagement objectives. Second, it demonstrates the feasibility of creating meaningful economic opportunities within educational programming. Third, it offers practical insights into managing the complexities of large-scale student engagement initiatives while maintaining academic rigor and learning outcomes.

The documented challenges and solutions provide valuable guidance for institutions considering similar programs. The importance of flexible planning approaches, comprehensive support systems, and attention to accessibility emerged as key success factors. The initiative's ability to generate both immediate impacts and longer-term engagement suggests potential for sustainable program development across various institutional contexts.

Future Research Directions

Several promising directions for future research emerge from this study. Longitudinal research tracking participant outcomes could provide valuable insights into the lasting impact of such initiatives on student success and

entrepreneurial development. Comparative studies across institutions could help identify key success factors and institutional considerations affecting program outcomes. Additionally, investigation of how similar models might be adapted for different institutional contexts and student populations could enhance understanding of program scalability and transferability.

The success of the Norse Marketplace suggests opportunities for expanding the model to address other institutional priorities. The marketplace format could be adapted to support specific academic programs, career development objectives, or community engagement goals. The successful integration of multiple institutional objectives suggests potential for further innovation in program design and implementation.

LIMITATIONS AND CONSIDERATIONS

Several limitations should be noted when interpreting these results. The relatively low survey response rate (32%) may not fully represent the participant experience. The reliance on self-reported sales data and the analysis of a single event implementation limit the generalizability of findings. Additionally, potential response bias in feedback collection should be considered when evaluating qualitative outcomes.

Despite these limitations, the combination of strong quantitative metrics and positive qualitative feedback suggests a promising foundation for future development. The initiative's success in simultaneously addressing multiple institutional challenges - from engagement to economic opportunity - provides valuable insights for future iterations and potential replication at other institutions. These results demonstrate the viability of integrated approaches to student engagement and entrepreneurial development, particularly in institutions serving commuter and first-generation student populations.

CONCLUSION

The Norse Marketplace initiative demonstrates the potential for innovative programming to address multiple institutional challenges while advancing entrepreneurial education and student engagement objectives in higher education. Through careful examination of this case, several significant conclusions emerge about the effectiveness of integrated approaches to student success programming in predominantly commuter-based institutions, offering valuable insights for both practice and theory in higher education.

The initiative's success in attracting approximately 700 participants, achieving high satisfaction ratings (4.44/5), and generating meaningful economic activity ($2,526.70 in reported sales) demonstrates the viability of combining entrepreneurial education with student engagement programming. These outcomes are particularly significant given the institutional context of Northern Kentucky University, where traditional engagement approaches often face substantial barriers due to the predominantly commuter student population. The high rate of intended future participation (81.25%) and strong interest in entrepreneurship clubs (56.25%) suggest sustainable impact potential, indicating the program's ability to create lasting engagement patterns among traditionally hard-to-reach student populations.

Beyond direct entrepreneurial learning outcomes, the marketplace format successfully facilitated cross-disciplinary interaction, created authentic learning experiences, and provided economic opportunities for participants. This comprehensive impact demonstrates how carefully designed initiatives can address multiple institutional priorities simultaneously, offering an efficient model for resource allocation in student success programming. The success in combining educational objectives with practical economic benefits provides a compelling model for engaging students who might otherwise find traditional engagement activities inaccessible due to financial constraints.

The implementation experience offers several crucial insights for institutions considering similar initiatives. First, program design must prioritize flexibility and accessibility, particularly for commuter and working student populations. The Norse Marketplace's success in this regard stemmed from careful attention to scheduling, format, and participation requirements that acknowledged the complex lives of non-traditional students. Second, implementation planning should include robust contingency measures and support systems to address operational challenges, as demonstrated by the initiative's ability to overcome various logistical and environmental obstacles. Third, assessment frameworks should capture both immediate outcomes and longer-term impact on student engagement and success, enabling continuous improvement and program refinement.

The importance of strategic partnerships, both within and beyond the institution, emerged as a critical success factor.

Future implementations should consider early engagement with potential partners and stakeholders to maximize resource availability and program impact. Additionally, the integration of technology solutions for program management and participant support warrants careful consideration in program design, particularly as institutions seek to scale similar initiatives.

Looking forward, this case study suggests several promising directions for future research and program development. Longitudinal studies tracking participant outcomes could provide valuable insights into the lasting impact of such initiatives on student success and entrepreneurial development. Comparative analysis across institutions could help identify key success factors and institutional considerations affecting program outcomes. Additionally, investigation of potential adaptations for different institutional contexts and student populations could enhance the model's applicability across diverse educational settings.

The Norse Marketplace case demonstrates the potential for innovative approaches to address contemporary challenges in higher education. In an era of increasing attention to student engagement, career preparation, and educational value, initiatives that successfully integrate multiple institutional objectives while providing tangible benefits to students warrant serious consideration. The success of this model suggests opportunities for reimagining student success programming to better serve diverse student populations while advancing institutional priorities.

As higher education continues to evolve in response to changing student needs and societal expectations, the importance of innovative, integrated approaches to student success programming becomes increasingly apparent. The Norse Marketplace provides one compelling model for such innovation, demonstrating how careful attention to program design, implementation, and assessment can create meaningful impact across multiple dimensions of the student experience. Future development and research can build upon these insights to further enhance our understanding of effective practices in student engagement and entrepreneurial education, ultimately contributing to more inclusive and effective higher education environments.

REFERENCES

Astin, A. W. (1984). Student involvement: A developmental theory for higher education. *Journal of College Student Personnel, 25*(4), 297-308.

Aucejo, E. M., French, J., Ugalde Araya, M. P., & Zafar, B. (2020). The impact of COVID-19 on student experiences and expectations: Evidence from a survey. *Journal of Public Economics, 191*, 104271.

Berardino, L., Casey, J., Everling, K. M., Kim, Y., & Tang, L. (2019). Design culture, immersion, visuo-spatial learning: Re-envisioning training. Business Education Innovation Journal, 11(2), 49-56.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101.

Creswell, J. W., & Plano Clark, V. L. (2017). *Designing and conducting mixed methods research* (3rd ed.). Sage Publications.

Kolb, D. A. (2014). *Experiential learning: Experience as the source of learning and development*. FT press.

Kuh, G. D. (2008). *High-impact educational practices: What they are, who has access to them, and why they matter*. Association of American Colleges and Universities.

Kuh, G. D. (2009). What student affairs professionals need to know about student engagement. *Journal of College Student Development, 50*(6), 683-706.

Kuh, G. D., Cruce, T. M., Shoup, R., Kinzie, J., & Gonyea, R. M. (2008). Unmasking the effects of student engagement on first-year college grades and persistence. *The Journal of Higher Education, 79*(5), 540-563.

Lundberg, C. A., Schreiner, L. A., Hovaguimian, K., & Miller, S. S. (2007). First-generation status and student race/ethnicity as distinct predictors of student involvement and learning. *NASPA Journal, 44*(1), 57-83.

Neck, H. M., & Greene, P. G. (2011). Entrepreneurship education: Known worlds and new frontiers. *Journal of Small Business Management, 49*(1), 55-70.

Neck, H. M., Greene, P. G., & Brush, C. G. (2014). *Teaching entrepreneurship: A practice-based approach*. Edward Elgar Publishing.

Northern Kentucky University Center for Innovation and Entrepreneurship. (2024). *Annual report 2023-2024*.

Northern Kentucky University. (2022). *Common data set 2022-2023*. Office of Institutional Research.

Northern Kentucky University. (2022). *National Survey of Student Engagement (NSSE) results report*. Office of Institutional Research. https://inside.nku.edu/content/dam/IR/docs/NSSE/NSSE22%20Engagement%20Indicators%20(NKU).pdf

Pike, G. R., & Kuh, G. D. (2005). First- and second-generation college students: A comparison of their engagement and intellectual development. *The Journal of Higher Education, 76*(3), 276-300.

Pittaway, L., & Cope, J. (2007). Entrepreneurship education: A systematic review of the evidence. *International Small Business Journal, 25*(5), 479-510.

Purinton, E. F., & Burke, M. M. (2019). Student engagement and fun: Evidence from the field. Business Education Innovation Journal, 11(2), 16-23.

Ratten, V., & Usmanij, P. (2021). Entrepreneurship education: Time for a change in research direction? *The International Journal of Management Education, 19*(1), 100367.

Sarasvathy, S. D., & Venkataraman, S. (2011). Entrepreneurship as method: Open questions for an entrepreneurial future. *Entrepreneurship Theory and Practice, 35*(1), 113-135.

Stake, R. E. (2005). Qualitative case studies. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (3rd ed., pp. 443-466). Sage.

Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed.). University of Chicago Press.

Tracy, J. M. (2019). Structured internships: Bridging the education to business gap. Business Education Innovation Journal, 11(2), 28-33.

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). Sage Publications.

Math Puzzles as Optimization Models: Pegg's Mail-Order Pricing Problem

Robert C. Forrester, Midwestern State University - Wichita Falls, Texas, USA
Mike C. Patterson, Midwestern State University - Wichita Falls, Texas, USA

ABSTRACT

The increasing adoption of business analytics has generated higher demand for students proficient in this field. Consequently, the use of puzzles as a pedagogical approach to teaching business analytics is gaining popularity in classroom settings. The models presented in this paper are designed to illustrate how one can utilize existing software approaches to formulate and solve a wide range of optimization challenges. The math puzzle selected to illustrate the process of formulating the problem as an optimization model is written by Ed Pegg (Downloaded on January 6, 2024 from http://www.mathpuzzle.com /BrainBustersFinal.pdf): Al, Bob, Cal, Dot, and Ed all bought items from the mail-order magazine. Al & Bob paid $150, Bob & Cal paid $200, Cal & Dot paid $170, Dot & Ed paid $210, and Ed & Al paid $100. How much did each person spend?©

Keywords: Spreadsheet, Model, Optimization, Recreational Math, Excel Solver, LINGO

INTRODUCTION

The increasing adoption of business analytics across industries has generated significantly higher demand for students proficient in this multifaceted field. Organizations now actively seek graduates who can effectively analyze complex datasets, identify patterns, and derive actionable insights to drive strategic decision-making. Consequently, educational institutions are exploring innovative teaching methodologies to develop these critical analytical skills. The use of puzzles as a pedagogical approach to teaching business analytics is gaining popularity in classroom settings, as this method encourages critical thinking, problem-solving abilities, and practical application of theoretical concepts (Forrester, Martinez & Patterson, 2024). These puzzle-based learning activities simulate real-world scenarios, requiring students to apply analytical techniques while fostering engagement and retention of key concepts. This approach bridges the gap between theoretical knowledge and practical application, better preparing students for the analytical challenges they will encounter in their professional careers.

The widespread popularity of Sudoku has contributed to a renewed interest in math puzzles in general. The types of puzzles, popularized by Martin Gardner in his long-running column *Mathematical Games (Scientific American*, 1956-1980), have their roots in the field known as recreational mathematics (Yam, 2010). Other well-known writers in the field include H. Dudeney, Sam Loyd, Marilyn vos Savant, and Charles Dodgson, better known as Lewis Carroll, author of *Alice in Wonderland.* The application of puzzles in pedagogy of business education and training is used throughout the popular text: *Behavioral Finance: Investors, Corporations and Markets* (Yazdipour, & Howard, 2010). By combining math puzzles with other pedagogical tools, such as LINGO and Excel Solver optimization tools, students are taught to frame problems such as the software will assist them in mathematical simplification of the problems. These skills can then be generalized into real-world applications (Albritton & McMullen, 2006; Gass, Hirshfeld & Wasil, 2000; Sotomayor, Fiestas, Vergaray & Flores,2021).

STATEMENT OF MATH PUZZLE AS AN OPTIMIZATION MODEL

The math puzzle selected to illustrate the process of formulating the problem as an optimization model is written by Ed Pegg (2010). Pegg, one of the chief consultants to the television series Numb3rs, is the author of numerous puzzles and maintains a comprehensive puzzle-oriented website (mathpuzzle, 2013). The puzzle selected (Pegg, 2010) was originally printed in the Japan Airlines inflight magazine, *Skyward.* The puzzle is shown below.

> Al, Bob, Cal, Dot, and Ed all bought items from the mail-order magazine. Al & Bob paid $150, Bob & Cal paid $200, Cal & Dot paid $170, Dot & Ed paid $210, and Ed & Al paid $100. How much did each person spend?©

MATHEMATICAL FORMULATION OF PUZZLE

The mathematical formulation for this puzzle is displayed below.

Objective: Minimize A

Subject to: A + B = 150
B + C = 200
C + D = 170
D + E = 210
E + A = 100
A B, C, D, E = integer

Where: A = Al
B= Bob
C = Cal
D = Dot
E = Ed

LINGO Formulation and Solution to Puzzle

LINGO is an optimization software tool developed by LINDO Systems (2013). It is a popular and widely used optimization tool in operations research classes. One of the reasons for the popularity of LINGO is the similarity between the general mathematical formulation (as shown above) and the LINGO formulation. The LINGO formulation is displayed in Figure 1. The LINGO solution to this problem is displayed in Figure 2. As shown, the solution to the puzzle is Al=$5, Bob=$145, Cal=$55, Dot=$115, and Ed=$95. All the constraints, including the integer requirements, are satisfied.

Figure 1: LINGO Formulation of Puzzle

```
MODEL:
MIN  = A
A+B=150;
B+C=200;
C+D=170;
D+E=210;
E+A=100;
@GIN (A);
@GIN (B);
@GIN (C);
@GIN D);
@GIN (E);
END
```

Figure 2: LINGO Solution of Puzzle

```
Global optimal solution found.
Objective value:                5.000000
Objective bound:                5.000000
Infeasibilities:                0.000000
Extended solver steps:                0
Total solver iterations:              0
Variable    Value       Reduced Cost
```


Figure 2: LINGO Solution of Puzzle (cont.)

A	5.000000	1.000000
B	145.0000	0.000000
C	55.00000	0.000000
D	115.0000	0.000000
E	95.00000	0.000000
Row	Slack or Surplus	Dual Price
1	5.000000	-1.000000
2	0.000000	0.000000
3	0.000000	0.000000
4	0.000000	0.000000
5	0.000000	0.000000
6	0.000000	0.000000

EXCEL SPREADSHEET FORMULATION

Microsoft Excel provides an optimization option as part of the standard package of add-ins. The software, called Solver, was developed by Frontline Systems (Frontline Systems, n.d.), a leading software optimization company. The basic Solver was utilized for this model. The initial spreadsheet formulation is displayed in Figure 3. Cells B5:F5 hold five sums for the constraints. Cells B3:F3 are the cells which will be changed during the optimization process and will hold the amount spent by each person. Cells B6:F6 will hold the actual sums which must match the amounts defined in cells B5:F5. Figure 4 displays the formula view of the model. Figure 5 displays the final Solver spreadsheet solution, which is identical to the LINGO solution.

Figure 3: Initial Solver Spreadsheet Formulation of Math Puzzle

1/A	B	C	D	E	F
2	A	B	C	D	E
3	0	0	0	0	0
4	A+B	B+C	C+D	D+E	E+A
5	150	200	170	210	100
6	0	0	0	0	0

Figure 4: Formula View Spreadsheet Formulation of Math Puzzle

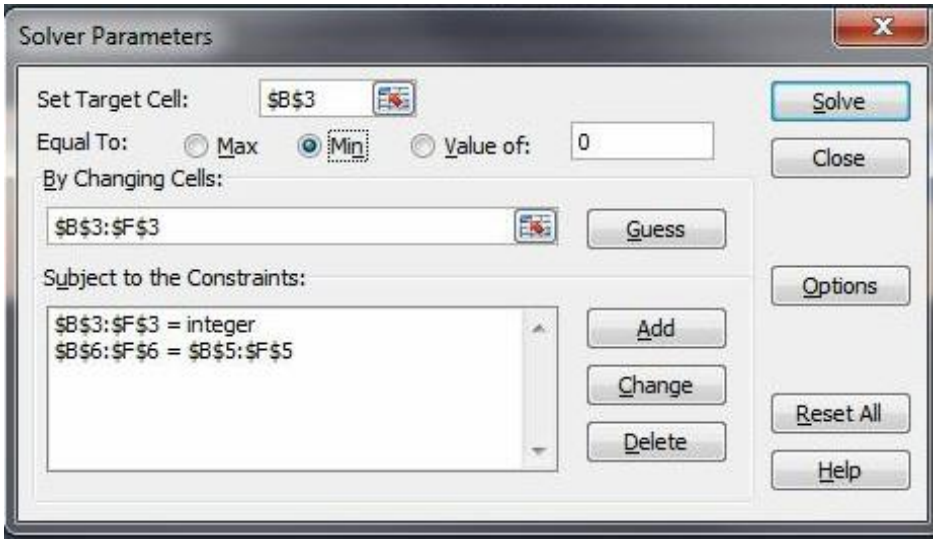


Figure 5: Final Solver Spreadsheet Solution of Math Puzzle

1/A	B	C	D	E	F
2	A	B	C	D	E
3	5	145	55	115	95
4	A+B	B+C	C+D	D+E	E+A
5	150	200	170	210	100
6	150	200	170	210	100

SUMMARY

As part of the field known as recreational mathematics, puzzles have long been popular. The puzzle selected for this paper is fairly representative of numerous puzzles which have been developed over the past several decades. Both the LINDO and Solver models presented in this paper are designed to illustrate how one can utilize existing software approaches to formulate and solve a wide range of optimization challenges

REFERENCES

Albritton, M. D., & McMullen, P. R. (2006). Classroom integration of statistics and management science via forecasting. *Decision Sciences Journal of Innovative Education*, *4*(2), 331.Frontline Systems. (n.d.) Downloaded on January 4, 2024 from http://solver.com.

Forrester, R. C., Martinez, J. E., & Patterson, M. C. (2024). Teaching Business Analytics: Do Dogs Know Calculus?. *Business Education Innovation Journal*, *16*(1).

Gass, S. I., Hirshfeld, D. S., & Wasil, E. A. (2000). Model world: The spreadsheeting of OR/MS. *Interfaces*, *30*(5), 72-81.

LINDO Systems. (2013). Downloaded on January 3, 2024 from http://www.lindo.com/.

MathPuzzle. (2013). Downloaded on January 2, 2024 from http://www.mathpuzzle.com/

Pegg, E. (2010). Brainbusters. Downloaded on January 6, 2024 from http://www.mathpuzzle .com/BrainBustersFinal.pdf

Sotomayor, N. A. O., Fiestas, L. A. Z., Vergaray, J. M., & Flores, E. (2021). Optimization Software in Operational Research Analysis in a Public University. *REVISTA GEINTEC-GESTAO INOVACAO E TECNOLOGIAS*, *11*(4), 3061-3079.

Yam, P. (2010) Profile: Martin Gardner, the Mathematical Gamester (1914-2010. Downloaded on January 12, 2024 from http://www.scientificamerican.com/article.cfm?id=profile-of-martin-gardner

Yazdipour, R., & Howard, J. A. (2010). Behavioral finance: Application and pedagogy in business education and training. *Behavioral finance: Investors, corporations, and markets*, *6*.

Robert C. Forrester is the Chair of Economics and Finance and the Dillard Distinguished Professor of Energy Finance at Midwestern State University.

Mike C. Patterson is a professor of operations management at Midwestern State University. Dr. Patterson has been teaching operations and quantitative methods for 45 years.

Subjective Norms, Word-Of-Mouth, and Use Intention

Nazim Taskin, PhD - Bogazici University, İstanbul, Turkiye
Sweety Law, PhD - California State University East Bay, Hayward, CA
Jacques Verville, PhD

ABSTRACT

This study examined the relation between subjective norms and user intention in a wearable sharing-technology innovation. Based on field research of active users at two sites (one institution in USA and the other in New Zealand), the paper presents a new perspective to rethink subjective norms. An online survey was conducted using an instrument developed by adapting previously validated scales. The article reports the findings from an international cross-section of senior year college students. Although attending university, more than 70% held jobs with at least one-third holding full-time employment. More than 50% were 25 years and older and 18% were studying in a graduate/post-graduate program. Given the non-traditional demographics of the student-participants, mature considered responses relevant to the workplace might be assumed, quite different from students who are fresh out of high school with little to no work experience. The major finding indicates that subjective norms are more likely malleable attitude-rationale developments arising from interaction dynamics, than held beliefs about what important others think. For future researchers, this paper presents a theoretical model of the relation between word-of-mouth and subjective norms affecting user intention and use continuance. For information system and general management instructors, the insights offer guidance for change management. For business managers planning information systems changes, the paper suggests why they may wish to consider an interpersonal view of subjective norms as it affects organizational systems and how they may go about its implementation.

Keywords: Sharing technology, innovation adoption, subjective norms, word-of-mouth, innovation attributes, and use intention

INTRODUCTION

To remain viable, all organizations need to innovate also in processes and operations, not just in new product offerings. It is not just in services marketing; any organization planning to introduce new technology in operations needs to undertake internal marketing to persuade and gain support from employees. Today's rapid deployment of cutting-edge technology has resulted in a more dynamic technology dissemination process than in the past. If user acceptance factors are ignored during the introduction process, the ways people cognitively process and use the innovation, and ultimately its effectiveness would not be known (Rosli et al, 2022). As Bhattacherjee and Lin (2015) observed "Information technology acceptance and continuance are conceptually and temporally distinct behaviors, in that continuance can occur only after first-time use (acceptance). As information and communication technologies (ICT) increasingly pervade all aspects of our lives, understanding *what* influences individuals' decisions to accept-adopt and use these technologies continues to be relevant (Graf-Vlachy et al, 2018). *How such influences work* is equally pertinent to any understanding of the factors.

In technology adoption studies, the role of subjective norms continues to intrigue researchers. While powerful in its simplicity, the technology adoption model (Davis, 1989) -- or TAM – was critiqued for excluding social influence; and consequently spawned TAM2 (Venkatesh and Davis, 2000), which focused on subjective norms to examine social influence. In a study on the particular role of subjective norms, Schepers and Wetzels (2007) conducted a quantitative meta-analysis of technology adoption research in an attempt to make well-grounded statements on the role of subjective norms. Yet even TAM3 (Venkatesh and Bala, 2008) and other derived studies continued to strive for a better understanding of subjective norms as empirical results were inconsistent in determining its role in user intention and actual use.

In the continued research, studies preferring to use 'subjective norms' as internal motivation have drawn from psychological studies particularly theories of reasoned action (TRA) (Fishbein, 1967; Fishbein and Ajzen, 1975) and planned behavior (TPB) (Ajzen, 1991). Research choosing to use 'social influence', premised as external motivation, mostly flowed from the unified theory of acceptance and use of technology (UTAUT) (Venkatesh, et al, 2003), which synthesized a variety of technology acceptance models, and included a sub-construct subjective norms' (Venkatesh et al., 2012).

In marketing studies, terms used varies among 'social norms' (Hardie, et al. 1996), 'subjective norms' (Morwitz, 1997), and 'social influence' (Cialdini and Goldstein, (2004); Herbjørn et al., (2005). Yet another study called it the desire to conform to a group norm or the normative reference group influence (Bearden and Etzel, (1982). All terms are often used interchangeably, derive from TPB and TRA, and refer to an individual's attributes. Thus, prevailing in the extant literature, 'intentions' capture the motivational factors influencing behavior, indicating how hard one is willing to try and how much effort one plans to exert to perform a particular behavior (Irimia-Diéguez et al, 2023). However, leading information system (IS) scholars (Legris et al. 2003; Bagozzi 2007) have repeatedly identified limitations in the field's conceptualizations of social influence and called for a better representation of social change processes (Graf-Vlachy et al 2018).

That the direct effect of subjective norms on user intention cannot be assumed even in mandatory contexts that dominate IS research on technology adoption, begs the question: might subjective norms be socially constructed, and not only located in belief and perception – persuading the user in either direction despite their pre-existing beliefs and perceptions about the technology? Might subjective norms be negotiated understanding that directly affects user intention of use and actual/continued use? How might a user's interactions form antecedents to, and possibly modify, subjective norms? Another study indicated that a single cumulative subjective norm measure might be too naïve and that future research might considerably improve our understanding of IT adoption and non-adoption by studying the differential impact of various peer groups on adoption intention, and also on its antecedents (Andreas et al, 2007; Eckhard et al, 2009). Clearly, technology adoption research is still grappling to incorporate normative beliefs and concepts into technology acceptance research.

RESEARCH QUESTION

In this study, we seek to examine how subjective norms might influence a user's decision to adopt a personal wearable technology with live interaction capability. We are interested to determine any causal processes and effects of subjective norms on a user's intention to use (or not) and how word-of-mouth and innovation attributes may mediate subjective norms, external influences, and perceived behavioral control. This view is in line with a previous study that explored why adoption decisions in groups change over time -- affected by external and internal team events as well as group characteristics. In our view, innovation use intention and actual use for an individual can change owing to interaction triggered by external and internal factors including personal and group characteristics as well as team events (Bayerl et al., 2016). Thus, subjective norms are not a held constant preceding use intention. Whereas most studies incorporating subjective norms premise the concept as situated in beliefs or perceptions, we view subjective norms as more than beliefs, more akin to 'malleable attitude-rationale configurations' (Bayerl et al., 2016) arising from communication and negotiation.

Viewed as beliefs or perceptions, subjective norms provide psychological understanding of a user's choice (their intention to adopt a new technology or not); viewed as malleable attitude-rationale configurations, subjective norms predicate the individual as an active agent located within a context, and registering and responding to context and environment forces. Therefore, we hypothesize that interaction behaviors and information flow, moderated in part by beliefs and in part by innovation attributes as well as individual reactions and interactions, likely generate some tension that would give rise to or modify subjective norms – which then affect user intention and actual use/continuance of use. Thus, the overarching research question is: To what extent is a user's intention to use a new technology directly impacted by subjective norms mediated through word-of-mouth, innovation attributes, external influences, and perceived behavioral control.

LITERATURE REVIEW

Drawing theoretical underpinnings from TRA and TPB, both information system research as well as marketing research similarly anchor subjective norms in beliefs, attitudes, and cognitive structures. TAM argued that a user's technology acceptance was determined by two beliefs: perceived usefulness and perceived ease of use. A previous study integrated TAM-TPB suggested that the two core concepts of TAM are subsumed in the TPB core construct of *attitude* (Taylor and Todd, 1995). TAM2 expanded TAM by showing how social forces tapped via subjective norms, effected by internalization and identification beliefs, exert significant direct effect on user intention. Integrating the varied acceptance models, UTAUT embeds subjective norms in a construct called "social influence", which is defined as "the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al, 2003). Thus, TAM2, UTAUT, and their derivative studies are premised on the view of subjective

norms as defined by TRA: "… a person's perception that most people who are important to him think he should or should not perform the behavior in question (Fishbein and Ajzen, 1975).

In the meta-analysis of UTAUT-derived studies (Dwivedi, et al, 2017), interestingly, even studies choosing the construct 'social influence' are premised on a definition of subjective norms as outlined in TRA and TPB. Importantly, the study found that an individual's attitude may be moderated by social influence and facilitating conditions -- which they term 'contextual factors (Dwivedi, et al, 2017). Notably, another study demonstrated a substitution relationship or negative synergy between attitude and subjective norms (Titah and Barki, 2009). TAM and derived studies essentially assumed that subjective norms were social factors that somehow altered belief structures to directly affect user intention or to create positive attitudes relating to behavioral intention.

Missing is the process or conditions by which subjective norms may be developed or the manner in which any effect by them or change to them might occur. This indicated the possibility of new propositions suggested by their substitution relationship observed between attitude and subjective norms (Titah and Barki, 2009). One proposition to examine in our view is how any substitution relation might be effected in process, during interactions. Could word-of-mouth cause *in situ* an increase in subjective norms that would reduce the impact of individual attitude? This contends that sometimes users may not even have the knowledge of their own preferences (Morwitz. 1997). Furthermore, factors that heighten the salience of others' preferences can *either increase or decrease* the accuracy of predicting behavior/intent (Morwitz, 1997). This study seeks understanding of how consumers come to view a wearable personal technology of the social-public kind, specifically what and how influences occur to modify any individual's technology adoption behaviors.

A study by Eckhardt, et al (2009) concluded that a single cumulative subjective norm measure might be too naive and that future research might considerably improve our understanding of IT adoption and non-adoption by revealing the differential impact of various peer groups on adoption intention, and also on its antecedents. In their extensive review of social influence in technology acceptance, Graf-Vlachy and associates (2018) encourage future IS researchers to adopt a multi-theoretical approach and to actively elaborate on the distinct theoretical mechanisms by which different social influence processes can affect technology adoption and use.

This study offers an interactive perspective to consider subjective norms. In both TRA and TPB, subjective norms are viewed as beliefs that have a direct effect on behavioral intention. TAM, TAM2, integrated TAM-TPB, UTAUT and consequent information systems studies as well as marketing research, more or less reinforce this view of subjective norms. Yet even this cross-contextual view of subjective norms did not consistently hold true in compliance contexts such as the workplace. While information technology can have many benefits, companies often have problems when introducing information systems into their business processes (Schepers and Wetzels (2007). Organizational inertia to change is most noticeable in efforts for new technology introductions or updates (Devaraj et al, 2008). It is a fact that many organizations may adopt new systems but do not enforce its use. Furthermore, individuals also have discretion regarding the extent to which they will use a system's various functionalities (Titah and Barki, 2009).

Consequently, we propose that subjective norms are not just fixed one-time perceptions or beliefs; nor only a summary index of perceptions. Rather, they derive from and are contingently modified by internal factors and emergent conditions to influence attitudes and behavior. In particular, the effect of personal and virtual word-of-mouth on subjective norms in shaping intention to use a technological innovation is explored in this study. This research proposes that the interaction and information flow enabled and spurred by certain sharing technology have an immediacy that would enhance subjective norms to influence technology use (or non-use). Furthermore, innovation attributes especially results demonstrability, perceived ease of use, and image create causal conditions for word-of-mouth that express or strengthen/weaken subjective norms and consequently intention to use/not use. To that end, we posit subjective norms as responsive attitude-rationale developments having significant impact on use intention -- which may be explained by a model that incorporates innovation diffusion theory, theory of planned behavior, and effects of word-of-mouth on technology acceptance.

METHODOLOGY

The study investigated usage intentions of a personal wearable technology with live interaction capability. The population of the study comprised every individual having access to social media. Data were collected from university

students at two locations (one institution in USA and the other in New Zealand). Data collection medium was an online survey designed specifically for the study. During the data collection, no incentives was offered to participants.

The survey instrument was developed adapting previously validated scales. Result demonstrability, Image, Ease of use, and Relative Advantage were adapted using Likert-scale of 7 where responses varied between "extremely agree" and "extremely disagree" (Maxham III, 2001). Personal word-of-mouth was adapted using Likert-scale of 11 ranging from "0 = extremely unlikely" to "10 = extremely likely" (Park and Lee (2009); Parry, et al (2012). Virtual word-of-mouth was adopted using a Likert-scale of 11 ranging from "0 = extremely unlikely" to "10 = extremely likely" (Hsu, et al., (2007); Hung, et al. (2003). External influence, Subjective norm, and Perceived behavioral control were adopted using a Likert-scale of 7 where responses varied between "strongly agree" and "strongly disagree" (Hair Jr. et al, (2010). The intention-to-use scale was adopted using a Likert-scale of 5 where responses varied between "strongly agree" and "strongly disagree" (Little, 1998).

Demographic analysis showed that more than half of the participants, 53.6% had undergraduate degrees. Only 4.3% had high school degrees; and only 3.9% of the participants were between 17 to 19 years old. Participants aged between 20 and 30 years old comprised about 69.5% of all participants. Almost two-third (61.4%) of participants were female. More than one-third of the participants were working full-time; 38.2% of them had one or more part-time jobs; and 28.9% of the participants did not have any work experience. Table 1 presents the demographics of all participants as well as separate details for USA and NZ.

Table 1: Demographic Analysis (N=233)

Education	**% (0.4M)**	**USA% / NZ%**		**Employment**	**% (0.4M)**	**USA% / NZ%**
High School	4.3	2.1 / 15		*Not employed*	27.9	24.9 / 42.5
Some College	24	28.5 / 2.5		*One part-time*	33.5	33.2 / 35
Undergraduate	53.6	56.5 / 40		*Two/more part-time*	4.7	5.2 / 2.5
Graduate/Post	18	13 / 42.5		*Full-time*	33.9	36.8 / 20
Age	**% (0.8M)**	**USA% / NZ%**		**Gender**	**% (0.8M)**	**USA% / NZ%**
17-19+ years	3.9	0.5 / 20		*Male*	38.6	387.8 / 42.5
20-24+ years	39.5	42.5 / 25		*Female*	61.4	62.2 / 57.5
25-29+ years	30	29.5 / 35		**Country**	**%**	
30-39+ years	17.6	18.7 / 12.5		*USA*	82.8	
40 and above	8.6	8.8 / 7.5		*NZ*	17.2	

Note: Columns with "USA% / NZ%" show the actual percentage of respondents from the two countries. For example, while 4.3% of all respondents (10 individuals out of 233) have completed a high school education program, 2.1% of participants (4 individuals) from USA and 15% of participants (6 individuals) in NZ were high school graduates.

Data Analysis

Prior to analysis, responses were controlled for missing data. Responses where participants left the survey early, such as not going further than a few questions relating to demographics, were removed from the data file. A small number of records (3 records) with more than 10% missing values were deleted from the dataset (Fornell and Larcker (1981). Little's 'missing completely at random (MCAR) test' (Kock, 2014) was applied to check the randomness of the missing values for the remaining records. Non-significant results (p=0.851 with Chi-Square = 1225.532, df = 1278) of the test indicated that the missing values were random. Following that, Expectation-Maximisation (EM) method was used for data imputation. A total of 233 responses, 40 from New Zealand and 193 from USA were included in the final analysis.

Data analysis was conducted using SPSS 25 and WarpPLS Version 6. The proposed conceptual model was tested using Partial Least Square (PLS) method, a second generation multivariate analysis (Fornell and Larcker (1981). PLS is a Structural Equation Modeling (SEM) based technique. While both techniques can measure the multivariate models with path coefficients simultaneously (Kock, 2014), each technique has advantages over the other under certain conditions. PLS is a variance-based technique allowing to test theoretical and measurement models at the same time (Chin et al, 2003). PLS works well with a small sample size than covariance-based SEM (Chin and Newsted (1999), and without the assumption of normality (Chin (1998); Urbach and Ahlemann (2010). In addition, PLS can be used for both confirming and developing theories (Urbach and Ahlemann (2010).

Common method bias (CMB) is a regular problem in social sciences occurring when researchers collect the data,

usually through survey studies (Kock, 2015), for predictor and criterion variables from the same source (Podsakoff et al, 2003). Full collinearity variance inflation factors (VIFs), a conservative approach is recommended for variance-based analysis for testing CMB (Kock (2015); Kock and Lynn (2012). Values of VIF less than 3.3 indicate no threat for CMB. Our results show that average full collinearity VIF was 2.268 with values ranging between 1.77 and 2.904 indicating no threat of CMB in the study.

Table 2: Confirmatory Factor Analysis, Reliability Measures, and Sources of the Adopted Scales

	ResDem	Image	EoU	RelAdv	pWoM	eWoM	SubNorm	ItU	ExtInf	PBehCo	Cronbach's Alpha	Composite Reliability	Source
ResDem1	0.872	0.027	0.058	-0.186	-0.015	0.029	0.002	-0.042	-0.036	0.168	0.840	0.904	Moore& Benbasat (1991)
ResDem2	0.920	-0.050	-0.093	0.005	0.072	-0.019	0.056	-0.137	-0.020	0.038			
ResDem3	0.819	0.027	0.043	0.193	-0.065	-0.009	-0.066	0.199	0.061	-0.221			
Image1	0.019	0.936	0.016	0.035	0.063	-0.045	0.032	0.004	-0.024	-0.019	0.931	0.956	Moore& Benbasat (1991)
Image2	0.032	0.951	-0.057	-0.025	0.014	-0.014	0.028	-0.057	-0.005	0.051			
Image3	-0.053	0.925	0.042	-0.010	-0.078	0.060	-0.061	0.055	0.030	-0.033			
EoU1	-0.095	-0.059	0.873	0.070	-0.064	0.227	-0.079	-0.001	0.076	-0.026	0.911	0.938	Moore& Benbasat (1991)
EoU2	0.049	0.033	0.901	0.010	-0.015	-0.073	-0.013	0.089	0.081	-0.164			
EoU3	-0.028	-0.013	0.912	0.173	0.083	-0.139	-0.030	-0.102	-0.018	0.004			
EoU4	0.074	0.040	0.868	-0.262	-0.007	-0.008	0.125	0.015	-0.142	0.193			
RelAdv1	0.007	-0.009	0.013	0.922	0.055	-0.002	-0.009	-0.040	0.004	-0.041	0.962	0.971	Moore& Benbasat (1991)
RelAdv2	0.008	0.050	-0.002	0.932	0.000	0.003	-0.055	0.028	0.076	-0.018			
RelAdv3	0.008	-0.010	-0.081	0.937	-0.013	-0.001	-0.029	-0.003	0.015	0.017			
RelAdv4	-0.004	-0.036	0.065	0.950	0.031	-0.063	0.021	-0.062	-0.056	0.030			
RelAdv5	-0.020	0.006	0.004	0.921	-0.075	0.066	0.072	0.078	-0.039	0.011			
PWoM1	-0.054	0.018	0.023	-0.021	0.868	-0.016	0.017	0.257	0.085	-0.090	0.888	0.931	Maxham (2001); Parry et al. (2012)
PWoM2	0.055	-0.005	0.059	0.040	0.927	0.001	-0.090	-0.055	-0.047	-0.007			
PWoM3	-0.005	-0.012	-0.082	-0.021	0.917	0.014	0.075	-0.187	-0.033	0.092			
VWoM1	-0.172	-0.157	-0.026	0.067	0.333	0.726	0.342	-0.116	-0.067	0.172	0.894	0.923	Park & Lee (2009); Parry et al. (2012)
VWoM2	-0.094	-0.095	0.052	0.131	0.057	0.869	-0.175	-0.136	0.044	0.205			
VWoM3	-0.095	-0.079	0.117	0.007	-0.054	0.871	-0.104	-0.152	0.105	0.194			
VWoM4	0.135	0.136	-0.072	-0.036	-0.130	0.877	-0.018	0.135	-0.066	-0.242			
VWoM5	0.201	0.172	-0.077	-0.162	-0.154	0.846	0.012	0.256	-0.027	-0.307			
SbNorm1	0.045	-0.089	0.024	0.114	0.014	0.032	0.901	-0.059	0.028	0.066	0.924	0.952	Hung et al. (2003)
SbNorm2	0.014	0.058	-0.029	-0.017	0.018	-0.023	0.950	-0.064	-0.006	-0.059			
SbNorm3	-0.057	0.027	0.006	-0.092	-0.032	-0.008	0.943	0.120	-0.021	-0.004			
ItU1	-0.056	-0.004	-0.044	0.053	-0.086	0.120	0.068	0.900	0.039	0.144	0.911	0.944	Hsu et al. (2006)
ItU2	0.018	-0.030	0.039	0.018	0.044	-0.047	-0.010	0.942	-0.028	-0.087			
ItU3	0.036	0.035	0.003	-0.071	0.039	-0.069	-0.056	0.922	-0.009	-0.052			
ExtInf1	0.038	-0.049	0.053	-0.052	0.081	-0.048	0.001	-0.154	0.902	0.009	0.869	0.920	Hung et al. (2003)
ExtInf2	0.111	0.022	-0.049	-0.194	-0.083	0.104	-0.010	0.058	0.902	0.062			
ExtInf3	-0.156	0.029	-0.005	0.256	0.002	-0.059	0.010	0.100	0.865	-0.074			
PBehCo1	-0.042	0.075	0.049	0.027	0.053	-0.021	-0.031	-0.064	0.090	0.919	0.815	0.915	Hung et al. (2003)
PBehCo2	0.042	-0.075	-0.049	-0.027	-0.053	0.021	0.031	0.064	-0.090	0.919			

Note:

ResDem: Result demonstrability	**RelAdv:** Relative Advantage	**ExtInf:** External influence	**ItU:** Intention- to-use
Image: Image	**pWOM**: Personal Word-of- Mouth	**SubNorm:** Subjective norm	
EoU: Ease of use	**eWOM**: Virtual Word-of-Mouth	**PBehCo:** Perceived behavioral control	

As part of establishing the measurement model, a set of validity and reliability tests were conducted. Validity tests conducted include convergent and discriminant validity. Factor analysis and average variance extracted (AVE) values are two commonly used techniques for testing validity (Rubio et al (2001). Factors loading onto one factor only with a value larger than 0.5 and AVE values greater than 0.5 indicate good convergent validity (Hair et al. (2010). Our results indicate good discriminant validity with all items loading onto one factor, without cross-loading, with the smallest loading value of 0.726 (see Table 2). The AVE values found in the analysis are higher than 0.5 (see Table 3).

Reliability measures are used for testing internal consistency of the indicators within a latent variable. Two reliability measures are commonly used: Cronbach's alpha and composite reliability. Cronbach's alpha value higher than 0.7 is required. The rule of thumb for the composite reliability is higher than 0.7 indicating good reliability (Nunnally and Bernstein, 1994). Our results indicate good reliability as both Cronbach's alpha and composite reliability measures are higher than 0.7 (see Table 2). On the other hand, reliability values higher than 0.95 may indicate common method bias (Straub et al, 2004). However, VIF values lower than 3.3 would eliminate this risk of CMB (Kock and Lynn, 2012). Therefore, with low CMB and reliability scores higher than 0.7, the results of this data analysis indicate a good internal consistency for the measures.

All the constructs tested in the model are positively and significantly correlated with each other (see Table 3). The correlations vary between 0.239 (Results Demonstrability and Image), and 0.688 (Relative Advantage and Intention to Use). In Table 3, the values in diagonal represent the square root of AVE values. Good discriminant validity requires the square root of AVE values to be greater than any correlation in relation to the construct. In other words, the value in parenthesis must be bigger than any correlation in the same row or column. As the table shows, all square root of AVE values satisfy this requirement; therefore, indicating good discriminant validity. In addition, VIF values for the constructs (1.994 for Result Demonstrability, 2.889 for Relative Advantage, 2. 482 for External Influence, 2.904 for Intention-to-Use, 1.903 for Image, 2.292 for Personal Word-of-Mouth, 2.621 for Subjective Norm, 1.840 for Ease-of-Use, 1.984 for Virtual Word-of-Mouth, and 1.770 for Perceived Behavioral Control) were less than the threshold value of 3.3 for variance-based SEM analysis (Cenfetelli and Bassellier, 2009; Kock, 2014). This indicates that multi-collinearity is not present in the study.

Table 3: Correlations and AVE Value (in diagonal and parentheses**)**

	RDem	Image	EoU	RAdv	pWoM	eWoM	SNorm	ItU	ExInf	PBCo
RDem	(0.871)									
Image	0.239	(0.937)								
EoU	0.601	0.327	(0.889)							
RAdv	0.487	0.542	0.520	(0.933)						
pWoM	0.361	0.495	0.357	0.457	(0.904)					
eWoM	0.534	0.239	0.446	0.408	0.587	(0.840)				
SNorm	0.295	0.611	0.382	0.629	0.492	0.274	(0.932)			
ItU	0.333	0.486	0.379	0.688	0.577	0.354	0.667	(0.921)		
ExtInf	0.333	0.554	0.383	0.666	0.528	0.372	0.687	0.635	(0.890)	
PBCo	0.497	0.354	0.474	0.513	0.375	0.406	0.382	0.539	0.395	(0.919)

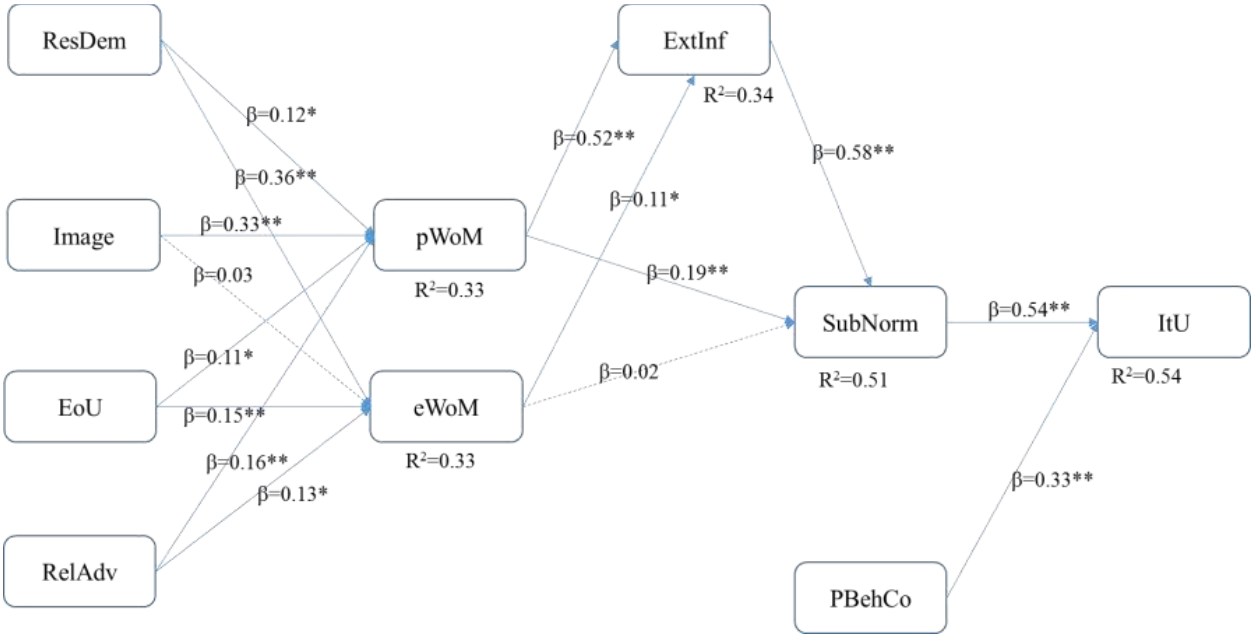
RESULTS

After satisfying the requirements of the measurement model, the structural model was tested. Figure 1 below demonstrates the conceptual model of the study. The results of the PLS analysis show that Result Demonstrability (β=0.12, $p<0.05$), Image (β=0.33, $p<0.01$), Ease of Use (β=0.11, $p<0.05$) and Relative Advantage (β=0.16, $p<0.01$) are positively and significantly associated with Personal Word-of-Mouth and all except Image with Virtual Word-of-Mouth (β=0.36, $p<0.01$; β=0.15, $p<0.01$; β=0.13, $p<0.05$, respectively).

While both Personal Word-of-Mouth (β=0.52, $p<0.01$) and Virtual Word-of-Mouth (β=0.11, $p<0.05$) are positively and significantly associated with External Influence, External Influence is significantly associated with Subjective Norm (β=0.58, $p<0.01$) as well. Personal Word-of-Mouth (β=0.19, $p<0.01$) had positive association with Subjective

Norm but the association between Virtual Word of Mouth and Subjective Norm was not significant. Finally, both Subjective Norm (β=0.54, p<0.01) and Perceived Behavioral Control (β=0.33, p<0.01) had positive and significant association with Intention to Use (see Figure 1). The variance explained for External Influence, Personal Word-of-Mouth, Virtual Word-of-Mouth, Subjective Norm and Intention-to-Use are 0.34, 0.33, 0.33, 0.51, and 0.54, respectively.

Figure 1: Conceptual Model of the Study and the Path Coefficients



In PLS analysis, there is no globally accepted fit indices (Urbach and Ahlemann, 2010). However, different fit indices can be reported for PLS analysis. In this regard, average path coefficient (APC), average R-squared (ARS), and average adjusted R-square (AARS) are commonly used model with indices. The results show good model fit with 0.244 (p<0.001) for APC, 0.410 (p<0.001) for ARS, and 0.402 (p<0.001) for AARS. Additional measures of GoF at 0.579 (Tenenhaus et al., (2005) supports the model fit by being over 0.36, the "large effect size of R^2" (Wetzels, 2009).

DISCUSSION

This paper examined how interaction behaviors (personal word-of-mouth and virtual word of mouth) can give rise to or modify subjective norms that are known to affect user intention to adopt an innovation. Analyzing data collected from 233 college students regarding an interactive/sharing technology popular among their cohort, the results indicate that Personal word-of-mouth and Subjective Norm are positively and significantly related; but the association between Virtual word-of-mouth and Subjective Norm was not significant. In addition, innovation attributes (Result Demonstrability, Image, Ease-of-Use and Relative Advantage) are positively and significantly associated with Personal word-of-mouth; and all attributes except Image are positively and significantly associated with Virtual word-of-mouth. This discovery relating to Image, Subjective Norm, and Virtual word-of-mouth was surprising and deserves further study.

Given that Personal word-of-mouth implicates co-presence and evokes immediacy and synchronicity lacking in Virtual word-of-mouth, its positive association with Subjective Norms stands to reason since it predicates the user as an active agent located within a context, and registering and responding to environmental actors and forces. For the same reason, it is also plausible that Image, defined as "the degree to which use of an innovation is perceived to enhance one's image or status in one's social system" (Moore and Benbasat, 1991), would not have significant association with virtual word-of-mouth. Lacking the adapting and adjustable attitude-knowledge developments of co-present interactivity, image would not matter in virtual word-of-mouth as much as it would in personal word-of-mouth contexts.

From a theoretical perspective, the findings reported in this article extend our understanding of the relationship between subjective norms and innovation adoption in important ways. First, existing research has focused on subjective norms as internal to an individual, a psychological construct formed of beliefs about how important others think the individual should act or behave. The present study fills a gap in the literature by making explicit a dynamic by which subjective norms may be co-created or modified to affect user intention or action towards an innovation. This leads us to state that subjective norms are more than beliefs about what important others think, more than an isolate antecedent to user adoption. Subjective norms are more akin to adjustments in attitude-knowledge arising from communication, negotiation, and interaction. The insights offer notable guidance for information system and general management instruction on change planning and change management.

Information technology and system changes, big and small, need to be planned and managed, as it is done for any successful change implementation. The affected human users need to be considered in the planning, and consulted because 'the client' is not simply the innovative tool or computing capabilities. Therefore, instructors in information technology management and general management need to consider including a stand-alone lesson on change management given its importance in change implementation. This research might be used in the course content in many ways such as a class discussion topic, a group project, or as part of the required reading material to extend student understanding.

Social interactions are an important dimension in the workings of individual choice and even in workplace culture, by creating inter-subjectivity among people when they can agree (mostly or even partially) on a given set of meanings or definition of a situation or issue, in this case an interactive-sharing technology's use intention and perceived innovation attributes. It is also a fact that social interactions may be positive or negative. To encourage user intention and organizational support for innovation adoption, firms may plan, prepare, manage and affect professional development interactions in the workplace especially during training. Included in the university curriculum, students would learn that change management, especially in information technology solutions and systems could not happen by fiat or assumption.

For business managers planning information systems changes, the paper highlights the importance of why they may wish to consider an interpersonal view of subjective norms as it affects organizational systems and how they may go about its implementation. A framework representing four generic (non-mutually exclusive) strategies – observer, moderator, mediator, and participant may be considered by a firm to implement a new technology and to influence social interactions for its effective use (Godes et al. 2005). This framework may also be included in the change management instructional module for the classroom. By viewing subjective norms as located in interactive processes, firms and students can better understand the unique ways in which organizational members tend to perceive, expand, and even transform their attitude-knowledge of innovation use.

The exclusion of Image in Virtual word-of-mouth was notable in the study results. Had subjective norms been simply the direct effect of social influence on user intention, or simply an individual's belief about the influence of important others – as mentioned in the literature -- prestige enhancement within the organization or social circle would have had significant association in virtual word-of-mouth as it did in personal word-of-mouth, much like the other innovation attributes. Even though the innovation in this study is an exclusive wearable digital interactive-sharing technology, its potential to improve user image did not affect user intention in virtual word-of-mouth. This finding has implications for many communities particularly in health-care and finance.

Limitations and Directions for Future Research

The conclusions of this study must be qualified by its limitations. Data were collected from a cross-section sample and could not be used to establish causal relationships. Furthermore, the study focused on a personal sharing technology that was gaining acceptance and receiving media attention. It is possible also that some of the findings might not apply to other sharing technologies and product categories. For managers in compliance workplace settings, the findings might help to explain why their companies have problems when introducing information systems into their business processes, and what might be done to address them. The current view of subjective norms as beliefs and perceptions comprising other's expectations does not quite help explain organizational inertia or how it might be countered. Neither does it help understand individual discretion to not use or use select features of innovations in the workplace. Thus, one line of future research might examine how subjective norms viewed as attitude-knowledge arising in interaction and negotiated understanding, become amenable to creation and modification through personal word-of-mouth as well as other promotion approaches that may increase perceived behavioral control and innovation use intention.

REFERENCES

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes.* Vol 50, No. 2, pp 179–211.

Andreas, E., Sven, L. and Tim, W. (2009). Who Influences Whom? Analyzing Workplace Referents' Social Influence on IT Adoption and Non-Adoption. *Journal of Information Technology.* Vol. 24, No. 1, pp 11-24.

Bagozzi, R. (2007). The Legacy of the Technology Acceptance Model and a Proposal for a Paradigm Shift. *Journal of the Association for Information Systems.* Vol 8, No. 4, pp 244-254.

Bayerl, P.S., Lauche, K. and Axtell, C. (2016). Revisiting Group-Based Technology Adoption as a Dynamic Process: The Role of Changing Attitude-Rationale Configurations. M*IS Quarterly,* Vol. 40, No. 3, pp. 775-784.

Bearden, W.O. and Etzel, M.J. (1982). Reference Group Influence on Product and Brand Purchase Decisions. *Journal of Consumer Research,* Vol. 9, No. 2, pp. 183-194.

Bhattacherjee, A., & Lin, C. P. (2015). A unified model of IT continuance: three complementary perspectives and crossover effects. *European Journal of Information Systems*, Vol. 24, No. 4, pp. 364-373.

Cenfetelli, R. and Bassellier, G. (2009). Interpretation of Formative Measurement in Information Systems Research. *MIS Quarterly.* Vol. 33, No. 4, pp. 689-708.

Chin, W. (1998). Issues and Opinion on Structural Equation Modelling. *MIS Quarterly.* Vol. 22, No. 1, pp.7-16.

Chin, W.W. and Newsted, P.R. (1999). "Structural Equation Modeling Analysis with Small Samples Using Partial Least Squares" in Hoyle, R. (Ed.), *Statistical Strategies for Small Sample Research*, Sage Publications, Thousand Oaks, CA.

Chin, W.W., Marcolin, B.L. and Newsted, P.R. (2003). A Partial Least Squares Latent Variable Modeling Approach for Measuring Interaction Effects: Results from a Monte Carlo Simulation Study and Voice Mail Emotion/Adoption Study. *Information Systems Research.* Vol. 14, No. 2, pp. 189-217.

Cialdini, R.B. and Goldstein, N.J. (2004). Social Influence: Compliance and Conformity. *Annual Review of Psychology.* Vol. 55, pp. 591-621.

Davis, F.D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly.* Vol. 13, No. 3, pp. 319-340.

Devaraj, S., Easley, R.F., and Crant, J.M. (2008). How Does Personality Matter? Relating the Five-Factor Model to Technology Acceptance and Use. *Information Systems Research.* Vol. 19, No.1, pp. 93-105.

Dwivedi, Y.K., Rana, N.P, Jeyaraj, A., Clement, M. and Williams, M.D. (2017). Re-examining the Unified Theory of Acceptance and Use of Technology: Towards a Revised Theoretical Model. *Information Systems Frontiers.* Vol. 21, No. 3, pp. 719–734.

Eckhardt, A., Laumer, S., & Weitzel, T. (2009). Who Influences Whom? Analyzing Workplace Referents' Social Influence on it Adoption and Non-Adoption. *Journal of Information Technology.* Vol. 24, No. 1, pp. 11–24.

Fishbein, M. (1967). "Attitude and the Prediction of Behavior," in Fishbein, M. (Ed.), *Readings in Attitude Theory and Measurement,* Wiley, New York, NY.

Fishbein, M. and Ajzen, I. (1975). *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research.* Addison-Wesley, Reading, MA.

Fornell, C., and Larcker, D.F. (1981). "Structural Equation Models with Unobservable Variable and Measurement Error: Algebra and Statistics. *Journal of Marketing Research*. Vol. 18, Issue 3, pp. 382-388.

Godes, D., Mayzlin, D., Chen, Y., Das, S., Dellarocas, C., Pfeiffer, B., Libai, B., Sen, S., Shi, M. and Verlegh, P. (2005). The Firm's Management of Social Interactions. *Marketing Letters.* Vol. 16, No. 3/4, pp.415-28.

Graf-Vlachy, L., Buhtz, K., & König, A. (2018). Social influence in technology adoption: taking stock and moving forward. *Management Review Quarterly*. Vol. 68, No. 1, pp. 37–76.

Hair Jr., J.F., Black, W.C., Babin, B.J., and Anderson, R.E. (2010). *Multivariate Data Analysis: A Global Perspective* (7th Edn), Pearson Education, Upper Saddle River, NJ.

Hardie, B. G. S., Robertson, T. S., & Ross, W. T. (1996). Technology Adoption: Amplifying versus Simplifying Innovations. *Marketing Letters*. Vol. 7, Issue 4, pp. 355–369.

Herbjørn, N., Pedersen, P.E., and Thorbjørnsen, H. (2005). Intentions to Use Mobile Services: Antecedents and Cross-Service Comparisons. *Journal of the Academy of Marketing Science.* Vol. 33, No. 3, pp.330-346.

Hung, S-Y., Ku, C-Y., and Chang, C-M. (2003). Critical Factors of WAP Services Adoption: An Empirical Study. *Electronic Commerce Research and Applications.* Vol. 2, No. 1, pp. 42-60.

Hsu, C.L., Lu, H.P., and Hsu, H.H. (2007). Adoption of the Mobile Internet: An Empirical Study of Multimedia Message Service (MMS). *Omega*. Vol. 35, No. 6, pp. 715-726.

Irimia-Diéguez, A., Velicia-Martín, F., & Aguayo-Camacho, M. (2023). Predicting Fintech Innovation Adoption: the Mediator Role of Social Norms and Attitudes. *Financial Innovation (Heidelberg)*. Vol. 9 No. 1, pp. 36–36.

Kock, N. (2014). Advanced Mediating Effects Tests, Multi-Group Analyses, and Measurement Model Assessments in PLS-based SEM. *International Journal of e-Collaboration.* Vol. 10, No. 3, pp. 1-13.

Kock, N. (2015). Common Method Bias in PLS-SEM: A Full Collinearity Assessment Approach. *International Journal of e-Collaboration.* Vol. 11, No. 4, pp. 1-10.

Kock, N. and Lynn, G.S. (2012). Lateral Collinearity and Misleading Results in Variance-Based SEM: An Illustration and Recommendations. *Journal of the Association for Information Systems.* Vol. 13, No. 7, pp. 546-580.

Legris, P., Ingham, J., & Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information & Management*. Vol. 40, No. 3, pp. 191–204.

Little, R.J. (1988). A Test of Missing Completely at Random for Multivariate Data with Missing Values. *Journal of the American Statistical Association.* Vol. 83, No. 404, pp.1198-1202.

Maxham III, J.G. (2001). Service Recovery's Influence on Consumer Satisfaction, Positive Word-Of-Mouth, and Purchase Intentions. *Journal of Business Research.* Vol. 54, No. 1, pp.11-24.

Moore, G.C. and Benbasat, I. (1991). Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation. *Information Systems Research.* Vol. 2, No.3, pp.192-222.

Morwitz, V. (1997). Why Consumers Don't Always Accurately Predict Their Own Future Behavior. *Marketing Letters.* Vol. 8, No. 1, pp. 57-70.

Nunnally, J.C. and Bernstein, I.H. (1994). *Psychometric theory.* McGraw-Hill, New York, NY.

Parry, M.E., Kawakami, T., and Kishiya, K. (2012). The Effect of Personal and Virtual Word-Of-Mouth on Technology Acceptance. *Journal of Product Innovation Management.* Vol. 29, No. 6, pp.952-966.

Park, C. and Lee, T.M. (2009). Information Direction, Website Reputation and eWOM Effect: A Moderating Role of Product Type. *Journal of Business Research.* Vol. 62, No.1, pp. 61-67.
Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology.* Vol. 8, No. 5, pp. 879–903.
Rosli, M. S., Saleh, N. S., Md. Ali, A., Abu Bakar, S., & Mohd Tahir, L. (2022). A Systematic Review of the Technology Acceptance Model for the Sustainability of Higher Education during the COVID-19 Pandemic and Identified Research Gaps. *Sustainability*. Vol. 14, No. 18, 11389-.
Rubio, D.M., Berg-Weger, M., and Tebb S.S. (2001). Using Structural Equation Modeling To Test For Multidimensionality. *Structural Equation Modeling.* Vol. 8, No. 4, pp. 613–626.
Schepers, J. and Wetzels, M. (2007). A Meta-Analysis of the Technology Acceptance Model: Investigating Subjective Norm and Moderation Effects. *Information & Management.* Vol. 44, No.1, pp. 90-103.
Straub, D., Boudreau, M.C., and Gefen, D. (2004). Validation Guidelines for IS Positivist Research. *Communications of the Association for Information Systems.* Vol. 3, No.1, pp. 24.
Taylor, S. and Todd, P. (1995). Understanding Information Technology Usage: A Test Of Competing Models. *Information Systems Research*. Vol. 6, No. 2, pp. 144-176.
Tenenhaus, M., Vinzi, V.E., Chatelin, Y.M., and Lauro, C. (2005). PLS Path Modeling. *Computational Statistics & Data Analysis.* Vol. 48, No. 1, pp. 159-205.
Titah, R. and Barki, H. (2009). Nonlinearities between Attitude and Subjective Norms in Information Technology Acceptance: A Negative Synergy? *MIS Quarterly.* Vol. 33, No. 4, pp. 827-844.
Urbach, N. and Ahlemann, F. (2010). Structural Equation Modeling in Information Systems Research Using Partial Least Squares. *Journal of Information Technology Theory and Application.* Vol. 11, No. 2, pp. 5-40.
Venkatesh, V. and Davis, F.D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science.* Vol. 46, No.2, pp. 186-204.
Venkatesh, V. and Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Interventions. *Decision Sciences.* Vol. 39, No.2, pp. 273-315.
Venkatesh, V., Morris, M.G., Davis, G.B., and Davis, F.D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly.* Vol. 27, No.3, pp. 425-478.
Venkatesh, V., Thong, J., and Xu, X. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly.* Vol. 36, No.1, pp. 157-178.
Wetzels, M., Odekerken-Schroder, G., van Oppen, C. (2009). Using PLS Path Modeling for Assessing Hierarchical Construct Models: Guidelines and Empirical Illustration. *MIS Quarterly.* Vol. 33, No. 1, pp. 177-196.

Nazim Taskin (PhD) is an Associate Professor in the Management Information Systems Department, Bogazici University, Istanbul, Turkiye. Prior to this, Dr. Taskin was a Senior Lecturer at School of Management, Massey University, New Zealand. He holds a PhD in Interdisciplinary Studies from University of British Columbia, Okanagan, Canada. Dr Taskin is an Associate Editor at Journal of Modelling in Management in Big Data and Business Analytics area and the Academic Editor at PLOS ONE. Highly published in several top journals, he has co-authored a book and two book chapters as well.

Sweety Law (PhD) is a Professor in the Department of Marketing at California State University East Bay, USA. Highly published in top journals including Journal of Communication, Journal of Workplace Learning, International Journal of Information Systems and Supply Chain Management, Active Learning in Higher Education, and Journal of Business Leadership, she has co-authored three book chapters as well.

Jacques Verville is a retired Professor of Management Information Systems. He holds a PhD in Administrative Science - Organizational Information Systems, Laval University; an MA in International Relations from Syracuse University; a MSc in Information Management Syracuse University and a BA in Linguistics and French Literature from the University of Alberta. Highly published in a number of journals including International Business Review; Decision Support Systems; IEEE Transaction of Professional Communications; Decision Sciences Journal of Innovative Education; Industrial Marketing Management; Journal of Enterprise Information Management; International Journal of Technology Management; and Journal of Information Science, he is also co-author of Acquiring Enterprise Software: Beating the Vendors at their Own Game.

Evaluating the Liquidity of Retailers Terminating Operations: Lessons to Take to the Classroom

Martin Gosman, Wesleyan University, Middletown CT, USA
Mathius Gazi, Wesleyan University, Middletown CT, USA
Liam Kennedy, Wesleyan University, Middletown CT, USA
Sophia Lindus, Wesleyan University, Middletown CT, USA

ABSTRACT

Although firms that go defunct usually have precarious liquidity situations, how often do the financial ratios highlighted in accounting and finance textbooks provide a warning sign? To address this issue, eighteen retailers that issued their last 10-Ks for fiscal years 2007 through 2018 are matched with similar retailers that continued in business. Little differentiation is seen when current ratios are compared for both sets of firms, as many about-to-be defunct firms continue to report very respectable current-ratio levels. On the other hand, the two sets of firms are clearly distinguished from one another when the focus turns to a cash-oriented liquidity measure, specifically the operating cash flow ratio. In contrast to their surviving peers, the defunct firms reported little if any operating cash in their last 10-K. Cash is what a firm uses to pay its bills, and the current assets of accounts receivable and inventory do not provide a direct substitute for cash when a firm faces a liquidity crises. In a teaching note that follows, students examine whether warning flags were sent up by the two liquidity measures in nine recent retailer bankruptcies and address discussion questions that enable them to revisit key points raised in the case.

Keywords: financially challenged firms, liquidity analysis, current ratio, operating cash flow ratio

INTRODUCTION

Classroom discussions centered around measuring a firm's short-term liquidity always include a focus on its current ratio (current assets/current liabilities). Current assets are cash and items such as accounts receivable and inventory that will bring in cash within the upcoming year. Current liabilities are obligations that require the use of cash within the next year or require the firm to provide goods or services in the future for which payment has already been received.

It might seem that the greater the ratio of current assets to current liabilities, the greater the firm's ability to meet its short-term obligations -- and thus remain in business. In fact, this viewpoint continues to be prevalent in many accounting and finance textbooks. However, this common-sense reasoning does not always bear fruit, for one observes anecdotally that the current ratio remains high for some retailers even in the last 10-K they filed before ceasing operations. To illustrate, current ratios from three retailers' last 10-Ks are presented in Table 1. Retailers were selected for study because many highly publicized bankruptcy filings and liquidations have occurred within that sector.

Table 1: Current Ratios Reported by Three Retailers in Their Last 10-Ks

Firm Name	Fred's	Pier 1 Imports	Stage Stores
Status	Defunct	Defunct	Defunct
Date of Last 10-K	2/2/2019	3/2/2019	2/2/2019
For Fiscal Year	2018	2018	2018
Current Ratio	1.47	1.76	2.78

As shown in Table 1, in early 2019 these three financially challenged retailers had current assets that exceeded their current liabilities by anywhere from 47% to 178%.

NATURE OF RESEARCH

This inquiry is intended to shed light on whether the above examples simply represent anomalies or do they, in fact, portray results that are more common than typically thought. If the latter is true, could an alternative liquidity measure better differentiate between firms that are becoming defunct and those likely to continue? In so, students will benefit from a discussion of how financial measures vary in their ability to spot precarious liquidity situations. Of course, the last 10-Ks are issued by firms becoming defunct, not those already defunct, but such firms are referred to here as defunct. Several of these retailers kept, or re-emerged with, an online presence but went defunct as a store-based retailer.

To aid an understanding of why firms such as Fred's, Pier 1, and Stage Stores became defunct despite admirably high current ratios, this paper considers whether a cash-oriented liquidity measure might better distinguish between retailers that cease operations and those that continue to operate. There is reason to believe this might be the case. A going concern must maintain an adequate investment in current assets. Funds tied up in accounts receivable and inventory can help create a high current ratio, but they are not readily available to pay off a firm's current liabilities. Thus a firm's short-term obligations usually must be paid with cash rather than through the liquidation of non-cash current assets.

Unlike the expectations for a start-up firm, well-established firms are expected to generate a lot of cash from operating activities and less, if any, cash from external financing. Accordingly, the cash-oriented liquidity measure selected for study is the **operating cash flow ratio**, rather than the firm's balance of cash. The ratio is calculated as follows:

Cash from Operations / Average Current Liabilities

RESEARCH QUESTIONS

1. In addition to Fred's, Pier 1, and Stage Stores, do many other defunct retailers report very respectable current ratios?

2. To what extent could the operating cash flow ratio prove superior to the current ratio at distinguishing between defunct retailers and continuing firms?

Operating cash flow data became more prominent following the accounting profession's requirement that firms begin presenting a statement of cash flows in 1988. That ruling was in large part prompted by the 1975 bankruptcy filing and rapid liquidation of W.T. Grant, a low-to-mid-priced department store with over 1,200 stores nationwide. The profession was chastised for its (then) focus on flows of working capital rather than flows of cash. Unsold inventory and uncollected accounts receivable totaled over $400 million each in Grant's last four years of existence, but with the focus on working capital rather than cash, these current assets contributed to current ratios that were no lower than 1.23 and usually exceeded 1.50 -- probably playing a role in the delayed recognition of the firm's precarious condition. If a statement of cash flows had been required then, Grant's would have disclosed that its operations *used up* approximately $100 million in cash during each of its final two years in business (Largay and Stickney, 1980).

SAMPLE DEVELOPMENT

For sample inclusion, retailers must have been publicly held, given the need to access data from 10-Ks filed with the SEC. Ratio levels of each retailer that issued its last 10-K during the 2007-2018 period were matched with a continuing firm. Because ratio levels do vary with the economy and between different lines of business, the following were held constant for each pair of firms:

1. Year of last 10-K filed by the firm that became defunct.
   and
2. Line of business, measured by their SIC (standard industrial classification number).

The 2007-2018 period was chosen because:

1. Any later starting point would have yielded far fewer sample firms.

2. Setting 2018 as the endpoint avoided inter-period comparability issues likely to result from:

   a. declines in retailers' current ratios that began in 2019 when firms were required to include many more lease obligations on their balance sheets.

   b. increases in retailers' current ratios beginning in 2020 as COVID's slowing of economic activity led to increased holdings of inventory.

Publicly held retailers that became defunct during the 2007-2018 period are listed in Table 2.

Table 2: Twenty-Six Defunct Publicly Held Retailers, 2007-2018

#	Defunct Firm	Year of Last 10-K	#	Defunct Firm	Year of Last 10-K
1	Circuit City	2007	14	Wet Seal	2013
2	Gottshalks	2007	15	American Apparel	2014
3	Linens 'n Things	2007	16	Hancock Fabrics	2014
4	Wilsons Leather	2007	17	Aeropostale	2015
5	Borders Group	2010	18	hhgregg	2015
6	Retail Ventures	2010	19	Bon-Ton Stores	2016
7	Coldwater Creek	2012	20	99 Cents Only Stores	2016
8	ALCO Stores	2013	21	Perfumania	2016
9	Cache	2013	22	Toys R Us	2016
10	dELiA's	2013	23	Destination Maternity	2018
11	Hastings Entertainment	2013	24	Fred's	2018
12	Radio Shack	2013	25	Pier 1 Imports	2018
13	Sport Chalet	2013	26	Stage Stores	2018

From this universe of twenty-six firms, eighteen firms (representing ten different lines of business) could be matched with a continuing retailer on year and SIC. These matched pairs of firms are shown in Table 3.

Table 3: Sample of 18 Defunct Retailers with Their Paired Continuing Retailers

Pair #	Defunct Retailer	Year of Last 10-K	SIC*	Paired Continuing Retailer
1	Circuit City	2007	5731	Best Buy
2	Gottschalks	2007	5311	Dillard's
3	Linens n' Things	2007	5700	Bed Bath & Beyond
4	Retail Ventures	2010	5331	PriceSmart
5	Coldwater Creek	2012	5621	Chico's
6	ALCO Stores	2013	5331	Dollar Tree
7	Cache	2013	5621	Ann, Inc.
8	dELiA's	2013	5961	Cato
9	Hastings Entertainment	2013	5735	Trans World Entertainment
10	Sport Chalet	2013	5940	Hibbett Sports
11	Wet Seal	2013	5621	Express
12	American Apparel	2014	5621	Gap
13	Aeropostale	2015	5600	Tilly's
14	Bon-Ton Stores	2016	5311	Kohl's
15	99 Cents Only Stores	2016	5331	Dollar General
16	Fred's	2018	5331	Five Below
17	Pier 1 Imports	2018	5700	Kirkland's
18	Stage Stores	2018	5651	Ross Stores

*5311 Department Stores (2 pair)	5700 Home Furniture & Furnishings (2 pair)
5331 Variety Stores (4 pair)	5931 Consumer Electronics (1 pair)
5600 Apparel and Accessory (1 pair)	5935 Records & Prerecorded Tapes (1 pair)
5621 Women's Clothing Stores (4 pair)	5940 Misc. Shopping Goods (1 pair)
5651 Family Clothing Stores (1 pair)	5961 Catalog & Mail Order (1 pair)

MINIMUM THRESHOLDS FOR LIQUIDITY MEASURES

For each liquidity measure examined, defunct and continuing firms are to be compared in terms of the frequency with which a minimum desired level of that ratio was attained. Some discretion must be taken because a literature search revealed major differences in what would constitute the minimum desired level for a particular ratio. For the current ratio, a few sources still cite the old rule-of-thumb of 2.00, but more cite levels between 1.00-1.50 (Fernando, 2024) and, therefore, the midpoint of that range, 1.25, will be used in this paper. For the operating cash flow ratio, some sources cite 100%. However, such a level is not achieved by any firm and is not needed as existing current liabilities (such as accounts payable) are usually replaced with new current liabilities, rather than being "paid off." One research paper (Jang and Ryu, 2004) does cite a more attainable and realistic goal of 40%, and that threshold will be used here.

FINDINGS

In Table 4, the eighteen defunct firms are compared with their paired continuing firms on the frequency with which they achieved the minimum desired ratio levels noted above.

Table 4: Extent to Which Minimum Desired Ratio Levels Were Met for Defunct vs. Continuing Firms

Ratio	18 Defunct Firms	18 Continuing Firms
Current Ratio		
At least 1.25	**67% of firms (12 of 18)**	**94% of firms (17 of 18)**
Median	1.64	1.94
Range	0.71 to 3.95	1.08 – 3.54
Operating Cash Flow Ratio		
At least 40%	**0% of firms (0 of 18)**	**78% of firms (14 of 18)**
Median	-26%	+65%
Range	-140% to +37%	+7% to +136%

Considered in light of the minimum desirable levels established based on a literature search, the worrisome liquidity situation of defunct retailers was:

1. not especially apparent when the current ratios were contrasted with those of the paired continuing firms.

2. very apparent when the operating cash flow ratios were contrasted with those of the paired continuing firms.

Although the median current ratio for continuing firms in Table 4 exceeded that of defunct firms, the 1.64 median for the latter shows no sign of a precarious liquidity situation. Medians for the operating cash flow ratio differed greatly: -26% for the defunct firms and +65% for the continuing firms. Only four defunct firms reported *any* cash from operations on the last 10-K filed with the SEC, whereas all eighteen continuing firms did report a positive cash from operations. Start-up firms are not expected to generate funds from operating activities, but cash from operations is expected of well-established firms.

Often the result of falling sales, poor receivables collection, excessive inventory, and inefficient operations, low or nonexistent cash from operations will provide challenges for a firm struggling to meet its current obligations. This lack of internally generated cash could compel the firm to rely on external financing, but a firm known to be financially challenged often will find it very difficult or impossible to raise new equity or debt capital.

POSSIBLE EFFECT OF UNMATCHED FIRMS

As noted above, eight of the twenty-six defunct firms could not be matched with continuing firms. If those firms had been included in the sample, might the Table 4 results have been different? To test this, the ratio results for those unmatched defunct firms were compared to those of the matched defunct firms and matched continuing firms. The results are shown in Table 5.

Table 5: Comparison of Sample Firms' Ratio Levels with Those of Unmatched Firms

Ratio	18 Matched Defunct Firms	8 Unmatched Defunct Firms	18 Matched Continuing Firms
Current Ratio			
At lease 1.25	**67% of firms (12 of 18)**	**63% of firms (5 of 8)**	**94% of firms (17 of 18)**
Median	1.64	1.90	1.94
Range	0.71 to 3.95	0.86 to 4.04	1.08 to 3.54
Operating Cash Flow Ratio			
At Least 40%	**0% of firms (0 of 18)**	**0% firms (0 of 8)**	**78% of firms (14 of 18)**
Median	-26%	-2%	65%
Range	-140% to +37%	-94% to +9%	7% to 136%

As seen above, ratio levels for the unmatched defunct firms were similar to the matched defunct firms. Therefore, had the unmatched firms been able to be matched, it is not likely that the takeaway from Table 4 would have changed.

WHY NOT AN ADDITIONAL LIQUIDITY METRIC?

When a substantial portion of current assets consists of inventory, the current ratio is suspect as a measure of a liquidity. In this case, analysts often calculate the **quick ratio**:

(Cash + Short-Term Investments +Accounts Receivable) / Current Liabilities

The quick ratio more conservatively measures liquidity by eliminating the firm's inventory. Certainly a firm's liquidity should never impress merely because of the existence of large inventories, especially if that firm has lost favor in the marketplace and is struggling to sell its merchandise in a timely manner. A measurement problem arises, however, when a firm facing financial challenges is also carrying large amounts of short-term investments, many accounts receivable and/or cash from "last-ditch" financing - three assets that still remain within the numerator when calculating the quick ratio. In these cases, the drop-off from the current to quick ratio can be relatively small, often obscuring the presence of large amounts of difficult-to-sell inventory and perhaps falsely suggesting a favorable liquidity situation.

A more direct way to measure the existence of slow-to-sell inventory is to calculate the **days' sales in inventory**:

Average Inventory / (Cost of Goods Sold/365)

In Table 6, defunct and continuing firms are contrasted in terms of terms of their days' sales in inventory. Inventory levels do vary by line of business, but recall that each pair of defunct and continuing firms was matched by SIC number. A DSI of no more than 60 days is usually considered desirable (Hayes, 2024). Longer than 60-day holding periods could reflect the sluggish sales experienced by many soon-to-be-defunct retailers. On the other hand, a higher DSI can occur at successful retailers when they agree to purchase merchandise earlier than needed in return for more favorable pricing and/or extended payment terms.

Table 6: Days' Sales in Inventory for Defunct vs. Continuing Firms (DSI)

Days' Sales in Inventory	18 Defunct Firms	18 Continuing Firms
60 days or less	**22% of firms (4 of 18)**	**28% of firms (5 of 18)**
Median	109 days	74 days
Range	38 to 207 days	39 to 227 days

As shown in Table 6, DSI did not sufficiently aid in differentiating between the defunct and continuing firms, as few firms in either group held inventory for sixty days or less.

SUMMARY AND TAKEAWAY

In Table 7, the current ratios previously provided in Table 1 for Fred's, Pier 1, and Stage Stores are (a) supplemented with operating cash flow ratio results for the three firms and (b) contrasted with the ratios reported by their matched continuing firms. These matched firms were included in the Table-4 results for all eighteen pairs of matched firms.

Table 7: Comparison of Liquidity Measures for Three Matched-Pair Retailers

Firm Name	Fred's	Five Below		Pier 1	Kirkland's		Stage Stores	Ross Stores
Status	**Defunct**	**Continuing**		**Defunct**	**Continuing**		**Defunct**	**Continuing**
Date of Last 10-K	2/2/2019	N.A.		3/2/2019	N.A.		2/2/2019	N.A.
Current Ratio	1.47	2.54		1.76	1.83		2.78	1.69
Operating Cash Flow Ratio	-42%	+88%		-39%	+24%		-23%	+105%

As was previously observed in Table 4, defunct firms were clearly differentiated from their matched continuing firms when the focus was on the operating cash flow ratio, but not so with the current ratio. As revealed in Table 7,

1. The operating cash flow ratio was as high as 105% and never was less than +24% for these continuing firms. On the other hand, it was negative for all three defunct firms, never exceeding a -23%. Not one about-to-be defunct firm generated any cash from operating activities – an acceptable occurrence for a start-up firm, but not acceptable for a well-established firm.

2. The current ratio was 1.47 or higher for all six firms. Stage Stores' current ratio exceeded that of its continuing-firm match (Ross Stores) by more than 1.00. Pier 1 and Kirkland's had practically identical current ratios. Even when the continuing firm's (Five Below) current ratio was much higher than its matched firm, the defunct firm (Fred's) still reported a very respectable current ratio of 1.47.

Despite its inability to differentiate between defunct and continuing firms, the current ratio will continue to be featured in textbooks and discussed in the classroom, in part because of tradition but also because it seems useful to learn if a firm has sufficient current assets to cover its current liabilities. However, for retailers that went defunct from 2007-2018, the operating cash flow ratio substantially outperformed the current ratio in differentiating between them and their continuing-firm counterparts. This is not unexpected because:

1. A firm needs cash to pay its bills.

2. A struggling firm that cannot generate operating cash may find its days numbered.

3. Inventory that could be difficult to sell and receivables that could be difficult to collect upon will "pump up" the current ratio but probably not help in meeting a struggling firm's looming obligations.

When financially challenged firms are evaluated, areas looked at in addition to liquidity include unsustainably high debt, frequent losses, poor management, and lost market share. But when an evaluation of a firm's liquidity becomes the focus and this subject is covered in the classroom, the operating cash flow ratio is worthy of a more prominent

role. A more prominent role, rather than the sole role. Explaining why the current ratio, because of what it measures, often fails to signal a precarious liquidity situation can serve as an effective springboard into appreciation of why the operating cash flow ratio, because of what it does measure, can often step in and provide a more accurate evaluation.

Many decades ago the following criticism was directed at auditors and educators:

> "Auditors and educators have not been emphasizing the cash flow statement. Auditing textbooks commonly include only ratios based on the balance sheet and income statement, with little or no discussion of cash flow ratios. The next generation of auditors needs to learn how to use cash flow ratios in audits because such measures are becoming increasingly important to the marketplace. Investors and others are relying on them," (Mills and Yamamura (1998).

Has the situation improved today? Definitely! But even today the current ratio often receives more attention in many textbooks and some class discussions than does the operating cash flow ratio. And the statement of cash flows (SCF) is almost always the last financial statement appearing in firms' 10-Ks. Perhaps this is understandable given that the SCF, although required beginning in 1998, still remains the newest required financial statement. However, its positioning could belie the important role that operating cash flows should play when evaluating firms' liquidity.

TEACHING NOTE

Student Audiences

Students should be comfortable with calculating the current ratio and the operating cash flow ratio. In addition, they should be able to search online for financial statements contained in firms' 10-Ks. This research study can serve as a review assignment near the end of an Introductory Accounting course or as part of a liquidity-analysis review in such courses as Intermediate Accounting, Financial Statement Analysis, and Corporate Finance.

Time Commitment

Most students should be able to examine this research study and complete the assignments shown below in under one hour, with twenty minutes to read/study the text and thirty minutes to address the discussion questions. A follow-up class conversation could take about twenty minutes, especially if students are prompted to defend their answers to the questions.

Questions for Assignment (*suggestions for class discussion follow each question and are in italics*)

1. Bankruptcy filings by publicly held retailers during the past few years included the following:

Retailer	Chapter 11 Filing	Bankruptcy Resolution
The Container Store	December 2024	Taken private by creditors in January 2025; No stores closed
Party City Holdco	December 2024	All stores scheduled to close
Big Lots	September 2024	Sold to Gordon Bros. Retail Partners; 500 of 900 stores closed
LL Flooring	August 2024	Acquired by F9, private equity firm; 205 of 424 stores closed
Conn's	July 2024	All 553 stores closed
Express	April 2024	Acquired by PHOENIX and 2 mall operators; Many stores closed
JOANN	March 2024	Taken private by creditors in April 2024; No stores closed
Bed Bath & Beyond	April 2023	All stores closed; Intellectual property acquired by Overstock
Tuesday Morning	February 2023	All stores closed in July 2023; Remains as e-tailer only

In the following table, for each of the four retailers for which data were not filled-in, access the firms' 10-Ks using the SEC's EDGAR site and complete the table. Note: Date shown is when the retailer filed its last 10-K, not the date

of its last fiscal-year disclosures: for example, the 10-K filed by Express on 3/31/2023 covered its fiscal year ending 1/28/2023.

Retailer	Last 10-K Filing Date	Current Ratio	Operating Cash Flow Ratio
The Container Store	5/28/2024	1.19	+24%
Party City Holdco	3/28/2024	0.39	-11%
Big Lots	4/18/2024	1.31	-29%
LL Flooring	3/1/2024	1.54	+12%
Conn's	4/18/2024	2.58	-15%
Express	3/31/2023		
JOANN	4/4/2023		
Bed Bath & Beyond	6/14/2023		
Tuesday Morning	9/8/2022		

Current and operating cash flow ratios for the retailers filing Chapter 11 during the past few years were as follows:

Retailer	*Last 10-K Filing Date*	*Current Ratio*	*Operating Cash Flow Ratio*
The Container Store	*5/28/2024*	*1.19*	*+24%*
Party City Holdco	*3/28/2024*	*0.39*	*-11%*
Big Lots	*4/18/2024*	*1.31*	*-29%*
LL Flooring	*3/1/2024*	*1.54*	*+12%*
Conn's	*4/18/2024*	*2.58*	*-15%*
Express	*3/31/2023*	*0.99*	*-28%*
JOANN	*4/4/2023*	*1.28*	*-14%*
Bed Bath & Beyond	*6/14/2023*	*0.44*	*-43%*
Tuesday Morning	*9/8/2022*	*1.29*	*-45%*

2. As reported earlier in Table 4, the great majority of the eighteen retailers that went defunct during 2007-2018 had respectable current ratios (above 1.25), but very little, if any, cash from operations. Were your findings for the nine retailers in Question 1 similar to those found for the retailers that went defunct in earlier years? Complete the schedule below to help facilitate your response.

Financial Measure	Defunct Firms, 2007-2018	Defunct Firms, 2022-2024
Current Ratio above 1.25	67% of firms (12 of 18)	
Operating Cash Flow Ratio at least 40%	0% of firms (0 of 18)	

As shown below, the findings in Question 1 for the nine more-recent defunct firms were very similar to those for the eighteen earlier defunct firms:

Financial Measure	*Defunct Firms, 2007-2018*	*Defunct Firms, 2022-2024*
Current Ratio above 1.25	*67% of firms (12 of 18)*	*56% of firms (5 of 9)*
Operating Cash Flow Ratio at least 40%	*0% of firms (0 of 18)*	*0% of firms (0 of 9)*

Once again, the frequent existence of respectable current ratios may obscure the challenging liquidity situations at about-to-be defunct firms. These challenges are much better communicated by the paucity – or most often the nonexistence -- of operating cash relative to average current liabilities.

3. Conn's current ratio of 2.58 exceeded that of every other recently defunct firms by over 1.00. Refer to Conn's 1/31/2024 balance sheet and identify the one account most responsible for this. If a quick ratio had been calculated for the firm, might that ratio also have misled analysts as to the firm's liquidity situation? Explain.

Included among Conn's current assets at 1/31/2024 were $419 million of customer accounts receivable. Those receivables represented the firm's largest current asset, even exceeding its huge inventory investment. They would be included within the quick ratio, as Conn's restricted cash, inventories, and prepaid expenses are the only current assets excluded. Conn's quick ratio (computable as 1.71), while lower than its current ratio, would still obscure a serious liquidity problem facing the firm. Fortunately, the firm's operating cash flow ratio of -15% does communicate the challenges it faced.

4. Assume you are the only accounting or finance major in a student group tasked with analyzing the liquidity of firms believed to be financially challenged. Members of your group have suggested the following approaches as to how to proceed:

    1. "It's been a tradition to focus on the current ratio since the beginning of modern-day accounting, so why should we do anything differently now?"

    2 "Huge inventories render the current ratio suspect in measuring liquidity, so let's focus on the quick ratio."

    3. "It doesn't matter which ratio we focus on, as long as we're consistent in our approach to each firm."

    4. "A firm needs cash to pay its bills, so let's just look at the cash amount on the balance sheet."

a. Critique the team members' four suggestions, describing any faults you see in them.

The following are representative of students' critiques of the team members' suggestions:

1. *Tradition can be good and comforting. Nevertheless, just because the current ratio has been at the pinnacle of liquidity analysis for eons, it does not follow that it remains the financial metric most suitable for that task. The W.T. Grant situation clearly illustrated that abundant current assets -- in the absence of cash from operations -- will not necessarily enable firms to meet their current obligations and remain in business. Diminished insights are likely to result if liquidity analysis is conducted without any reference to a firm's ability or inability to generate cash from operations.*

2. *Firm's facing financial challenges can be carrying substantial levels of accounts receivable, as was the case for Conn's (Question 3). When this occurs, the quick ratio can remain very respectable even after sizable inventory quantities have been excluded. Often -- even more so when a struggling retailer has loosened credit standards -- these receivables prove difficult to collect and are unlikely to aid in settling current obligations.*

3. *Although it is important to be consistent in one's analysis from firm to firm, when one uses flawed metrics in the analysis the liquidity picture that emerges could be very misleading.*

4. *More important than the firm's current cash balance is whether or not the firm remains able to generate cash from its operating activities. On occasion, struggling firms will still report a notable balance of cash and cash equivalents. But lacking the ability to generate cash from internal operations, that cash balance is unlikely to remain or prevent the firm from ceasing operations. For example, on their final 10-Ks Pier 1, Aeropostale, Retail Ventures, and Circuit City reported cash and cash equivalents ranging from $55 million to $296 million.*

b. Suggest a comprehensive approach to liquidity assessment that could avoid many of the pitfalls cited in (a).

One comprehensive approach is described below.

It would be ideal to utilize a series of ratios and other methods that ensure a thorough and intentionally redundant inquiry into the liquidity of a firm and its viability in the short term. One should start with the operating cash flow

ratio to identify how viable the firms' primary operations are in generating cash to satisfy its short-term obligations. One could then review the current and quick ratios to identify any balance sheet items that might by pumping up the firm's assets without addressing its need for liquidity. This could expose issues with the salability of inventory held by the firm and the quality of its accounts receivable. Next, the makeup of the firm's current liabilities could be studied to determine which will require cash payments and which will be satisfied by providing goods or services for which payment has already been received. Lastly, and very importantly, the firm's metrics should be compared to those of its peers, in light of variations that exist between different lines of business.

REFERENCES

Ammons, J. and Gosman, M. (2012). Cautions When Using Working Capital Metrics to Assess Firms' Financial Health. *Journal of the International Academy for Case Studies*. V. 18, No. 3, pp. 11-14.

Cross, J. and Schellenger, M. (1994). FASB 95, Cash Flow, and Bankruptcy. *Journal of Economics and Finance*. V. 18, No. 3, pp. 261-274.

Fernando, J. (2024). Current Ratio Explained with Formulas and Examples. *Investopedia.com*. August 16, 20 pages.

Gallo, A. (2015). A Refresher on Current Ratio. *Harvard Business Review*. September 14, 8 pages.

Giacomino, D.E. and Mielke, D.E. (1993). Cash Flows: Another Approach to Ratio Analysis. *Journal of Accountancy*. V. 175, No. 3, pp. 55-58.

Hayes, A. (2024). Days' Sales in Inventory. *Investopedia.com*. June 5, 8 pages.

Jang, S. and Ryu, K. (2004). Performance Measurement Through Cash Flow Ratios and Traditional Ratios: A Comparison of Commercial and Casino Hotel Companies. *Journal of Hospitality Financial Management.* V. 12, No. 1, pp. 15-25.

Largay, J. III and Stickney, C. (1980). Cash Flows, Ratio Analysis, and the W.T. Grant Company Bankruptcy. *Financial Analysts Journal*. V. 36, No. 4, pp. 51-54.

Mills, J. and Yamamura, J. (1998). The Power of Cash Flow Ratios. *Journal of Accountancy*. October 1.

Suozzi, T. (2024). Liquidity Ratios: Key Metrics to Assess Short-Term Financial Health. *Suozziformy.com* August 20, 11 pages.

Martin Gosman, Ph.D., is Visiting Scholar in Economics at Wesleyan University and Professor Emeritus of Accounting at Quinnipiac University.

Mathius Gazi is a 2025 graduate of Wesleyan University.

Liam Kennedy is a 2025 graduate of Wesleyan University.

Sophia Lindus is a member of the Class of 2026 at Wesleyan University.

Experiential Learning: Boosting Student Perception and Interest with Data Analytics Projects in An Undergraduate Information System Course

Jian (Denny) Lin, Naveed Saleem, Michael Yu-Chi Wu and Nanfei Sun
Management Information Systems - University of Houston, Clear Lake
Houston, Texas 77058 USA

ABSTRACT

This paper presents a successful practice for integrating data analytics projects into an introductory Management Information Systems (MIS) course for teaching non-MIS undergraduate students at a business school. Guided by principles of experiential learning, the course employs Microsoft Access, Excel, and Tableau, enabling students to work with real-world data. Through these projects, students deepen their understanding of concepts such as data, information, databases, data analysis, and business intelligence, while also developing essential software skills. Notably, students' interest in data analytics projects—particularly those utilizing real-world data—surpasses that of traditional textbook assignments. This approach significantly enhances students' perceptions of the knowledge gained and their interest in modern information systems.

Keywords: introduction course, management information systems, experiential learning, data analytics

INTRODUCTION

In today's business landscape, Information Systems (IS) and Information Technology (IT) are ubiquitous. Employees are increasingly expected to leverage IS/IT to perform job-related tasks (Aasheim et al., 2012). Job seekers lacking technological proficiency face heightened competition (Johnson, 2010). Consequently, IT skills and IS knowledge are critical components of business education, often assessed in comprehensive Educational Testing Service (ETS) business field tests and considered by accreditation agencies like the Association to Advance Collegiate Schools of Business (AACSB International) (Attaway et al., 2011). There is a growing demand for IS courses in universities, particularly to enhance the career prospects of undergraduate students (Flowers and Pascarella, 2000; Grubb and Lazerson, 2005; Privateer, 1999; Wall and Knapp, 2014). Many business curricula require IS courses (Herath, 2015).

At the College of Business, University of Houston – Clear Lake (UHCL), the Department of Management Information Systems (MIS) teaches an introductory IS course (course number ISAM 3303) mandatory for all students. This course covers various IS topics essential for managing complex organizations, including decision-making, competitive advantage, information security, databases, business intelligence, enterprise systems, and systems development. A significant component involves hands-on development of spreadsheet applications for reporting, problem-solving, and managing business operations.

Most students enter this course with non-MIS majors, such as Accounting, Marketing, Finance, or General Business, leading to challenges in motivation, as many lack intrinsic interest in IT. Students often perceive IS/IT as complex and may underestimate the importance of mastering these skills for their careers. Additionally, traditional lecture and examination models have proven inadequate for this practical subject, where theory and hands-on skills are closely intertwined (Nafjan, 2010). Students tend to rely heavily on instructor guidance and textbook instructions, often resorting to short-term memorization rather than developing problem-solving skills applicable in real-world contexts.

In this paper, we propose a best practice rooted in experiential learning, learning through experience. This approach immerses students in hands-on activities, encouraging reflection to cultivate new skills and ways of thinking (Lewis and Williams, 1994). By incorporating data analytics projects using real-world datasets, we aim to engage students more effectively. Students often find data analysis more relatable and exciting compared to programming or traditional IS topics, which in turn helps them with deeper understanding of course concepts.

The paper is structured as follows: the next section outlines the course design and teaching approaches, Then, a section discusses results from implementing these approaches, followed by another section that describes two data analytics projects utilized in the course. The paper concludes with the final section.

COURSE DESIGN AND APPROACHES

Course Design

The introductory MIS course at UHCL covers a wide array of IS and IT concepts. Students often struggle to grasp these concepts through textbook reading alone, as they feel disconnected from the practical applications of the systems discussed. Research highlights the gap between academic learning and practical requirements in business education, particularly in technical fields like MIS (Wu and Sankar, 2013; Fischer and Pollock, 2004; Stam and Elfring, 2008; Tsai, 2001).

Aligning classroom instruction with employer expectations is crucial (Oh et al., 2004). Recent studies indicate that Microsoft Excel is the most sought-after software skill in job postings (Indeed.com). Therefore, the course emphasizes mastering Excel for reporting and solving financial or business problems. While several Excel textbooks offer practical assignments, students often depend on detailed instructions, lacking true understanding.

To enhance Excel training, we introduced Mindtap, an interactive Excel simulation tool. Mindtap features hundreds of practice questions with immediate feedback, facilitating repeated practice and mastery of Excel's fundamental functions. However, while Mindtap improves technical skills, it does not fully foster critical thinking required for problem-solving.

Objectives of Integrating Data Analytics Projects

To address the challenges mentioned above, we integrate data analytics projects into the course, grounded in experiential learning principles. Given the popularity of big data, students show increased interest in data analytics. Numerous engaging real-world datasets are publicly available, enabling the creation of relevant projects. These projects not only enhance motivation but also bridge experiential learning with critical thinking. Upon project completion, students exhibit improved perceptions of the course's relevance and their interest in modern IS.

The objectives of these projects include:

- Understanding the transformation of data into information.
- Mastering database concepts and query tools.
- Developing strong spreadsheet skills.
- Utilizing pivot tables and charts in Excel for data analysis.
- Enhancing data visualization skills using various tools.
- Fostering interest in IS and IT.
- Mastering business intelligence techniques to support decision-making.

Software Environment

Students use Microsoft Excel to create data tables. In the course's first half, Mindtap facilitates learning fundamental Excel features. In the second half, students apply Excel to their data analytics projects. They can access numerous interesting datasets in .csv format from sources like Kaggle.com, allowing for the creation of pivot tables and charts. Students often express excitement upon completing their first dynamic data visualization dashboard.

We also introduce a data analytics project using Microsoft Access to teach modern database concepts and querying techniques. Students can create database tables using .csv files.

Tableau, a powerful data visualization tool, is introduced in one course session. It offers free academic access and comes with built-in datasets and tutorials, enabling students to quickly learn analytical tasks. Most students gain confidence in using modern IS tools after completing these tasks.

Datasets

Many engaging datasets are accessible online, with Kaggle.com being a prime resource. Other sources include city data portals. Most datasets are available in .csv format, compatible with Access, Excel, and Tableau. We find that real-world datasets significantly captivate students' interest. Examples of datasets used include NBA games & player statistics, Houston crime data, and Texas Airbnb listings, etc.

Examination Methods

The course's examination methods align with experiential learning goals. Two exams incorporate both paper-based and computer-based components. Multiple-choice questions assess IS concept understanding, while practical

computer tasks evaluate problem-solving skills. The midterm utilizes Mindtap questions, requiring students to complete approximately 50 small Excel tasks. For the final exam, students analyze and visualize data with datasets using Excel and/or Tableau. This hands-on approach has led to increased student engagement.

RESULTS

To highlight the effectiveness of hands-on projects, we leverage two key sources of evidence: student feedback and student performance. To begin, we initiate our investigation by examining student feedback from IDEA surveys. These surveys, brief questionnaires completed by students near the end of the semester, serve to capture their opinions and perceptions of the course. Following this, we proceed to analyze student performance to assess whether students who actively engage in hands-on projects show a greater gain in understanding the MIS concepts throughout the semester compared to their classmates.

Student feedback on the data analytics projects has been overwhelmingly positive. The completion of these hands-on projects has led to improved performance on paper-based questions related to course concepts, highlighting the effectiveness of experiential learning in IS education. As data analysis becomes increasingly important, these projects effectively capture student interest and deepen their understanding of key IS and IT concepts. Notably, some non-MIS students have chosen advanced MIS electives—such as programming courses—a shift that was rarely seen before. This change is likely driven by their enhanced confidence in mastering IT skills and a greater appreciation for the relevance of IS and IT in their career development.

Below is a course evaluation conducted via IDEA reflecting positive student responses, with key items receiving scores of 4.6/5.0 or higher.

Table 1. Evaluation Items and Scores

Item	Score
Gaining factual knowledge (terminology, classifications, methods, trends)	4.6
Learning fundamental principles, generalizations, or theories	4.6
Learning to apply course material (to improve thinking, problem solving, and decisions)	4.6
Developing specific skills, competencies, and points of view needed by professionals in the field most closely related to this course	4.7

To evaluate the impact of data analytics projects, we examine the relationship between project performance and changes in student exam rankings. Projects are assigned after the midterm exam. While it may seem intuitive to measure improvement using raw exam scores, we instead opt for rankings, as they reflect students' relative standing within the class and naturally account for variations in exam difficulty. For example, if a more challenging final exam follows a relatively easier midterm, raw score comparisons may not accurately capture true learning progress. In contrast, changes in exam rankings provide a clearer measure of student improvement, suggesting that those who excel in projects tend to show greater learning gains. Thus, using relative class standing through rankings offers a more precise assessment of the educational benefits of hands-on projects.

Figure 1. Standardized regression model

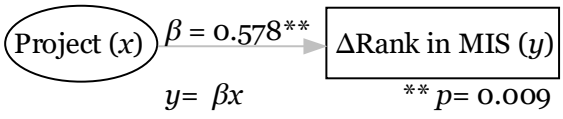


Figure 1 presents a standardized regression model that predicts changes in student rankings on the MIS (Management Information Systems) assessment based on project completion. In this model, the independent variable, Project, represents normalized project scores derived from individual assessments. These scores reflect each student's project completion percentage and are normalized to facilitate meaningful comparisons and regression analysis. After normalization, students with above-average scores exhibit positive Project values, while those with below-average

scores display negative values.

The dependent variable, ΔRank in MIS, measures the change in class ranking from the midterm to the final MIS exams. A lower numerical rank indicates better subject mastery (e.g., a rank of 2 is superior to a rank of 9). To ensure that improvements are captured as positive changes, ΔRank in MIS is calculated as the difference between midterm and final rankings. A positive ΔRank indicates an improvement in class standing— for example, moving from 5th to 1st place results in a ΔRank of +4.

To further illustrate the effect of project completion on class rankings, consider the cases of three students. Student A, who did not participate in the project, experienced a drop in rank from 2nd at midterm to 13th in the final exam (ΔRank in MIS = -11). Student B, who completed less than half of the project, declined from 13th to 19th (ΔRank in MIS = -6). In contrast, Student C, who fully completed the project, showed significant improvement, rising from 15th to 2nd (ΔRank in MIS = +13). Notably, Student C's success underscores how project completion can substantially enhance a student's understanding of MIS concepts relative to their peers.

Overall, the regression analysis presented in Figure 1 reveals a statistically significant positive linear relationship between Project and ΔRank in MIS ($\beta = 0.578$, $p = 0.009$). This positive beta coefficient indicates that greater project completion is associated with greater improvements in class ranking. These findings reinforce the strong connection between engaging in hands-on projects and achieving a deeper mastery of MIS concepts compared to peers.

EXMPLE PROJECTS

This section presents two example projects designed for the course, utilizing Microsoft Access and Excel. These projects exemplify hands-on learning, enabling students to apply their knowledge in practical contexts.

A Microsoft Access Project with NBA Players Data

Project Goals:

- Understand the fundamental structure of a relational database, including tables, fields, and records.
- Master the skills required to write queries to extract information from large datasets.
- Learn additional database techniques as necessary.

Project Instructions: Students are tasked with downloading a dataset from Kaggle, which contains historical data on NBA players since 1950. The dataset includes the following eight columns:

- ID (system-generated)
- Player (name)
- Height (in cm)
- Weight (in kg)
- College
- Year of Birth
- City of Birth
- State of Birth (or country for foreign players)

The students are instructed to download a file from https://www.kaggle.com/drgilermo/nba-players-stats#Players.csv. The file contains data about NBA players since 1950 and has the following eight columns as attributes about the players.

- ID (system-generated)
- Player (name)
- Height in cm
- Weight in kg
- College
- Year of birth
- City of birth
- State of birth (for foreign players, it is their country)

Given that our university is in Houston, Texas, and many students are from the Greater Houston area, the project focuses on players associated with Texas. This local connection enhances student engagement.

Example Tasks:

1. Create an Access database named "NBA Players" and import the downloaded NBA Players file to establish a table named "NBA Players." Designate a primary key column.
2. Write queries to answer the following questions:
    - Who is the tallest player in NBA history? Is it Yao Ming? What is his height (in cm)?
    - Who is the shortest player in NBA history? What is his height (in cm)?
    - How many NBA players have come from the University of Houston? Include the columns for player name, height, and weight in the query.
    - How many Chinese players have played in the NBA?
    - What is the average height of NBA players?
    - Create a query to retrieve all information on James Harden, including his name, height, weight, birth city and state, and college. Use this query to create a form. Answer the following:
        - From which university did James Harden graduate from?
        - In which city was James Harden born?
    - Compare the average height and weight of players born in the 1950s (1950-1959) with those born in the 1980s (1980-1989). What conclusions can you draw?

A Microsoft Excel Project with Houston Crime Data

Project Goals:

- Practice extracting information from a large dataset to understand the concept of "converting data into information" as outlined in the textbook.
- Recognize the advantages of data visualization and the various types of charts available.
- Learn to use pivot tables and pivot charts for data analysis.
- Create a data visualization report, such as a dashboard, using pivot tables and charts.

Students are instructed to download a dataset containing monthly crime statistics from Houston, available at the City of Houston's data portal. This file includes multiple columns, focusing primarily on:

- Offense type
- Offense time
- Geographic location (latitude and longitude)
- Zip code
- Houston Police Department (HPD) division

Through this project, students will gain practical experience in data analysis and visualization, reinforcing their understanding of the importance of data in decision-making.

Project Description: Crime Data Analysis for the City of Houston. You are tasked with analyzing recent crime data published by the Houston Police Department (HPD) to create a visual report for your supervisor. This report will help them quickly understand crime trends and issues within the city.

Project Instructions:

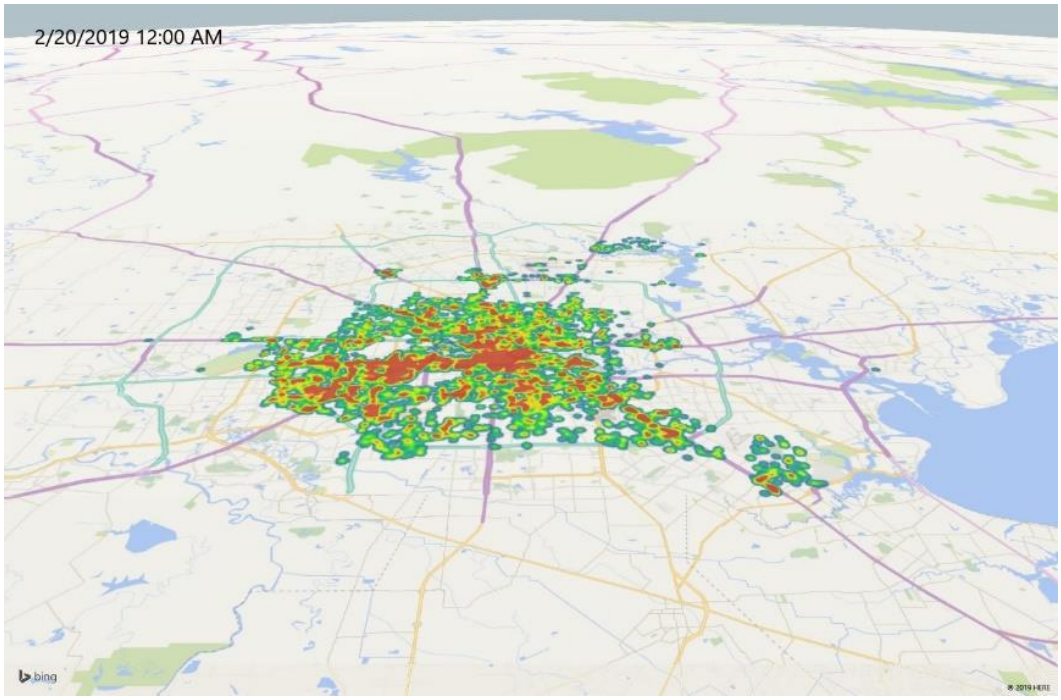
1. Download the Data:
    - Obtain the latest Houston crime .csv file (e.g., for February 2019) and convert it into an Excel spreadsheet.
2. Data Analysis:
    - On a new sheet named “Data Analysis,” create pivot tables and pivot charts to answer the following questions:
3. Identify the Most Common Offense:
    - Which offense type had the largest number of cases in February 2019 in Houston?
4. Auto Theft Analysis:
    - How many cases of auto theft occurred in February 2019?
5. Zip Code Comparison:
    - Which zip code had the highest number of auto theft cases?
6. Safety Assessment:

- Based on the total number of offense cases (all types), identify the safest and least safe zip code(s).

7. Dynamic Visualization:
    - Create a pivot chart that displays offense figures, incorporating two slicers for zip code and offense type.
8. Heat Map Creation:
    - Develop a heat map illustrating the number of offenses, similar to the example shown in Figure 2.
9. Dashboard Development:
    - Use the pivot tables and charts to create a dynamic dashboard, as shown in Figure 3. Test the functionality of the dashboard to ensure it provides interactive insights.

By completing this project, you will gain valuable experience in data analysis and visualization, helping to inform decisions and enhance community safety efforts.

Figure 2. A Heat Map in The Houston Crime Data Project



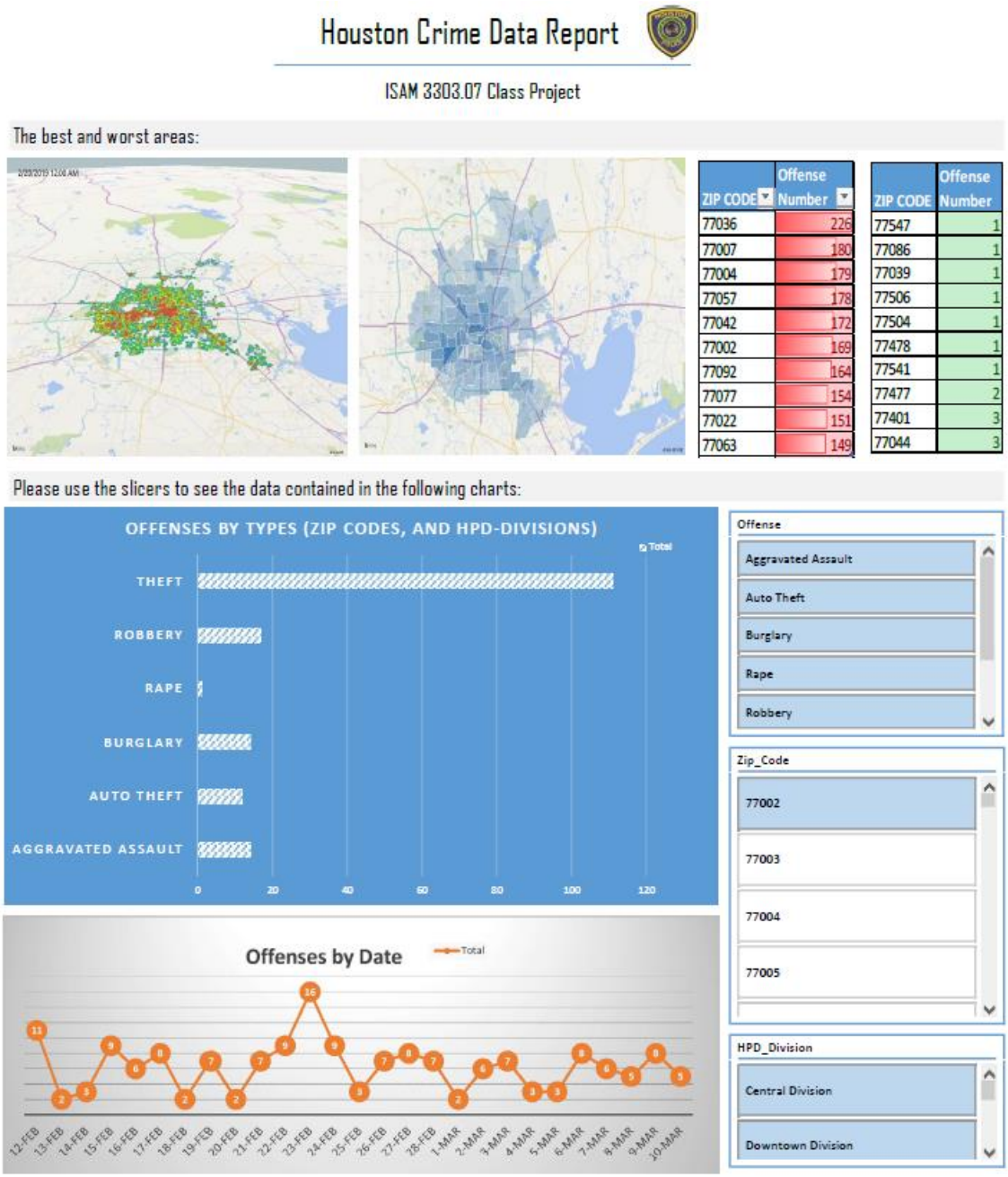


Figure 3. A Screenshot of The Houston Crime Data Dashboard

SUMMARY

By employing an experiential learning approach that incorporates data analytics projects, students in the introductory Management Information Systems (MIS) course engage in active learning more effectively. The results have been very encouraging: students demonstrate a significantly improved understanding of the topics and concepts addressed in the projects.

At the same time, they acquire practical skills in data analysis, advanced spreadsheet functions, and data visualization tools. This hands-on experience greatly enhances their confidence and interest in pursuing additional IT skills in the future.

REFERENCES

Aasheim, C., Shropshire, J., Li, L., & Kadlec, C. (2012). Knowledge and Skill Requirement for Entry-Level IT Workers: A Longitudinal Study. Journal of Information Systems Education, 23(2), 192-204.

Attaway, A. N., Chandra, S., Dos Santos, B. L., Thatcher, M. E., & Wright, A. L. (2011). An approach to meeting AACSB assurance of learning standards in an IS core course. Journal of Information Systems Education, 22(4), 355– 366.

Fischer, H. M., & Pollock, T. G. (2004). Effects of social capital and power on surviving transformational change: The case of initial public offerings. Academy of Management Journal, 47(4), 463–481.

Flowers, L. & Pascarella, E. T. (2000). Information Technology Use and Cognitive Outcomes in the First Year of College. Journal of Higher Education, 71(6), 637-667.

Grubb, W. N & Lazerson, M. (2005). Vocationalism in Higher Education: The Triumph of the Educational Gospel. Journal of Higher Education, 76(1), 1-25.

Herath, T. C. (2015). Student Learning and Performance in Information Systems Courses: The Role of Academic Motivation. Decision Sciences Journal of Innovative Education Vol. 13(4), 583-601.

Johnson, M. A. (2010). Lack of Computer Skills Foils Many Job-Seekers. Retrieved September 20, 2013, from http://www.nbcnews.com/id/33106445/ns/technology_and _science/t/lack-computer-skills-foils-many-job-seekers/

Lewis, L. H. and Williams, C. J. (1994). Experiential Learning: Past and Present. New Directions for Adult and Continuing Education, 1994(62), 5-16.

Nafjan, K. A. (2010). The Integrated Lab: An assessment to combining classroom curriculum and lab experiments to teach information systems development course. Proceedings of IEEE 10th International Conference on Advanced Learning Technologies.

Oh, H., Chung, M.-H., & Labianca, G. (2004). Group social capital and group effectiveness: The role of informal socializing ties. Academy of Management Journal, 47(6), 860–875.

Privateer, P. M. (1999). Academic Technology and the Future of Higher Education. Journal of Higher Education, 70(1), 60-79.

Stam, W., & Elfring, T. (2008). Entrepreneurial orientation and new venture performance: The moderating role of intra-and extra-industry social capital. Academy of Management Journal, 51(1), 97–111.

Tsai, W. (2001). Knowledge transfer in intra-organizational networks: Effects of network position and absorptive capacity on business unit innovation and performance. Academy of Management Journal, 44(5), 996–1004.

Wall, J. D. and Knapp, J. (2014). Learning Computing Topics in Undergraduate Information Systems Courses: Managing Perceived Difficulty. Journal of Information Systems Education, Vol. 25(3), 245-259.

Wu, Y. and Sankar, C. S. (2013). Impact of Hands-On Research Experience on Students' Learning in an Introductory Management Information System Course. Decision Sciences Journal of Innovative Education Vol. 11(4), 335-358.

Dr. Jian (Denny) Lin is an Associate Professor in Management Information Systems at the University of Houston-Clear Lake. He received a Ph.D. in Computer Science from the University of Houston. Dr. Lin is active in research of embedded systems design, energy-efficient computing, big data and artificial intelligence. He has published articles in a variety of IEEE/ACM conferences, and journals such as Journal of Systems Architecture: Embedded Software Design, Big Data Research, etc.

Dr. Naveed Saleem is a Professor of Management Information Systems at the University of Houston-Clear Lake. His research papers have been published in The Journal of Health Management, The International Journal of Business Information Systems, Business Education Innovation Journal, The Journal of Management Information Systems, Journal of Information Technology in Education, Decision Support Systems, etc.

Dr. Michael Yu-Chi Wu is an Associate Professor in Management Information Systems at the University of Houston-Clear Lake. His research integrates technology, education, and software development. Dr. Wu's primary research focuses on artificial intelligence to foster adaptive learning environments for introductory programming. These environments are designed to enhance students' problem-solving capabilities and computational thinking skills. He holds a Ph.D. in Electrical Engineering from the New Jersey Institute of Technology.

Dr. Nanfei Sun is an Assistant Professor in Management Information System at the University of Houston-Clear Lake. He received his PhD from the Computer Science Department at the University of Houston in 2006. He previously worked for the IBM T.J. Watson Research Centre and Hubwoo. His research interests are in artificial intelligence, data analytics, and computational physiology. Dr. Sun is known for his pioneering work on unobtrusive measurement methods for heart function and

Business Students' Perception of Personal and Earnings Management Ethics: The Role of Emotional Intelligence

Rafik Z. Elias, California State University, Los Angeles, CA USA

ABSTRACT

Significant research has documented the necessity of developing ethical awareness among business students and the importance of psychological variables in shaping this development. The current study examines the psychological variable of trait emotional intelligence and its relationship with business students' ethical perception. Using a sample of undergraduate and graduate business students, the study found that students who scored higher on emotional intelligence were more likely to behave ethically in personal and business ethics situations. Earnings management actions that benefited the company were compared to those that harmed the company. Students with high emotional intelligence perceived earnings management actions that benefited the company as more unethical compared to students who scored lower on emotional intelligence. Business instructors should consider discussing psychological factors, especially emotional intelligence, in their business ethics courses.

Keywords: Business Ethics, Earnings Management, Emotional Intelligence.

INTRODUCTION

Corporate ethics failures over the last few decades led to a change in corporate culture to emphasize ethical behavior in all areas of business. Researchers have argued that ethical development should be integrated in the business ethics curriculum since current business students will be tomorrow's business managers (Ghoshal, 2005). This call was becoming more urgent since some research found students became less ethical as they progressed through their business education (Ferraro et al. 2005). Several psychological variables were presented as potentially related to ethical perception among business students. For example, Harris et al. (2022) found that business managers with dark personality traits had lower ethical perceptions compared to those without such traits.

The current study adds to the business ethics literature by examining trait emotional intelligence as a psychological variable potentially related to ethical perception among business students. Mayer et al. (1999) presented emotional intelligence as a person's ability to recognize personal and others' emotions and to take actions based on this recognition. This ability was related to many positive outcomes in life, especially among college students (Mikolajczak et al. 2009). The study examines the relationship between emotional intelligence and the ethical perception of personal and business ethics situations. The study also examines the relationship between emotional intelligence and the specific unethical accounting practice known as "earnings management".

The paper presents a literature review of personal and business ethics among college students as well as the accounting practice of earnings management. A discussion of emotional intelligence and its importance in psychology and education is followed by an explanation of the study's research design. The results and an overall discussion are finally presented.

LITERATURE REVIEW

Personal Ethics and Business Ethics

Ethics has generally been defined as "the inner guiding moral principles, values, and beliefs that people use to analyze or interpret a situation and then decide on the appropriate way to behave" (Jones and George, 2011, 88). Cheng and Fleischmann (2010, 24) specifically defined personal values as "what individuals love, hate or to which they are indifferent". The authors argued that personal ethics are critical to human behaviors. Based on this link between ethics and behavior, the ethical perception of college business students has received considerable research attention in the last few decades. This extensive research was motivated by the occurrence of many high-profile corporate ethical failures and the public's loss of trust in ethical organizational behavior (Castille et al. 2018). Researchers argued that current business students will eventually become business professionals in all areas of business (Sigurjonsson et al. 2015) and, therefore, it is important to focus on ethics education among business students in order to effect change in business ethics in the future.

Some research (e.g. McKinzie et al. 2022) found that current students exhibited higher personal ethics perception than those from 40 years ago using personal ethics vignettes. On the other hand, other research (e.g. Weber and Elm, 2018) found that current business students reasoned at a lower level than business students from the 1960s-1970s and 1980s-1990s using business ethics vignettes. Himes et al. (2021) also found that business majors had lower levels of ethical attitudes compared to non-business majors. Baker (2014) advanced the theory that unethical workplace behavior can be minimized by emphasizing ethical education during the college years. Jones (2009) found that exposing business students to just five, 75-minute, classes and two assignments significantly increased their moral reasoning level. Gallbraith and Webb (2010) noted that moral excellence results from repetitious training in good habits.

The Ethics of Earnings Management

Earnings Management is a specific unethical practice unique to the accounting profession. It is defined as "the choice by an accounting manager of accounting policies so as to achieve certain objectives" (Scott, 2003, 369). Research has examined the reasons for earnings management. Two major reasons were found: First, self-serving executives employ short-term accounting maneuvers to achieve certain financial results that will enhance their job security, reputation and compensation (Bebchuck and Grinstein, 2005). Miller and Xu (2019) emphasized that such actions are short-term in nature with relatively little risk but with significant personal benefit to the executives. Second, research focuseed on the pressure on managers to achieve investors' expectations as the primary reason managers engage in such behavior (Kasznick, 1999). Aglietta and Reberioux (2005) argued that the focus on meeting investors' expectations forces the executives to target specific results benefiting the shareholders at the expense of all stakeholders.

The ethics of earnings management actions have been extensively studied since this practice was first brought to light in the late 1990s. Tenbrunsel and Messick (2004) questioned whether self-deception should be undertaken by managers for the greater good of the company. Cooper (2008) pointed to the negative consequences of missing earnings forecasts such as a decrease in stock price and analysts' downgrade of the company that could send it into a downward spiral. On the other hand, Prentice (2007) noted that many large-scale fraud situations began with minor earnings manipulation. Belski et al. (2008) analyzed whether business students viewed earnings management actions differently based on the reasons for such actions. Opportunistic earnings management actions that served the managers were viewed as more unethical compared to those actions that benefited the company (Belski et al., 2008).

Psychological Factors and Ethics

Significant research examined different psychological variables and their relationship with personal, business and earnings management ethics. Beaudoin et al. (2015) noted that an individual's personal code of ethics significantly affects their ethical judgment. Ham et al. (2017) found that CEOs scoring high on narcissism were more likely to engage in earnings management actions compared to others. Lapointe-Antunes et al. (2022) focused on executives' honesty and found that when both the CEO and CFO were honest, reported earnings were of higher quality compared to when only one of them was honest. Harris et al. (2022) found that recruiters favored hiring a candidate with dark personality traits in a CFO position when the organization faced pressure to manage earnings. The current study examines the psychological variable of emotional intelligence as potentially related to personal, business and earnings management ethical perception.

Emotional Intelligence

Emotional intelligence is a psychological trait that has not received sufficient attention in the business literature. Salovey and Mayer (1990, 189) introduced trait emotional intelligence and defined it as "the subset of social intelligence that involves the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions". High emotional intelligence was found to be related to many positive outcomes in life, especially in the workplace. Ashkenasy and Hooper (1999) found that high emotional intelligence correlated with success at work and Cote (2014) found a similar relationship regarding job performance. Wong and Law (2002) found that leaders with high emotional intelligence were more satisfied with their job and more likely to take on extra roles compared to those with low emotional intelligence. Al Thawabieh (2024) emphasized that successful HR practices can maximize the positive relationship between leaders' emotional intelligence and organizational success.

Mayer et al. (1999) observed that emotional intelligence was shown to grow the most from adolescence to early adulthood. Therefore, the current study focuses on undergraduate and graduate college students since they are learning how to operationalize their growing emotional intelligence. Significant research in the education field documented the positive consequences of college students' emotional intelligence and how it helps them acquire the social capital needed for career success (e.g. Rode et al. 2017). Mikolajczak et al. (2009) found that higher emotional intelligence

was related to less stress, and less mood deterioration among college students. Extremera and Fernandez-Berrocal (2006) found that higher emotional intelligence was related to better health among college students. Merino-Soto et al. (2024) noted that increasing emotional intelligence of nursing students resulted in less stress and less academic burnout. Garg et al. (2016) concluded that emotional intelligence was positively related to adjustment to college, and with first year GPA.

Hypotheses Development

Although significant research examined the positive consequences of emotional intelligence on many life outcomes, very little research examined its relationship with ethical behavior. For example, Rettinger (2017) found a negative relationship between students' emotional intelligence and their propensity to cheat. The current study fills this gap in the literature by examining the relationship between emotional intelligence, and personal, business and earnings management ethical perception. Based on the previous literature documenting the numerous benefits of emotional intelligence, the following hypotheses are tested:

H1: Business students with higher emotional intelligence scores are more likely to behave ethically in a personal ethics situation compared to those with lower scores.

H2: Business students with higher scores on emotional intelligence are more likely to behave ethically in a business ethics situation compared to those with lower scores.

Wotakpa (2018) emphasized that accountants are good problem solvers and that increasing their emotional intelligence will help them become leaders in the profession. Sharma et al. (2019) noted that emotional intelligence involves a person empathizing with others and acting accordingly. Based on this research, the following hypothesis tests the relationship between emotional intelligence and ethics in an accounting context as follows:

H3: Business students with higher scores on emotional intelligence are more likely to view earnings management situations as unethical compared to those who lower scores.

RESEARCH DEVELOPMENT

Sampling

The sample used in this study consisted of junior and senior undergraduate and graduate business students in a large AACS-accredited University on the West Coast of the U.S. Upper-level undergraduate students were selected for the study to make sure they have completed a course in business ethics, and two courses in accounting. These courses are typically completed at the sophomore level at this university. A survey was administered to students during class time. The students were enrolled in many different business classes taught by many different instructors. The survey took an average of 10-15 minutes to complete. The survey provided for anonymity. Students were allowed to end their participation in the survey at any time with no penalty. The usable sample Consisted of 391 students comprising of 321 undergraduate students and 70 graduate students. The survey gathered demographic information regarding major, class grade, age and GPA. Subsequent analyses revealed only a weak correlation between GPA and the earnings management situation. Students with higher GPA rated this situation as slightly more unethical compared to students with lower GPAs. No other statistically significant relationships emerged between demographic variables and personal, business, and earnings management ethics or emotional intelligence.

Survey Measures

The questionnaire consisted of three case studies to measure personal, business and earnings management ethics. The first case was adapted from Brown et al. (2010) and involved a small business owner who ordered 10 computers but was only billed for 9 of them by mistake. The students had to indicate the likelihood that they would inform the supplier of the mistake and pay for the extra computer or ignore the mistake and take the extra computer without paying for it. The likelihood of the buyer paying for the extra computer was recorded on a seven-point scale ranging from 1(highly unlikely) to 7(highly likely). The second case was a personal ethics case, also adapted from Brown et al. (2010), and dealt with someone who found an envelope with cash along with the owner's personal contact information. The student respondents rated their likelihood of contacting the owner and returning the cash on a seven-point scale ranging from 1(highly unlikely) to 7(highly likely).

The last case dealt with an accounting earnings management situation and was adapted from Johnson et al. (2012). A manager at an automobile dealership increased his compensation in an unethical manner by manipulating revenues

and expenses for his dealership. Johnson et al. (2012) developed two versions of this case and both resulted in the same personal gain to the manager. The first version resulted in a favorable outcome to the automobile dealership using accounting manipulation (overall favorable company consequence). The second version resulted in negative financial consequences to the automobile dealership because of the accounting manipulation (overall unfavorable company consequence). Johnson et al. (2012) found that respondents had different ethical perceptions of a situation depending on whether it benefited the organization or harmed it. Students rated actions that benefited the company as more unethical compared to actions that harmed the company. Therefore, this study also presents two versions of the case. The student respondents were randomly assigned to only one version of the case. They rated the ethics of the manager's action on a seven-point scale ranging from 1(highly ethical) to 7(highly unethical). There were 193 responses to the first version (favorable consequences) and 198 responses to the second version (unfavorable consequences).

Trait emotional intelligence was measured using the questionnaire developed by Wong and Law (2002). The questionnaire consisted of 16 statements. Business students recorded their agreement/disagreement with each statement using a seven-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). Wong and Law (2002) revealed that the survey yielded four factors which corresponded to four emotional intelligence dimensions: Self-emotion appraisal (the ability of a person to understand their own emotions), others' emotion appraisal (the ability to understand others' emotions), use of emotion (the ability of a person to set goals based on their emotions), and regulation of emotion (the ability to control one's temper and personal emotions) (Wong and Law, 2002). A total score for emotional intelligence is also calculated. The questionnaire has been extensively tested and used in more than 15 countries (Libbrecht et al. 2014). Reliability estimates were .86, .85, .79 and .82 for the four emotional intelligence dimensions (Wong and Law, 2002).

STUDY RESULTS

Statistical summaries of the results are presented in Table 1. Analysis of Variance (ANOVA) was used to examine the mean differences between ethical perception for all cases. The results showed that students were moderately likely to behave ethically in both personal and business situations. However, they were more likely to behave ethically in the personal ethics situation (Mean=5.70/7.00) compared to the business ethics situation (Mean=5.28/7.00)($p<.01$). Regarding the earnings management scenarios, there was a statistically significant difference between the ethical perception of the case that resulted in favorable consequences for the company compared to the one that resulted in unfavorable consequences. Students were much more likely to view the favorable consequences case as more unethical (Mean=5.72) compared to the unfavorable consequences case (Mean=4.96)($p<.01$). Due to this difference in ethical perception between the two cases, further analyses were conducted separately for each case.

Table 2 shows Pearson correlation coefficients between business, personal, and earnings management actions (favorable and unfavorable) and emotional intelligence factors. The results indicate a positive relationship between emotional intelligence factors and total emotional intelligence and the likelihood of acting ethically in business and personal situations. Business students who scored higher on each emotional intelligence factor as well as total emotional intelligence were more likely to behave ethically in business and personal cases. The results support H1 and H2.

Table 1: Descriptive Statistics (N=391)

	Mean	Standard Deviation
Business ethics*	5.28	1.97
Personal ethics*	5.70	1.72
Earnings management** (Favorable consequences)(N=193)	5.72	1.45
Earnings management** (Unfavorable consequences)(N=198)	4.96	1.41
Self-emotion appraisal	5.57	1.20
Others'-emotion appraisal	5.45	1.07
Use of emotion	5.71	1.08
Regulation of emotion	5.26	1.30
Total emotional intelligence***	5.50	.87
GPA	3.12	.44

* Likelihood of acting in an ethical way
1=Highly likely and 7=Highly unlikely
** Ethical perception of the earnings management situation
1=Highly ethical and 7=Highly unethical
*** Emotional intelligence and factors scores (scale of 1-7)
Higher scores indicate higher emotional intelligence

Table 2: Correlation between Ethics and Emotional Intelligence

	Business Ethics	Personal Ethics	Earnings Management (Favorable) (N=193)	Earnings Management (Unfavorable) (N=198)
Self-emotional appraisal	.21***	.08**		
Others-emotional appraisal	.15***	.17***	.12***	
Use of emotion	.19***	.12***	.11*	
Regulation of emotion	.14***	.08*	.10*	
Total emotional intelligence	.23***	.15***	.13**	

Only statistically significant coefficients are reported. No statistically significant correlations were found with unfavorable earnings management actions.
* p<.10
** p<.05
***p<.01

The situation was different regarding earnings management actions. There was a clear relationship between emotional intelligence and the earnings management case that resulted in favorable company consequences. Business students with higher scores on emotional intelligence viewed this action as much more unethical compared to students with lower scores on emotional intelligence. However, there was no statistically significant correlation between emotional intelligence scores and ethical perception of earnings management actions with negative company consequences. Therefore, H3 is only partially supported.

CONCLUSION AND IMPLICATIONS

The current study investigated whether the psychological variable of trait emotional intelligence was related to personal, business and earnings management ethics. The results generally supported a strong relationship between

emotional intelligence and ethics. Previous research emphasized the necessity of integrating business ethics into the curriculum to give graduating students a foundation for ethical behavior in the workplace (Gallbraith and Web, 2010). The study also adds to the literature concerning the positive consequences of high emotional intelligence, especially among college students. Although the current study establishes correlation, not causation, the results showed that emotional intelligence was an important factor significantly related to high ethical perception among business students. The results of this study should be of use to business instructors in a variety of business courses, and accounting courses in particular. Business students should discuss the relationship between emotional intelligence and ethics using case studies, if possible. Accounting instructors should focus on this relationship as they attempt to sensitize students to the unethical nature of earnings management actions, especially those that benefit the company.

The results should be interpreted subject to the following limitations: First, the students surveyed came from only one large public university located on the West Coast. Most students were first-generation college students living in a large urban area. The results may or may not be generalizable to other business students around the U.S. with other backgrounds and socio-economic status. The potential effect of student demographic differences on ethical perception can be the subject of a future study in this area. Second, the students surveyed were upper-level undergraduate and graduate students in business. The study assumes that they have completed a business ethics course and at least two accounting principles courses. However, this is only an assumption based on the expected course sequence for these students. There is a slight possibility that a small number of these students may not have followed this course sequence and have only completed some but not all the expected courses.

REFERENCES

Aglietta, M., and Rebérioux, A. (2005). *Corporate governance adrift*. https://doi.org/10.4337/9781845425470

Al Thawabieh, F. (2024). The Role of Emotional Intelligence in Enhancing Effective Leadership: Mediating Role of Human Resource Practices. *Quality Access to Success*, V. 25 No. 202, pp. 242–252. https://doi.org/10.47750/QAS/25.202.26

Ashkanasy, N. M., and Hooper, G. S. (1999). Perceiving and Managing Emotion in the Workplace: A Research Agenda Based on Neurophysiology. *Australian Journal of Psychology*, V. *51*, pp. 51. https://espace.library.uq.edu.au/view/UQ:143461

Baker, D. F. (2014). When Moral Awareness isn't Enough. *Organizational Behavior Teaching Review*, V. *38 No.* 4, pp. 511–532. https://doi.org/10.1177/1052562913504922

Beaudoin, C. A., Cianci, A. M.,and Tsakumis, G. T. (2015). The Impact of CFOs' Incentives and Earnings Management Ethics on their Financial Reporting Decisions: The Mediating Role of Moral Disengagement. *Journal of Business Ethics*, V. *128 No.* 3, pp. 505–518. https://doi.org/10.1007/s10551-014-2107-x

Bebchuk, L. A., and Grinstein, Y. (2005). The Growth of Executive Pay. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.648682

Belski, W.H., Beams, J. D., and Brozovsky, J. A. (2008). Ethical Judgments in Accounting: An Examination on the Ethics of Managed Earnings. *Journal of Global Business Issues, Vol.* 2 No. 2, pp. 59-68.

Brown, T. A., Sautter, J. A., Littvay, L., Sautter, A. C., and Bearnes, B. (2010). Ethics and Personality: Empathy and Narcissism as Moderators of Ethical Decision Making in Business Students. *Journal of Education for Business*, Vol. *85 No. 4*, pp. 203–208. https://doi.org/10.1080/08832320903449501

Castille, C. M., Buckner, J. E., and Thoroughgood, C. N. (2018). Prosocial Citizens Without a Moral Compass? Examining the Relationship Between Machiavellianism and Unethical Pro-Organizational Behavior. *Journal of Business Ethics*, V. *149 No. 4*, 919–930. https://doi.org/10.1007/s10551-016-3079-9

Cheng, A., and Fleischmann, K. R. (2010). Developing a Meta-inventory of Human Values. *Proceedings of the American Society for Information Science and Technology*, V. *47 No. 1*, pp. 1–10. https://doi.org/10.1002/meet.14504701232

Cooper, C. (2008). *Extraordinary Circumstances: the journey of a corporate whistleblower*. http://digilib.umpalopo.ac.id:8080/jspui/bitstream/123456789/407/1/0470124296__Extraordinary%20Circumstances%20The%20Journey%20of%20a%20Corporate%20Whistleblower.pdf

Côté, S. (2014). Emotional Intelligence in Organizations. *Annual Review of Organizational Psychology and Organizational Behavior*, V. *1 No. 1*, pp. 459–488. https://doi.org/10.1146/annurev-orgpsych-031413-091233

Extremera, N., and Fernández-Berrocal, P. (2006). Emotional Intelligence as Predictor of Mental, Social, and Physical Health in University Students. *The Spanish Journal of Psychology*, V. *9 No. 1*, pp. 45–51. https://doi.org/10.1017/s1138741600005965

Ferraro, F., Pfeffer, J., and Sutton, R. I. (2005). Economics Language and Assumptions: How Theories can Become Self-Fulfilling. *Academy of Management Review*, V. *30 No. 1*, pp. 8–24. https://doi.org/10.5465/amr.2005.15281412

Galbraith, D. D., and Webb, F. L. (2010). Business Ethics: A View from the Classroom. *Journal of College Teaching & Learning (TLC)*, V. *7 No. 4*. https://doi.org/10.19030/tlc.v7i4.113

Garg, R., Levin, E., and Tremblay, L. (2016). Emotional Intelligence: Impact on Post-secondary Academic Achievement. *Social Psychology of Education*, V. *19 No. 3*, pp. 627–642. https://doi.org/10.1007/s11218-016-9338-x

Ghoshal, S. (2005). Bad Management Theories are Destroying Good Management Practices. *Academy of Management Learning and Education*, V. *4 No. 1*, pp. 75–91. https://doi.org/10.5465/amle.2005.16132558

Ham, C., Lang, M., Seybert, N., and Wang, S. (2017). CFO Narcissism and Financial Reporting Quality. *Journal of Accounting Research*, V. *55 No. 5*, pp. 1089–1135. https://doi.org/10.1111/1475-679x.12176

Harris, L. L., Jackson, S. B., Owens, J., and Seybert, N. (2021). Recruiting Dark Personalities for Earnings Management. *Journal of Business Ethics*, V. *178 No. 1*, pp. 193–218. https://doi.org/10.1007/s10551-021-04761-z

Himes, B. M., Olson-Buchanan, J. B., and Elson, D. (2021). Relationship between Ethical Attitudes and the Dark Triad: Differences among College Majors. *The Journal of Psychology*, V. *155 No. 8*, pp. 695–716. https://doi.org/10.1080/00223980.2021.1953954

Johnson, E. N., Fleischman, G. M., Valentine, S., and Walker, K. B. (2012). Managers' Ethical Evaluations of Earnings Management and its Consequences. *Contemporary Accounting Research*, V. *29 No. 3*, pp. 910–927. https://doi.org/10.1111/j.1911-3846.2011.01135.x

Jones, G. and George, J. (2011). *Contemporary Management* (11th Edition).: McGraw-Hill Education.
Jones, D. A. (2009). A Novel Approach to Business Ethics Training: Improving Moral Reasoning in Just a Few Weeks. *Journal of Business Ethics*, V. *88 No. 2*, pp. 367–379. https://doi.org/10.1007/s10551-008-9969-8
Kasznik, R. (1999). On the Association between Voluntary Disclosure and Earnings Management. *Journal of Accounting Research*, V. *37 No. 1*, p. 57. https://doi.org/10.2307/2491396
Lapointe-Antunes, P., Veenstra, K., Brown, K., and Li, H. (2021). Welcome to the Gray Zone: Shades of Honesty and Earnings Management. *Journal of Business Ethics*, V. *177 No. 1*, pp. 125–149. https://doi.org/10.1007/s10551-020-04713-z
Libbrecht, N., De Beuckelaer, A., Lievens, F., and Rockstuhl, T. (2014). Measurement Invariance of the Wong and Law Emotional Intelligence Scale Scores: Does the Measurement Structure Hold across Far Eastern and European Countries? *Applied Psychology*, V. *63 No. 2*, pp. 223–237. https://doi.org/10.1111/j.1464-0597.2012.00513.x
Mayer, J. D., Caruso, D. R., and Salovey, P. (1999). Emotional Intelligence Meets Traditional Standards for an Intelligence. *Intelligence*, V. *27 No. 4*, pp. 267–298. https://doi.org/10.1016/s0160-2896(99)00016-1
McKinzie, K., Chen, A., Rubach, M., and Carson, M. (2022). A Longitudinal Study of Perceived Ethics among Business Students. *Journal of Leadership Accountability and Ethics*, V. *19* No. 4. https://doi.org/10.33423/jlae.v19i4.5760
Miller, D., and Xu, X. (2019). MBA CEOs, Short-Term Management and Performance. *Journal of Business Ethics*, V. *154 No. 2*, pp. 285–300. https://doi.org/10.1007/s10551-017-3450-5
Mikolajczak, M., Petrides, K. V., Coumans, N., and Luminet, O. (2009). The Moderating Effect of Trait Emotional Intelligence on Mood Deterioration Following Laboratory-induced Stress. *DOAJ (DOAJ: Directory of Open Access Journals)*. https://doaj.org/article/c4a915b00b0b48139a86918b1374da3b
Prentice, R. A. (2007). Ethical Decision Making: More Needed than Good Intentions. *Financial Analysts Journal*, V. *63 No. 6*, pp. 17–30. https://doi.org/10.2469/faj.v63.n6.4923
Rettinger, D. A. (2017). The Role of Emotions and Attitudes in Causing and Preventing Cheating. *Theory Into Practice*, V. *56 No. 2*, pp. 103–110. https://doi.org/10.1080/00405841.2017.1308174
Rode, J. C., Arthaud-Day, M., Ramaswami, A., and Howes, S. (2017). A Time-lagged Study of Emotional Intelligence and Salary. *Journal of Vocational Behavior*, V. *101*, pp. 77–89. https://doi.org/10.1016/j.jvb.2017.05.001
Salovey, P., and Mayer, J. D. (1990). Emotional Intelligence. *Imagination Cognition and Personality*, V. *9 No. 3*, pp. 185–211. https://doi.org/10.2190/dugg-p24e-52wk-6cdg
Scott, W. R. (2003). *Financial accounting theory*, 3rd edition. Upper Saddle River, NJ: Prentice Hall.
Sharma, M., Khera, S. N., and Sharma, P. B. (2019). Applicability of Machine Learning in the Measurement of Emotional Intelligence. *Annals of Data Science*, V. *6 No. 1*, pp. 179–187. https://doi.org/10.1007/s40745-018-00185-1
Sigurjonsson, T. O., Arnardottir, A. A., Vaiman, V., and Rikhardsson, P. (2015). Managers' Views on Ethics Education in Business Schools: An Empirical study. *Journal of Business Ethics*, V. *130 No. 1*, pp. 1–13. https://doi.org/10.1007/s10551-014-2202-z
Tenbrunsel, A. E., and Messick, D. M. (2004). Ethical Fading: The Role of Self-Deception in Unethical Behavior. *Social Justice Research*, V. *17 No. 2*, pp. 223–236.
Weber, J., and Elm, D. R. (2018). Exploring and Comparing Cognitive Moral Reasoning of Millennials and Across Multiple Generations. *Business and Society Review*, V. *123 No. 3*, pp. 415–458. https://doi.org/10.1111/basr.12151
Wong, C., and Law, K. S. (2002). The effects of Leader and Follower Emotional Intelligence on Performance and Attitude. *The Leadership Quarterly*, V. *13 No. 3*, pp. 243–274. https://doi.org/10.1016/s1048-9843(02)00099-1
Wotapka, D. (2018). Increase your EQ and Shine in the Workplace. *Journal of Accountancy,* June 12.

Rafik Z. Elias is a Professor of Accounting at California State University, Los Angeles, USA. He received his Doctorate of Business Administration in Accounting from Louisiana Tech University and he is a CPA. His research has been published in *Journal of Business Ethics, Advances in Accounting, Advances in Public Interest Accounting, Accounting Education, Drake Management Review, Southern Journal of Business and Ethics, Journal of Education for Business, Managerial Auditing Journal,* and many national and regional conference proceedings. His research interests are in the areas of Business Education and Ethics.

A Framework for Using Virtual Experiences in Auditing Courses

Aamer Sheikh, Quinnipiac University, Hamden, Connecticut, USA
Kathleen Simione, Quinnipiac University, Hamden, Connecticut, USA
Kenneth Ryack, Quinnipiac University, Hamden, Connecticut, USA
Harrison Bass, Forage (EAB), New York, New York, USA

ABSTRACT

Auditing is a subject matter area in which it is often difficult to obtain practical experience without completing an internship before graduation. Yet students often struggle to understand auditing concepts without experiencing how an audit of the financial statements is conducted in the real world. This paper introduces a framework for the use of virtual work experiences that help students understand the different parts of the financial statement audit process. Forage (now part of EAB) has partnered with leading accounting firms to offer free virtual experiences in auditing to students around the world. It is expected that students will not only benefit from the specific experiences in auditing, but that these experiences may also help them become more interested in auditing as a profession. These virtual experiences align with content on the new Cerified Public Acccountant (CPA) exam and also help meet the latest iteration of the AACSB International accreditation standards for both business and accounting by fostering a unique environment for students to develop technical and professional skills and apply those skills in a real-world environment.

Keywords: AACSB International Assessment, Auditing, Course Design, Course Materials, Virtual Experiences

INTRODUCTION

It is often difficult for students in an auditing course to understand why the concepts they learn are important and how those concepts apply to practice. Thus, it can be challenging to engage audit students in the learning process and spark interest in auditing as a career. The literature on experiential learning theory suggests that providing students with experiential learning opportunities can significantly enhance student engagement in the learning process and facilitate their understanding of the material in a way that helps them connect the theory with practice. This is consistent with the Accounting Education Change Commission (AECC)'s call for a more active learning framework (AECC, 1990) and the Pathways Commission's recommendation of experiential learning as a method to develop professional judgment (The Pathways Commission, 2015, 9).

Virtual audit simulations are an excellent way to provide students with a hands-on real world experiential learning opportunity that will enhance their learning, help them understand the practical implications of the concepts they are learning, and generate interest in the audit profession. Forage (now part of EAB) offers five different virtual experiences at no cost to students. These simulations were created in partnership with three of world's largest accounting firms, namely EY, KPMG, and PwC. They are self-paced experiences that can easily be integrated into both undergraduate and graduate auditing courses. The simulations incorporate a variety of audit specific skills related to the planning and execution of an audit in addition to other skills such as analytical thinking, attention to detail, problem solving and professional communication. The content of the simulations aligns with material tested on the new CPA exam, Bloom's Taxonomy, and AACSB accreditation requirements.

In this paper, we discuss some of the literature that highlights the benefits of experiential learning. We then describe the free virtual audit simulations provided by Forage and leading accounting firms that can be easily integrated into both undergraduate and graduate auditing courses as an engaging real-world experiential learning component. In addition, we outline how the various virtual audit simulations align with the new CPA exam, Bloom's Taxonomy, and AACSB accreditation standards. Finally, we give implementation guidance on how to incorporate each simulation into an auditing course, and we provide examples of student feedback that illustrates how the simulations enhanced their learning, helped them understand the practical implications of what they were learning, and stimulated interest in the auditing profession.

LITERATURE REVIEW

Kolb's (1984) experiential learning theory cycle includes four stages: a concrete experience followed by reflective

observations, abstract conceptualization, and active experimentation. Students are actively engaged in activities in the concrete experience – do the work. Reflective observation necessitates student reflection on their experiences – what happened? Abstract conceptualization requires students to link their experiences with their knowledge and integrate their conclusions – analyze and assess. With active experimentation, students use what they learned to make decisions – put into action. These stages represent the grasping (concrete experience and abstract conceptualization) and transforming (reflective observation and active experimentation) of real-world experiences that Kolb defines as experiential learning where knowledge is created through the experience (Kolb, 1984; Kolb and Kolb, 2017).

Providing hands-on or experiential learning opportunities for students in a variety of forms has long been considered an effective tool to facilitate learning (Burton and McNamara, 2009; Butler, Church and Wheeler, 2019; Dellaportas and Hassall, 2013; Drake, 2011; Elijido-Ten and Kloot, 2015; Killian, Fabiola, Huber, and Brandon, 2022; Kolb, 1976; Reid, Butler, Comfort, and Potter, 2023; Schön, 1987; Stanley and Marsden, 2012; Twyford and Dean, 2023; and Yang, Cheung, and Fang, 2015). It includes providing students the opportunity to "learn by doing" followed by reflection (Lewis and Williams, 1994). This helps students connect theory with practice. Students actively engaged in experiential learning and the reflective practice that it necessitates can become better reflective practitioners (Schön, 1987). As Kolb (1976) noted, reflection is an important part of experiential learning. That is, learning by doing and reflecting back on the experience can better prepare students to deal with the challenges and dynamic environment they will face in the workplace.

Examples of experiential learning activities in the existing literature include but are not limited to case studies, internships and cooperatives, simulations (including virtual), games, field trips (events), problem-based learning, professional engagement and presentations and interviews (Albrecht and Sack, 2000; Burton and McNamara, 2009; Butler, Church, and Wheeler, 2019; Dellaportas and Hassall, 2013; Drake, 2011; Elijido-Ten and Kloot, 2015; Killian, Fabiola, Huber, and Brandon, 2022; Kolb, 1976; Kumar, and Preiser-Houy, 2024; Lapidus, Towell, and Hayes, 2015; Reid, Butler, Comfort, and Potter, 2023; Schön, 1987; Stanley and Marsden, 2012; Twyford and Dean, 2023; and Yang, Cheung, and Fang, 2015). They have been used and encouraged in a variety of educational programs including law (Burton and McNamara, 2009; Reid, Butler, Comfort, and Potter, 2023) and nursing programs (Brown, 2015; Koivisto, Niemi, Multisilta, and Eriksson 2017; and Wood, Zegwaard, and Fox-Turnbull, 2020).

Experiential learning has also become a noteworthy tool in accounting education given the importance of exposure to real-world experiences to prepare students for the accounting profession. The Accounting Education Change Commission (AECC, 1990) called for a more active learning framework that is seen with experiential learning. The Pathways Commission (2012, 75) also noted that experiential learning opportunities benefit students and recommended experiential learning as a way to develop professional judgment (The Pathways Commission, 2015, 9). Examples of experiential learning in accounting education have varied. Mastilak (2012) discusses the use of the board game Monopoly to prompt students' need for accounting information to make various decisions in the game and the use of LEGO blocks to produce products allowing students to visualize the production process as they learn the different cost concepts. Mastilak (2012) believes this approach better aligns with Millennials learning styles.

Development and implementation of problem-based learning in an Accounting Capstone course was illustrated in Stanley and Marsden (2012) where student perceptions showed the use of problem-based learning to be successful. Students agreed that their understanding of course concepts improved and that they became more adept with tackling unstructured problems and problems with incomplete information. The importance of questioning was identified as critical to providing the information needed to answer accounting problems. Teamwork was also identified as an important factor in solving unstructured accounting problems comparable to what students would likely face in their future professional careers.

Dellaportas and Hassall (2013) described an experiential learning exercise extended to students in their final year of an accounting degree program that included visits to a prison to meet with inmates who were former professional accountants. Students learned about the potential ethical dilemmas that professional accountants face, fraud and consequences and tactics for dealing with both. Paid work-integrated learning (WIL) for a period of six or 12 months was found to provide a valuable experiential learning opportunity for students especially if processes for placement, training, supervision, and performance reviews were in place (Elijido-Ten and Kloot, 2015). Twyford and Dean (2023) also support the need for WIL in accounting education to add the real-world component deemed essential. Further, Reid, Butler, Comfort, and Potter (2023) reported that virtual WIL or internships helped to develop student confidence.

Killian, Fabiola, Huber, and Brandon (2022) documented use of an ethics interview exercise concluding that the

interview provided students an opportunity for professional engagement. In audit education, Drake (2011) examined the use of "living cases" that tell "corporate failure stories from the media". Drake suggests that this type of case would be relevant to what is currently happening in the industry as opposed to traditional cases that are historical in nature. Drake (2011) also noted that the "living case" mirrors Kolb's experiential learning theory cycle by providing the concrete experiences that produce observations and promote reflection, driving students to reason and deliberate to formulate a plan that is put into action. Butler, Church, and Wheeler (2019, 17) suggest a variety of resources and activities to facilitate "more critical thinking and problem-solving activities in their courses through experiential education" including simulations and work-integrated opportunities.

Simulations, especially virtual simulations that include work-integrated opportunities, can provide students with the opportunity to experience the work as they would in their profession. This is particularly important to students in an auditing course where simulating real-world audit tasks helps students connect theory with practice. The simulations also support Kolb's learning theory cycle – creating knowledge through the experience.

VIRTUAL EXPERIENCES IN AUDITING

Forage (now part of EAB) offers virtual experiences from three of the four largest accounting firms in the world (the "Big Four"), specifically EY, KPMG (Canada and the United States of America), and PwC (Switzerland and the United States of America). These self-paced virtual experiences are expected to take students between three and five hours to complete. Key skills that students can learn include both auditing-specific skills as well as more durable skills. Auditing-specific skills include audit planning, analytical procedures (including data visualization), understanding the client, risk assessment, professional skepticism, internal controls, audit objectives and conducting audit procedures as well as proper audit documentation. Durable skills include analytical thinking, attention to detail, critical thinking, problem solving, and professional communication (AICPA, 2018; AACSB International, 2024; Deloitte Consulting, LLP., Quinnipiac University, and AACSB International, 2024; Dolce, Emanual, Cisi, and Ghislieri, 2020; Hutson, Valenzuela, Hosto-Marti, and Wright, 2023; McCrary, 2022; and World Economic Forum, 2025). Since January 2024, 7,832 U.S college students have completed a Forage audit virtual experience, 362 institutions of higher learning in the United States of America have used a Forage audit virtual experience with their students, while 588 institutions of higher learning globally have used a Forage audit virtual experience. Table 1 below provides a brief (partial) description of each of the five virtual experiences, along with key skills, number of tasks and estimated completion time for each virtual experience.

Table 1: Auditing Virtual Experience Partial Description and Key Skills (source: Forage)

Virtual Experience	Brief Description	Key Skills	Number of Tasks	Estimated Completion Time
EY Audit	During this simulation, you will have the chance to complete tasks that mirror the work of an EY audit team member, including considering potential impacts on audit strategy, discussing testing approaches and results with team members, and interacting with representatives from companies audited by EY teams. Available at https://www.theforage.com/simulations/ey/audit-k5kl	Sustainability reporting, Fraud alertness, Digital fluency, Analytical thinking, continuous risk assessment, client and sector understanding, professional judgment, professional skepticism, detail orientation, communication with impact	4	3-4 hours

Table 1 continued:

Virtual Experience	Brief Description	Key Skills	Number of Tasks	Estimated Completion Time
KPMG Canada: Experience a Day in KPMG Audit and Assurance	With this program, get ready to gain a unique insight into what a day is like working at KPMG in our Audit & Assurance practice. Each of the tasks will help set you up for success at the firm to gain an advantage as you start your career. Available at https://enterprise.theforage.com/simulations/kpmg-ca/audit-assurance-el6n	[CPA] Licensing, KPMG opportunities, Excel, Analytics, Trial Balance review, Communication, Critical Thinking, Control Design, Fieldwork, Power BI, Reporting	5	3-4 hours
KPMG US Career Catalyst: Audit	In this immersive job simulation, you'll step into the shoes of a KPMG employee and learn from our very own team of experts. They'll help you grow your knowledge and skills by simulating the type of work our audit professionals do every day. After each module, you can compare your work with real solutions created by the KPMG team, providing a more holistic picture of Audit and the role technology plays in creating accurate results. Available at https://enterprise.theforage.com/simulations/kpmg-us/audit-gsyv	Critical thinking, problem solving, audit deliverable, Excel, audit planning, data visualization, analytical procedures, effective presentations, communications, pivot tables, business processes, internal controls, PowerPoint, video presentations	6	3-4 hours
PwC Switzerland Audit	PwC's Audit Job Simulation lets you tackle an audit case to experience our work. It will give you a feel of what it would be like to be part of the Audit, experience our international teams and the atmosphere and give you insights into what awaits you in a career in audit. Available at https://enterprise.theforage.com/simulations/pwc-ch/audit-vety	Risk analysis, audit planning, audit acceptance procedures, balance sheet/income statement review, business analysis framework, internal/external info sources, risk minimization, trivial threshold, uncorrected misstatement, occurrence/completeness, analytical procedures/case checks, individual cases, general ledger/subledgers, fraudulent activities, professional skepticism, audit objectives, audit procedures	6	4-5 hours

Table 1 continued:

Virtual Experience	Brief Description	Key Skills	Number of Tasks	Estimated Completion Time
PwC US Audit	During this program, you will get the opportunity to step into the shoes of a PwC team member and complete tasks that replicate the work that a PwC Audit team does. You'll immerse yourself in tasks regarding purchasing processes, testing execution, process documentation, compliance analysis, issue identification, and more. Available at https://enterprise.theforage.com/simulations/pwc-us/audit-w3fr	Policy interpretation, compliance analysis, testing execution, documentation, analysis, communication, issue identification, client meetings, process documentation, control documentation	4	3-4 hours

MAPPING THE AUDITING VIRTUAL EXPERIENCES TO THE AICPA UNIFORM CPA EXAMINATION® BLUEPRINTS

The AICPA released the blueprints for the new CPA examination that went into effect in January 2024. The new CPA examination consists of three Core examinations and one Discipline examination. Specifically, AICPA (2023, 2) states that

> The CPA licensure model requires all candidates to pass three Core exam sections and one Discipline exam section of a candidate's choosing. The Uniform CPA Examination (the Exam) has been designed accordingly as reflected in the Exam Blueprints. The Core exam sections assess the knowledge and skills that all newly licensed CPAs (nlCPAs) need in their role to protect the public interest. The Discipline exam sections assess the knowledge and skills in the respective Discipline domain applicable to nlCPAs [newly licensed CPAs] in their role to protect the public interest.
>
> The three Core exam sections, each four hours long, are: Auditing and Attestation (AUD), Financial Accounting and Reporting (FAR) and Taxation and Regulation (REG). The three Discipline exam sections, each four hours long, are: Business Analysis and Reporting (BAR), Information Systems and Controls (ISC) and Tax Compliance and Planning (TCP).

The score weights on the Auditing and Attestation (AUD) Core examination consist of 50% Multiple-Choice Questions (MCQs) and 50% Tasked-Based Simulations (TBSs). In addition, the "AICPA adopted a skill framework for the Exam based on the revised Bloom's Taxonomy of Educational Objectives" (Anderson, Krathwohl, Airasian, Cruikshank, Mayer, Pintrich, Raths, and Wittrock, 2001; Bloom, Engelhart, Furst, Hill, and Krathwohl, 1956) (AICPA, 2023, 2). For the AUD Core examination, the skills levels assessed are 30-40% Remembering and Understanding (defined as "the perception and comprehension of the significance of an area utilizing knowledge gained"), 30-40% Application (defined as "the use or demonstration of knowledge, concepts or techniques"), 15-25% Analysis (defined as "the examination and study of the interrelationships of separate areas in order to identify causes and find evidence to support inferences"), and 5-15% Evaluation (defined as "the examination or assessment of problems, and use of judgment to draw conclusions") (AICPA, 2023, 3). Evaluation is a skill only assessed on the AUD Core examination, it is not assessed on any of the other Core examinations (FAR, or REG) nor is it assessed on any of the three Discipline examinations (BAR, ISC, and TCP). There are four content areas tested on the AUD Core examination: Area I – Ethics, Professional Responsibilities and General Principles, 15-25%, Area II – Assessing Risk and Developing a Planned Response, 25-35%, Area III – Performing Further Procedures and Obtaining Evidence 30-

40%, and Area IV – Forming Conclusions and Reporting, 10–20% (AICPA, 2023, AUD2). The following table summarizes the weights placed on content areas and skills (AICPA, 2023, AUD6).

Table 2: Content and Skill Weights on Auditing and Attestation (AUD) Core Examination as specified in the AICPA Uniform CPA Examination® Blueprints

Area	Auditing and Attestation (AUD) Content	Weight
I	Ethics, Professional Responsibilities and General Principles	15-25%
II	Assessing Risk and Developing a Planned Response	25-35%
III	Performing Further Procedures and Obtaining Evidence	30-40%
IV	Forming Conclusions and Reporting	10-20%
	Auditing and Attestation (AUD) Skill (based on revised Bloom's taxonomy)	
	Evaluation	5-15%
	Analysis	15-25%
	Application	30-40%
	Remembering and Understanding	30-40%

Table 3 below maps the key skills students can learn in each virtual experience in auditing to the content area on the AUD Core Examination. In addition, it also maps these key skills to the revised Bloom's taxonomy used by the AICPA. In terms of content, Areas II (Assessing Risk and Developing a Planned Response) and III (Performing Further Procedures and Obtaining Evidence) are covered in each of the five virtual experiences. In fact, the EY, the KPMG Canada, and the PwC US virtual experiences consist entirely of coverage of these two areas. In contrast, the KPMG US and the PwC Switzerland virtual experiences provide some coverage of all four areas. In terms of skills based on the revised Bloom's taxonomy, each of the five virtual experiences cover each of the four skills (Remembering and Understanding, Application, Analysis, Evaluation).

Table 3: Mapping of Auditing Virtual Experience Key Skills to AICPA Uniform CPA Examination® Blueprints (Auditing and Attestation or AUD section)

Virtual Experience	Key Skills as Specified by Forage	AUD Content Area based on Type of Tasks	AUD Revised Bloom's Taxonomy Skills
EY Audit	Sustainability reporting, fraud alertness, digital fluency, analytical thinking, continuous risk assessment, client and sector understanding, professional judgment, professional skepticism, detail orientation, communication with impact	Area II. A. Planning an engagement	Remembering and Understanding + Application
		Area II. B. Understanding an entity and its environment	Remembering and Understanding + Application + Analysis + Evaluation
		Area II. C. Understanding an entity's control environment and business processes, including information technology (IT) systems	Remembering and Understanding + Application + Analysis + Evaluation
		Area II. D. Materiality	Remembering and Understanding + Application + Analysis

Table 3 continued

Virtual Experience	Key Skills as Specified by Forage	AUD Content Area based on Type of Tasks	AUD Revised Bloom's Taxonomy Skills
EY Audit (continued)		Area II. E. Assessing and responding to risks of material misstatement, whether due to fraud or error Area III. D. Procedures to obtain sufficient appropriate evidence	Application + Analysis Application + Analysis + Evaluation
KPMG Canada: Experience a Day in KPMG Audit and Assurance	[CPA] Licensing, KPMG opportunities, Excel, Analytics, Trial Balance review, Communication, Critical Thinking, Control Design, Fieldwork, Power BI, Reporting	Area II. B. Understanding an entity and its environment Area II. C. Understanding an entity's control environment and business processes, including information technology (IT) systems Area II. E. Assessing and responding to risks of material misstatement, whether due to fraud or error Area III. A. Use of data and information Area III. D. Procedures to obtain sufficient appropriate evidence	Remembering and Understanding + Application Remembering and Understanding + Application + Analysis + Evaluation Application + Analysis Remembering and Understanding + Application + Analysis Application + Analysis + Evaluation
KPMG US Career Catalyst: Audit	Critical thinking, problem solving, audit deliverable, Excel, audit planning, data visualization, analytical procedures, problem solving, effective presentations, communications, pivot tables, business processes, internal controls, PowerPoint, video presentations	Area I. F. Communication with management and those charged with governance Area II. D. Materiality Area II. C. Understanding an entity's control environment and business processes, including information technology (IT) systems	Remembering and Understanding + Application Remembering and Understanding + Application Remembering and Understanding + Application + Analysis + Evaluation

Table 3 continued

Virtual Experience	Key Skills as Specified by Forage	AUD Content Area based on Type of Tasks	AUD Revised Bloom's Taxonomy Skills
KPMG US Career Catalyst: Audit (continued)		Area III. D. Procedures to obtain sufficient appropriate evidence	Application + Analysis
		Area IV. A. Reporting on audit engagements	Remembering and Understanding + Application
PwC Switzerland Financial Audit Virtual Case Experience	Risk analysis, audit planning, audit acceptance procedures, balance sheet/income statement review, business analysis framework, internal/external info sources, risk minimization, trivial threshold, uncorrected misstatement, occurrence/completeness, analytical procedures/case checks, individual cases, general ledger/subledgers, fraudulent activities, professional skepticism, audit objectives, audit procedures	Area I. B. Professional Skepticism and Professional Judgment	Remembering and Understanding
		Area I. C. Nature and scope	Remembering and Understanding
		Area I. D. Terms of engagement	Remembering and Understanding + Application
		Area I. F. Communication with management and those charged with governance	Remembering and Understanding + Application
		Area II. B. Understanding an entity and its environment	Remembering and Understanding + Application
		Area II. D. Materiality	Remembering and Understanding + Application
		Area II. E. Assessing and responding to risks of material misstatement, whether due to fraud or error	Application + Analysis
		Area III. A. Use of data and information	Remembering and Understanding + Application + Analysis
		Area III. B. Sufficient appropriate evidence	Application + Analysis + Evaluation
			Application + Analysis

Table 3 continued

Virtual Experience	Key Skills as Specified by Forage	AUD Content Area based on Type of Tasks	AUD Revised Bloom's Taxonomy Skills
PwC Switzerland Financial Audit Virtual Case Experience (continued)		Area III. D. Procedures to obtain sufficient appropriate evidence Area IV. A. Reporting on audit engagements	Remembering and Understanding + Application
PwC US Audit	Policy interpretation, compliance analysis, testing execution, documentation, analysis, communication, issue identification, client meetings, process documentation, control documentation	Area II. A. Planning an engagement Area II. B. Understanding an entity and its environment Area II. C. Understanding an entity's control environment and business processes, including information technology (IT) systems Area II. E. Assessing and responding to risks of material misstatement, whether due to fraud or error Area III. D. Procedures to obtain sufficient appropriate evidence	Remembering and Understanding + Application Remembering and Understanding + Application Remembering and Understanding + Application + Analysis + Evaluation Application + Analysis Application + Analysis

ALIGNMENT TO AACSB INTERNATIONAL BUSINESS AND ACCOUNTING ACCREDITATION STANDARDS

AACSB International Business Accreditation Standards

The AACSB International standards for business education Standard 4 (specifically 4.3) states that the AACSB International anticipates that the "school's curriculum promotes and fosters innovation, experiential learning" and further specifies that "Experiential learning includes a wide variety of activities such as internships," and states that it is expected that the university provides "a portfolio of experiential learning opportunities" to business (including accounting) students (Standard 4, AACSB International, 2025b, 40, 42). The AACSB International also recommends that the "Curriculum should include experiential learning opportunities, including those that facilitate the connection between academic and professional experiences" (AACSB International, 2025c, 29). These virtual experiences enable students to obtain experience at the large international accounting firms in a new and innovative manner, thereby increasing student engagement, and strengthening the connection between academic and professional experiences. In addition, surveying students who have completed such virtual experiences can provide business schools with an indirect measure of learning for assurance of learning purposes (Standard 5, AACSB International, 2024b, 44-45, and AACSB International, 2025c, 32).

AACSB International Accounting Accreditation Standards

AACSB International's standards for separate accounting accreditation encourage "active learner engagement" and emphasize the importance of experiential education by noting that it is expected that "accounting learners… engage in experiential and active learning designed to improve skills and the application of knowledge" (Standard A3, AACSB International, 2025a, 15). In addition, Standard A5 also notes the importance of experiential learning and engagement of learners (AACSB International, 2025a, 23). These virtual experiences enable students to engage in experiential learning, thereby increasing their engagement in the learning process, thus helping accounting programs satisfy both Standard A3 and Standard A5 for separate AACSB International accounting accreditation.

IMPLEMENTATION GUIDANCE

These virtual auditing experiences can be used in both introductory and in advanced auditing courses. They may also be used in graduate auditing courses. Table 4 below provides implementation guidance for incorporating these virtual experiences into auditing classes. Many institutions offer only one undergraduate auditing course (Introductory Auditing), and we believe that each of these virtual experiences in auditing can be successfully adopted for use in such undergraduate auditing courses. These virtual experiences can also be successfully incorporated in Advanced Auditing courses (typically offered at the graduate level) which often include substantive testing of different accounts and transaction cycles. One option is to include at least one virtual experience in each of the auditing courses. Another option is to incorporate one or more virtual auditing experience in each auditing course. Some of these virtual experiences may contain topics that may not have been covered fully before (e.g., sustainability reporting in the EY Audit virtual experience) and the virtual experience can serve as an innovative introduction to such topics in an auditing course. We use the Arens, Elder, Beasley, and Hogan (2024) and the Whittington and Pany (2024) auditing textbooks as a reference in Table 4.

Forage shares some reviews (out of thousands) by students on its website for each auditing virtual experience. Such feedback includes comments such as "this case experience has definitely increased my understanding of assurance. It helped me really get involved in developing my skills" (student from the University of Delaware), "The experience is really insightful and puts together the theory with the practical. Being submerged into a real life [sic] scenario has developed my understanding of the audit procedure [sic]" (student from the University of Leeds in the United Kingdom), "PwC Switzerland Financial Audit Virtual Case Experience provides a quick overview of how an audit is carried out in practise [sic]. This training has assisted me in applying theoretical information to case studies. It is an ideal course for any student before joining the audit sector…" (no affiliation reported by student), "One thing I really appreciated was the interactive approach where students can learn by performing practical examples and understand what a staff accountant's tasks may look like" (student from the University of Toronto in Canada), "I loved gaining the exposure into a mock day at KPMG. I learned a lot of out of classroom knowledge to use in my professional career and grow from this module. The resources and links were also a good exposure into learning more about the industry and tools used within this role" (student from the University of Waterloo in Canada), "Participating in the PwC Audit Job stimulation has provided me with valuable insights into the operations of PwC Audit, as well as the effective auditing process, which includes control testing and conducting walkthroughs with clients" (no affiliation reported by student), "I like I got to learn about audit. As [sic] senior accounting student, I thought I wanted to do tax, but auditing is more fun. I think it cool in auditing you get to run test [sic] to check the internal controls. Because if issues are not caught it can cause millions of dollars to fix it" (student from Middle Georgia State University), "I thought it was very helpful that they provided templates in each task, then once you completed the task, the gave an example of how they would have completed it so you can compare your work" (student from Providence College), and "loved that I was exposed to the real world of auditing. It was an exciting experience, applying what I have been learning at varsity in the real world. It gave me exposure as to what one is to expect as I undergo in my career. Thank you for the opportunity" (student from the University of Pretoria in South Africa).

Table 4: Implementation Guidance for Incorporating Auditing Virtual Experiences

Virtual Experience	Key Skills	Implementation
EY Audit	Sustainability reporting, Fraud alertness, Digital fluency, Analytical thinking, continuous risk assessment, client and sector understanding, professional judgment, professional skepticism, detail orientation, communication with impact	Use after coverage of planning the audit, including understanding of the entity and its environment, and assessing risks of material misstatement After Chapter 13 in the Arens, Elder, Beasley, and Hogan (2024) textbook, or after Chapter 8 in the Whittington and Pany (2024) textbook
KPMG Canada: Experience a Day in KPMG Audit and Assurance	[CPA] Licensing, KPMG opportunities, Excel, Analytics, Trial Balance review, Communication, Critical Thinking, Control Design, Fieldwork, Power BI, Reporting	Use after coverage of internal controls in addition to coverage of audit planning After Chapter 14 in the Arens, Elder, Beasley, and Hogan (2024) textbook, or after Chapter 8 in the Whittington and Pany (2024) textbook Note that one of the tasks in this virtual experience requires students to use Power BI to investigate trends in revenue. However, the instructor can ask students to use Excel instead Note that this virtual experience is from KPMG Canada and provides students with the opportunity to learn about auditing in Canada adding an international flavor to their auditing course
KPMG US Career Catalyst: Audit	Critical thinking, problem solving, audit deliverable, Excel, audit planning, data visualization, analytical procedures, effective presentations, communications, pivot tables, business processes, internal controls, PowerPoint, video presentations	Use after coverage of audit of accounts receivable, as a couple of tasks require students to use confirmations sent to third parties After Chapter 19 in the Arens, Elder, Beasley, and Hogan (2024) textbook, or after Chapter 11 in the Whittington and Pany (2024) textbook

Table 4 continued

Virtual Experience	Key Skills	Implementation
KPMG Canada: Experience a Day in KPMG Audit and Assurance	[CPA] Licensing, KPMG opportunities, Excel, Analytics, Trial Balance review, Communication, Critical Thinking, Control Design, Fieldwork, Power BI, Reporting	Use after coverage of internal controls in addition to coverage of audit planning After Chapter 14 in the Arens, Elder, Beasley, and Hogan (2024) textbook, or after Chapter 8 in the Whittington and Pany (2024) textbook Note that one of the tasks in this virtual experience requires students to use Power BI to investigate trends in revenue. However, the instructor can ask students to use Excel instead Note that this virtual experience is from KPMG Canada and provides students with the opportunity to learn about auditing in Canada adding an international flavor to their auditing course
KPMG US Career Catalyst: Audit	Critical thinking, problem solving, audit deliverable, Excel, audit planning, data visualization, analytical procedures, effective presentations, communications, pivot tables, business processes, internal controls, PowerPoint, video presentations	Use after coverage of audit of accounts receivable, as a couple of tasks require students to use confirmations sent to third parties After Chapter 19 in the Arens, Elder, Beasley, and Hogan (2024) textbook, or after Chapter 11 in the Whittington and Pany (2024) textbook
PwC Switzerland Audit	Risk analysis, audit planning, audit acceptance procedures, balance sheet/income statement review, business analysis framework, internal/external info sources, risk minimization, trivial threshold, uncorrected misstatement, occurrence/completeness, analytical procedures/case checks, individual cases, general ledger/subledgers, fraudulent activities, professional skepticism, audit objectives, audit procedures	Use after coverage of audit of accounts receivable, as one task requires students to identify audit objectives and related procedures for auditing trade receivables After Chapter 19 in the Arens, Elder, Beasley, and Hogan (2024) textbook, or after Chapter 11 in the Whittington and Pany (2024) textbook Note that this virtual experience is from PwC Switzerland and provides students with the opportunity to learn about auditing in Switzerland adding an international flavor to their auditing course

Table 4 continued

Virtual Experience	Key Skills	Implementation
PwC US Audit	Policy interpretation, compliance analysis, testing execution, documentation, analysis, communication, issue identification, client meetings, process documentation, control documentation	Use after coverage of internal controls in addition to coverage of audit planning After Chapter 14 in the Arens, Elder, Beasley, and Hogan (2024) textbook, or after Chapter 8 in the Whittington and Pany (2024) textbook

CONCLUSION

One of the challenges of teaching an auditing course is keeping students engaged in the learning process by helping them understand how the concepts covered in the course are applied in practice. The literature on experiential learning suggests that incorporating experiential learning opportunities into courses can improve student engagement and enhance their learning by helping them understand the connection between theory and practice. The virtual audit experiences presented in this paper provide an excellent experiential learning activity that can be easily integrated into both undergraduate and graduate courses to accomplish this goal. The simulations incorporate real-world virtual audit experiences created through partnerships between Forage and three of the world's leading accounting firms that are provided to faculty and students at no cost. As outlined in this paper, there are five simulations that align with the audit content tested on the new CPA exam, elements of Bloom's Taxonomy, and AACSB accreditation requirements. These simulations teach students a variety of audit related skills needed to work as part of a team in the planning and execution of an audit. They also incorporate durable skills such as critical thinking, analytical thinking, attention to detail, problem solving, and professional communication. As discussed in this paper, there are multiple ways these simulations may be incorporated into various auditing courses. The success of these simulations is evident from feedback provided by students who have completed these simulations in auditing courses at various universities and reported that the simulations were very engaging, helped them develop skills, enhanced their understanding of how the concepts they learned in class apply to a real-world audit, and piqued their interest in auditing as a career.

REFERENCES

AACSB International. (2025a). *2018 Standards for Accounting Accreditation, Updated February 28,2025*. Available at https://www.aacsb.edu/educators/accreditation/business-accreditation/accounting-accreditation.

AACSB International. (2025b). *2020 Guiding Principles and Standards for Business Accreditation, Updated February 28,2025*. Available at https://www.aacsb.edu/educators/accreditation/business-accreditation/aacsb-business-accreditation-standards.

AACSB International. (2025c). *2020 Interpretive Guidance for AACSB International Business Accreditation, Updated February 28,2025*. Available at https://www.aacsb.edu/educators/accreditation/business-accreditation/aacsb-business-accreditation-standards.

AACSB International. (2024). *What Can Business Schools and Industry Do Together?* Available at https://www.aacsb.edu/insights/articles/2024/03/what-can-business-schools-and-industry-do-together.

Accounting Education Change Commission (AECC). 1990. *Objectives of Education for Accountants. Position Statement No. 1*. Sarasota, FL: American Accounting Association.

AICPA. (2018). *AICPA Pre-Certification Core Competency Framework*. Available at https://www.thiswaytocpa.com/collectedmedia/files/core-competency-framework.pdf.

AICPA. (2023). *Uniform CPA Examination® Blueprints: Approved by the Board of Examiners American Institute of CPAs Dec. 1, 2022. Effective date: January 2024*. Available at https://www.aicpa-cima.com/resources/article/learn-what-is-tested-on-the-cpa-exam.

Albrecht, W.S. and Sack, R.J. (2000). Accounting education: Charting the course through a perilous future. *Accounting Education Series*. V. 16., Sarasota, FL: American Accounting Association.

Anderson, L.W. (Ed.), Krathwohl, D.R. (Ed.), Airasian, P.W., Cruikshank, K.A., Mayer, R.E., Pintrich, P.R., Raths, J., and Wittrock, M.C. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's Taxonomy of Educational Objectives (Complete Edition)*. New York: Longman.

Arens, A.A., Elder, R.J., Beasley, M.S., and Hogan, C.E. (2024). *Auditing and Assurance Services, 18th edition*. New York, NY: Pearson.

Bloom, B.S. (Ed.), Engelhart, M.D., Furst, E.J., Hill, W.H., and Krathwohl, D.R. (1956). *Taxonomy of educational objectives: The classification of educational goals*. Handbook 1: Cognitive domain. New York: David McKay.

Brown, A.M. (2015). Simulations in Undergraduate Mental Health Nursing Education: A Literature Review. *Clinical Simulation in Nursing.* V. 11, No. 10, pp. 445-449.

Burton, K.J., and McNamara, J. (2009) Assessing reflection skills in law using criterion-referenced assessment. *Legal Education Review*. V. 19, No. 1-2, pp. 171-188.

Butler, M.G., Church, K.S., and Wheeler, S.A. (2019). Do, reflect, think, apply: Experiential education in accounting. Journal of Accounting Education. V. 48, pp. 12-21.

Dellaportas, S. and Hassall, T. (2013). Experiential learning in accounting education: A prison visit. *The British Accounting Review*. V. 45, pp.

24–36.
Deloitte Consulting, LLP., Quinnipiac University, and AACSB International. (2024). *Closing the Skills Gap with Dynamic Partnerships*. [White Paper]. Available at https://www2.deloitte.com/content/dam/Deloitte/us/Documents/public-sector/closing-the-skills-gap-with-dynamic-partnerships.pdf.
Dolce, V., Emanual, F., Cisi, M., and Ghislieri, C. (2020). The soft skills of accounting graduates: Perceptions versus expectations. *Accounting Education*. V. 29, No. 1, pp. 57-76.
Drake, J. (2011). Adding Value to Audit Education through 'Living' Cases. *Accounting Education: an international journal*. V. 20, No. 2, pp. 203-222.
Elijido-Ten, E. and Kloot, L. (2015). Experiential learning in accounting work-integrated learning: a three-way partnership. *Education + Training*. V. 57, No. 2, pp. 204-218.
Hutson, J., Valenzuela, M., Hosto-Marti, B., & Wright, S. (2023). The Role of Higher Education in Developing Durable Skills: Reframing General Education. *Journal of Organizational Psychology*. V. 23, No. 1, pp. 1-12.
Killian, L.J., Fabiola, M-C., Huber, M.M., and Brandon, C. (2022). The Ethics Interview: Can a Single Interview Exercise Help Students Experience the Benefits of Professional Engagement? *Issues in Accounting Education*. V. 37, No. 1, pp. 59-77.
Kolb, D. A. (1984). *Experiential learning: experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice Hall.
Kolb, D. A. (1976). Management and the learning process. *California Management Review*. V. 18, No. 3, pp. 21–31.
Kolb, A. Y., & Kolb, D. A. (2017). Experiential learning theory as a guide for experiential educators in higher education. *Experiential Learning & Teaching in Higher Education*. V. 1, No. 3, pp. 7-44.
Koivisto, J., Niemi, H., Multisilta, J., and Eriksson, E. (2017). Nursing students' experiential learning processes using an online 3D simulation game. *Education and Information Technologies Journal*. V. 22, No. 1, pp. 383–398.
Kumar, R., and Preiser-Houy, L. (2024). Co-Curricular Experiences to Enhance Business Education. *Business Education Innovation Journal*. V. 16, No. 2, pp. 124-137.
Lapidus, R., Towell, E., and Hayes, J. (2015). Evaluating Co-Curricular Success in a College of Business. *Business Education Innovation Journal*. V. 7, No. 2, pp 36-43.
Lewis, L.H., and Williams, C.J. (1994). Experiential Learning: Past and Present. *New Directions for Adult and Continuing Education*. V. 62, pp. 5-16.
Mastilak, C. (2012). First-Day Strategies for Millennial Students in Introductory Accounting Courses: It's All Fun and Games Until Something Gets Learned. *Journal of Education for Business*. V. 87, No. 1, pp. 48-51.
McCrary, S. C. (2022). Accounting curricula: Soft skills at the expense of technical competency or a happy merger of the two? *Journal of Education for Business*. V. 97, No. 3, pp. 204-212.
Reid, K., Butler, D.L., Comfort, C., and Potter, A.D.J. (2023). Virtual internships in open and distance learning contexts: Improving access, participation, and success for underrepresented students. *Distance Education*. V. 44, No. 2, pp. 267-283.
Schön, D.A. (1987). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions*. San Francisco: Jossey-Bass.
Whittington, O.R., and Pany, K. (2024). *Principles of Auditing & Other Assurance Services, 2024 release*. New York, NY: McGraw-Hill.
World Economic Forum. (2025). *Future of Jobs Report 2025*. Available at https://reports.weforum.org/docs/WEF_Future_of_Jobs_Report_2025.pdf.
Stanley, T., and Marsden, S. (2012). Problem-based learning: Does accounting education need it? *Journal of Accounting Education.* V. 30. No. 3-4, pp. 267-289.
The Pathways Commission. 2012. *Charting a National Strategy for the Next Generation of Accountants*. Sarasota, FL: American Accounting Association. Available at: https://aaahq.org/portals/0/images/education/pathways/8-9-47216.pdf?ver=2021-02-23-180351-313
The Pathways Commission. 2015. *In Pursuit of Accounting's Curricula of the Future*. Sarasota, FL: American Accounting Association. Available at: https://aaahq.org/portals/0/images/education/pathways/15-9-61866.pdf
Twyford, E., and Dean, B.A. (2023): Inviting students to talk the talk: developing employability skills in accounting education through industry-led experiences. *Accounting Education*. V. 33, No. 3, pp. 296-318.
Wood, Y.I., Zegwaard, K.E., and Fox-Turnbull, W. (2020). Conventional, remote, virtual, and simulated work-integrated learning: A meta-analysis of existing practice. *International Journal of Work-Integrated Learning, Special Issue*. V. 21, No. 4, pp. 331-354.
Yang, H., Cheung, C., and Fang, C.C. (2015). An empirical study of hospitality employability skills: perceptions of entry-level hotel staff in China. *Journal of Hospitality & Tourism Education*. V. 27, No. 4, pp. 161-170.

Aamer Sheikh, Ph.D. CPA, CCS, CRFAC®, DABFA®, CGMA® is Professor of Accounting in the School of Business at Quinnipiac University. Aamer can be reached at aamer.sheikh@quinnipiac.edu.

Kathleen Simione, M.B.A., CPA is Visiting Associate Professor of Accounting, Associate Professor of Accounting Emerita and Director Emeritus of M&T Bank Center for Women and Business in the School of Business at Quinnipiac University. Kathy can be reached at kathleen.simione@quinnipiac.edu.

Kenneth Ryack, Ph.D., CPA, CFP® is Professor of Accounting in the School of Business at Quinnipiac University. Ken can be reached at kenneth.ryack@quinnipiac.edu.

Harrison Bass, M.A. is Global Head of Educational Partnerships at Forage, part of EAB. Harrison is happy to help faculty incorporate the use of these free virtual experiences in their courses. The virtual experiences are available at www.theforage.com. Harrison can be reached at HBass@eab.com.

Serving Up Entrepreneurship: The Food Truck Experience as a Pedagogical Innovation

Silviana Falcon, Florida Southern College, Lakeland, FL, U.S.A.
J. Michael Tracy, Florida Southern College, Lakeland, FL, U.S.A.

ABSTRACT

This article presents an integrated experiential learning module designed to introduce first-semester freshman business students to entrepreneurship in action. Developed as a core component of Florida Southern College's Barney Barnett School of Business and Free Enterprise (BBSBFE) first-year learning community, the module combines simulation, live events, and reflective journaling to create an immersive learning experience. By establishing a shared foundation for business concepts such as branding, pricing, and customer service, the module supports deeper engagement and application in subsequent coursework. The case study highlights the background, implementation, and outcomes of the Food Truck Experience, with data demonstrating its effectiveness in fostering entrepreneurial mindset, critical thinking, and collaboration. The adaptability of the module as a foundational activity underscores its potential as a replicable model for institutions seeking to enhance student engagement, skill development, and long-term academic success.

Keywords: Entrepreneurial mindset, reflective journaling, collaborative learning, student engagement, experiential pedagogy.

INTRODUCTION

Student engagement and the entrepreneurial mindset are central to contemporary business education (AACSB, 2020). At Florida Southern College Barney Barnett School of Business and Free Enterprise (BBSBFE), these themes drive our mission. Designed for first-semester freshman business students, the Food Truck Experience, which combines a virtual simulation with real-world observations of business-in-practice and executive feedback, is completed within the first three weeks of the semester. This early engagement energizes students for the remaining programming, which includes a semester-long project using design thinking to develop and pitch a business idea in a Shark Tank-style competition.

The Food Truck Experience combines classroom instruction, simulation, and real-world application to introduce first-year students to entrepreneurial principles. Since 2022, it has received strong feedback, underscoring its effectiveness in fostering engagement and retention. The results support BBSBFE's academic excellence, reflected in Poets & Quants' 2021 ranking of BBSBFE as the top school for "Quality of Teaching" and its #6 rank in 2022 for "Quality of Teaching" and "Faculty Availability for Mentoring."

This article outlines the Food Truck Experience's design, implementation, and outcomes, offering insights for educators aiming to engage students through experiential learning.

BACKGROUND

As competition among colleges grows, experiential and high-impact programs are increasingly vital. BBSBFE emphasizes engaged learning and the entrepreneurial mindset—a key driver of economic growth and innovation—aligning with broader business education trends (Alkaabi & Senghore, 2024). This mindset emphasizes adaptability, resilience, and value creation, preparing students for leadership as intrapreneurs or entrepreneurs (Crosina et al., 2024).

Experiential learning enhances students' ability to apply theory to practice, fostering a deeper understanding of business dynamics (Eyler, 2009). At BBSBFE, this approach encourages students to explore and internalize concepts through interactive modules and activities (Falcon, 2021). The Food Truck Experience, which integrates the Harvard Business School Food Truck Simulation (Roberto, 2016) with live community engagement, exemplifies this philosophy.

Arvanites and Borden (2019) highlight the value of interdisciplinary and experiential projects in enhancing business education, reinforcing the importance of diverse pedagogical methods to achieve impactful outcomes. The Food Truck Experience at the Barnett School allows students to (1) interact with a virtual simulation of business management, (2) observe businesses operating at a large community gathering, and (3) incorporate executive feedback into the experiential learning process.

CASE STUDY

Each fall, BBSBFE welcomes 160-180 first-year business students into a learning community divided into 6-7 sections. The Food Truck Experience anchors a broader first-year curriculum designed to foster an entrepreneurial mindset by exploring business fundamentals, teamwork, and creative problem-solving. The module unfolds over three weeks and includes:

Classroom Briefing & Journal Writing Assignments: Students are introduced to the module's goals, focusing on the entrepreneurial mindset, business ethics, and community impact. Reflective journaling is tied to two documentaries: *Street Food: Asia* (Netflix, 2019) and *The Mega Brands That Built America* (History Channel, 2023). After selecting and watching an episode of *Mega Brands*, students engage in guided discussions on entrepreneurial lessons, such as risk-taking, learning from failure, and leveraging community resources. These discussions prepare them to reflect independently on questions like: "What insights can be applied to your aspirations?" and "How can these traits inspire your actions?"

Harvard Business School Food Truck Simulation: Students manage a virtual food truck individually and in teams, experimenting with strategies to maximize profitability. The simulation highlights pricing, customer segmentation, and resource allocation (Roberto, 2016). Journaling assignments encourage students to document their strategies and reflect on how decisions influenced outcomes, fostering strategic thinking and adaptability.

Food Truck Live Event Participation: At a "food truck rally" in Downtown Lakeland, FL, students evaluate vendors on branding, pricing, and customer service. Lakeland is a mid-sized city in Central Florida located between the large metropolitan areas of Tampa and Orlando on the "I-4 corridor." The food truck rally enables students to experience real-world business exposure that emphasizes the nuances of small business management. Journals capture observations, analyzing entrepreneurial traits and connecting them to classroom lessons.

Food Truck Observational Survey and Reflection: Students predict the most profitable food truck and document observations, challenging assumptions about profitability. Journals guide them to integrate these insights with lessons from the simulation and live event for a holistic view of entrepreneurial success.

Food Truck Debriefing Session: Michael Blasco, CEO of Tampa Food Trucks, reviews students' findings and shares vendor performance data, highlighting the link between operational efficiency and customer satisfaction. Journaling assignments, due after the debrief, encourage students to synthesize module lessons and reflect on their growth and skills for future ventures.

End-of-Module Survey: Students complete a survey measuring perceptions and learning outcomes. Questions assess how activities relate to academic objectives, enhance entrepreneurial understanding, foster peer interaction, and maintain interest in business. Students also rate their likelihood of recommending the module to peers. Quantitative survey data serves as a critical tool for assessing the module's impact and guiding improvements.

Integration and Alignment with Curriculum and Mission

The Food Truck Experience is seamlessly integrated into BBSBFE's entrepreneurial mindset-driven mission, serving as a foundational module that prepares students for future coursework, such as business planning, strategy development, and entrepreneurial finance. By engaging with real-world scenarios early in their academic journey, students build the confidence and skills necessary for more advanced business courses.

Moreover, the comprehensive nature of the module—including journaling, the Harvard Business Simulation, and live market observation—ensures that students gain a multi-faceted understanding of entrepreneurial principles. The

journaling assignments challenge students to reflect deeply on the entrepreneurial traits they observe and consider how these qualities apply to their personal aspirations, fostering introspection that supports long-term skill development. The applied nature of the simulation further complements this by providing a risk-free environment to experiment with business decisions, preparing students to navigate uncertainty and make data-driven decisions.

As students transition into subsequent coursework, they carry forward not only the technical knowledge gained from the module but also a mindset geared toward innovation and resilience. These early experiences set the stage for the semester-long Shark Tank-style competition, where students work in teams to develop a business idea using design thinking methodologies. The Food Truck Experience lays the groundwork for this capstone project by equipping students with foundational skills in teamwork, critical thinking, and creative problem-solving.

The module aligns closely with AACSB standards by fostering high-impact practices, including experiential learning and community engagement (AACSB, 2020). It also supports the BBSBFE mission of preparing students to have a positive, consequential impact through entrepreneurial mindset development and engaged learning practices (Falcon, 2021).

RESULTS

To evaluate the effectiveness of this comprehensive approach, an end-of-module survey was conducted, capturing both open-ended feedback and quantitative insights into the students' learning experiences. The following section highlights the key findings from this survey, offering evidence of the module's success in fostering entrepreneurial skills, critical thinking, and collaboration.

Quantitative Analysis

The end-of-module survey data from 2022 to 2024 provides evidence of the module's effectiveness in fostering an entrepreneurial mindset and enhancing student engagement. The survey results, drawn from 455 respondents, reveal strong positive feedback.

Table 1: Summary of 2022–2024 Survey Results

Question	% Agree	% Strongly Agree	% Overall Agree
It was obvious how the activities related to the academic objectives.	38%	56%	94%
The activities increased my understanding of entrepreneurship and its role in economic growth.	40%	53%	93%
The structure of the activities (simulation, food truck rally, and debrief) meant I could interact with my peers when learning.	27%	63%	90%
The module helped me understand the entrepreneurial mindset.	37%	54%	91%
The module helped me envision how I can apply entrepreneurial thinking.	38%	50%	88%
I benefited from engagement with classmates and/or professors through the food truck module.	32%	59%	91%
The way the food truck class materials were presented helped me maintain my interest in business.	29%	56%	86%
I would recommend the food truck module to other students starting the business major.	22%	67%	89%

Note: N = 455

The aggregated three-year data strongly suggests that the Food Truck Experience is effectively meeting its academic objectives, with consistently high scores across all key learning areas. The mode and median values of 5.00 across all questions indicate that most students rated the experience at the highest level. Additionally, mean scores for all questions remain well above 4.30 on a 5-point scale, reinforcing the module's success in engaging students and delivering key entrepreneurial concepts. Two questions—Q5 (The module helped me envision how I can apply entrepreneurial thinking, Mean = 4.36) and Q7 (The way the food truck class materials were presented helped me

maintain my interest in business, Mean = 4.38)—received directionally lower scores, suggesting areas for potential refinement in these dimensions.

Table 2: Aggregated Data Statistics by Question 2022-24

	Q1: Clear Objectives	Q2: Econ Growth	Q3: Peer Interaction	Q4: Entrep. Mindset	Q5: Entrep. Thinking	Q6: Engagement	Q7: Interest	Q8: Recommend
Mode	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Median	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Mean	4.49	4.44	4.50	4.44	4.36	4.46	4.38	4.53
Std Dev	0.65	0.67	0.76	0.70	0.76	0.75	0.82	0.77

Student Reflections: Insights from Open-Ended Survey Responses

The open-ended questions in the end-of-module survey invited students to share their perspectives on the Food Truck Experience. These responses provide valuable insight into how students internalized the module's activities and applied their learning to entrepreneurial concepts. Some students focused on marketing strategy: *"I learned how branding and visual appeal significantly impact a business's success." "The online simulation shows that there are strategies and trial and error to all businesses, the food truck rally showed that location is crucial, and the debrief showed the importance of logging data and taking customer surveys.""I found interesting ways to grab the attention of potential customers. I learned how to give and take feedback to improve a business. I also learned how to estimate profits..." "The rally highlighted the importance of customer surveys and operational efficiency." "I found it really valuable to guess which truck was the most successful, learn which factors affected sales, and how designing and advertising played a key role."*

Other students derived benefits from the simulation. Examples: *"One of the most memorable lessons I learned from the food truck simulation was the importance of experimenting before committing to a big risk. The simulation vividly illustrated how trying out different strategies and fine-tuning them can make all the difference in a high-stakes venture. It became clear that ensuring your business is visually striking...can significantly impact its success..." "The simulation showed the importance of experimenting with strategies before committing to a big risk."*

While the journey of entrepreneurship was revealed to be demanding and at times unpredictable, the experience inspired students. The Food Truck Experience has proven to be a catalyst for cultivating the entrepreneurial mindset and introducing students to the tools necessary to navigate the business environment.

Journal Reflections

A key component of the module is reflective journaling. Students analyze their experiences and draw introspective connections between the module content and their aspirations. Guided prompts encourage them to:

- Summarize challenges encountered during the module.
- Identify entrepreneurial traits such as adaptability, resilience, and innovation.
- Draw connections between theoretical concepts and practical applications.
- Reflect on personal lessons learned and their application to future entrepreneurial endeavors.

Students watch *Street Food: Asia* (Netflix, 2019) and episodes from *The Mega Brands That Built America* (History Channel, 2023) to examine the lives and achievements of entrepreneurs. One prompt asks them to reflect on lessons from these documentaries, encouraging them to explore how the stories of successful entrepreneurs influence their perceptions of entrepreneurship. Students are asked: *"What insights can be applied to your own aspirations and future ventures?"* Similarly, another prompt asks students to connect the entrepreneurial mindset demonstrated in real-world stories to their personal lives, guiding them to consider: *"How can these qualities inspire and guide your actions and choices?"*

Student Reflections
Student reflections frequently highlighted the impact of these exercises on their understanding of entrepreneurship. Many students emphasized the importance of resilience, creativity, and adaptability. As one student noted,

"The resilience and creativity shown by the street food vendors taught me that setbacks are part of the journey and overcoming them is what defines success."

Another reflected,
"The competitive drive and adaptability of these industry leaders taught me to see failure not as an endpoint, but as an opportunity to innovate and grow."

Similarly, another wrote,
"The most inspiring lesson was seeing how these entrepreneurs continuously adapted to market changes... taught me to embrace creativity and risk-taking in my own aspirations."

Drawing Lessons from Saul Price and Sam Walton
In addition to general reflections, several students drew explicitly from the lessons offered by entrepreneurs such as Saul Price and Sam Walton. Their responses demonstrated an understanding that entrepreneurial success often derives not from radical reinvention, but from strategic improvements and persistence. One student captured this insight by writing,

"The stories of these entrepreneurs show that success doesn't always come from reinventing the wheel, but from improving what already exists and persisting through failure."

Parallels to Student-Athlete Experiences
Some students also drew parallels between the entrepreneurial mindset and their experiences as student-athletes. They identified similarities in overcoming setbacks and emphasized the importance of a supportive community in achieving success. As one student reflected,

"The entrepreneurial stories inspired me to approach my goals with greater persistence and innovation, no matter the obstacles I encounter."

These parallels suggest that students were able to internalize entrepreneurial principles not only in the context of business but also across diverse aspects of their personal and academic lives.

The reflections reveal students' growing awareness of how the entrepreneurial mindset is relevant to them. Reflections provide a platform for students to internalize lessons, articulate their growth, and consider actionable future strategies. The introspective nature of these assignments deepened both understanding, application and imagining future possibilities. David Eng's work on entrepreneurial storytelling emphasizes the importance of reflection and narrative in fostering a growth mindset, adding another layer of value to these journaling exercises.

DISCUSSION

Key Takeaways from the Food Truck Experience
The Food Truck Experience has demonstrated significant success in enhancing students' understanding of entrepreneurial principles through experiential learning. The module's multi-faceted design effectively integrates theoretical concepts with hands-on experiences, reinforcing key entrepreneurial competencies. The following core takeaways highlight its impact:

- Real-World Connection – The module bridges theory and practice, allowing students to engage directly with business operations and decision-making.
- Team Collaboration – Students develop critical teamwork and problem-solving skills essential for entrepreneurial success.
- Community Engagement – Participation in local events fosters a sense of social responsibility and reinforces the impact of entrepreneurship within the broader business ecosystem.

Challenges and Areas for Improvement

While the Food Truck Experience has been highly effective, survey results suggest opportunities for further refinement. Specifically, applying entrepreneurial thinking (Q5, Mean = 4.36) and maintaining interest in business (Q7, Mean = 4.38) scored slightly lower than other areas. This feedback provides insight into areas where the module can be strengthened:

- Bridging Theory to Application – While students gain exposure to business operations, some may struggle to connect these insights to their career paths. *Recommendation:* Introduce a post-module action plan where students outline how they would apply entrepreneurial thinking in a business scenario or career setting.
- Sustaining Student Interest in Business – While engagement levels remain high, a subset of students may find the format less personally relevant. *Recommendation:* Invite guest speakers from diverse entrepreneurial backgrounds, reinforcing the relevance of entrepreneurial thinking across different career paths.

Additionally, logistical and structural challenges require ongoing attention:

- Funding and Resources – Securing funding for the Harvard Business Simulation and food truck vouchers remains a key consideration. Schools implementing similar models should present data-backed proposals highlighting academic benefits to justify continued support.
- Coordination and Scalability – Managing transportation, scheduling, and event logistics necessitates collaboration with community partners and institutional leadership. Expanding peer mentorship roles could help maintain engagement across larger student cohorts.
- Weather Resilience and Flexibility – Live events introduce the possibility of weather-related disruptions. Future iterations of the module should consider contingency planning, such as indoor venue alternatives or virtual simulations, to ensure continuity.
- Long-Term Integration – The module's adaptability allows it to serve as a foundational learning experience that connects to later coursework, reinforcing business concepts in a variety of contexts.

By refining these areas, the module will continue to serve as a high-impact learning experience, equipping students with the tools, confidence, and adaptability needed for long-term success.

CONCLUSION

The Food Truck Experience exemplifies the power of experiential learning in cultivating an entrepreneurial mindset among first-year business students. By combining simulation, live events, and expert debriefing, the module provides a comprehensive introduction to business dynamics. Reflective journaling exercises were instrumental in encouraging students to internalize key lessons, analyze challenges, and connect theoretical knowledge with practical applications.

One of the most significant strengths of the Food Truck Experience is its adaptability as a foundational activity that extends well beyond the initial module. By creating a shared, immersive experience, the module establishes a common reference point that instructors and students can draw upon throughout the curriculum. This continuity enables students to more easily understand and apply business concepts, such as brand alignment, mission statements, pricing strategies, and customer service.

As students begin developing business plans, they often reference insights gained from the simulation and live event. Early exposure to business dynamics helps them recognize the interconnectedness of concepts and apply these principles to future projects. Additionally, the activity serves as a springboard for discussions on customer-centric strategies and effective communication, allowing students to see firsthand how theory translates into practice.

We encourage other institutions to adapt and refine this model to enhance their own student engagement and outcomes. Future research will focus on longitudinal tracking of student success, additional insights from journal analyses, and broader applications of the module's framework. By continuously improving and expanding this approach, we aim to provide a meaningful, lasting impact on student learning, equipping future business leaders with the skills, mindset,

and adaptability necessary for success.

REFERENCES

AACSB. (2020). *AACSB Standards for Business Accreditation.* Retrieved from https://www.aacsb.edu/accreditation

Alkaabi, K., & Senghore, S. (2024). Student entrepreneurship competency and mindset: Examining the influence of education, role models, and gender. *Journal of Innovation and Entrepreneurship, 13*(1). https://doi.org/10.1186/s13731-024-00393-5

Arvanites, D., & Borden, C. (2019). Interdisciplinary experiential learning: A model for engaged business education. *Business Education Innovation Journal, 11*(2), 89-94.

Bender Smith, A. (2021). Professional values and marketable skills developed through service-learning: An analysis of business students' perceptions. *Global Journal of Business Pedagogy, 5*(1), 43–69. https://doi.org/10.47177/gjbp.05.01.2021.043

Crosina, E., Frey, E., Corbett, A., & Greenberg, D. (2024). From negative emotions to entrepreneurial mindset: A model of learning through experiential entrepreneurship education. *Academy of Management Learning & Education, 23*(1), 88–127. https://doi.org/10.5465/amle.2022.0260

Eng, D. (2021). *Entrepreneurial Storytelling for Growth: Podcasts and Practices.* Retrieved November 14, 2024, from https://podcasts.apple.com/us/podcast/experience-points/id1498702038

Eyler, J. (2009). *The Power of Experiential Education.* Retrieved November 14, 2024.

Falcon, S. (2021). *Lectures and Play: A Practical Guide to Create Extraordinary Higher Education Classroom Experiences.* New Degree Press. Retrieved from https://www.amazon.com/dp/B09XYZ

Food Truck Catering, scheduling and food truck rentals. (n.d.). Retrieved from https://tampabayfoodtruckrally.com/

History Channel. (2023). *The Mega Brands That Built America.* Retrieved from https://www.history.com/shows/the-mega-brands-that-built-america/season-1/episode-1

Lesane-Brown, C., & King, S. (n.d.). William M. Burke Award. *William M. Burke Presidential Award for Excellence in Experiential Education.* Retrieved from https://www.societyforee.org/william-m-burke-award

Netflix. (2019). *Street Food.* Retrieved from https://www.netflix.com/title/81249665

Roberto, M. A. (2016, June 9). *New Venture Simulation: The Food Truck Challenge.* Harvard Business Publishing Education. Retrieved from https://hbsp.harvard.edu/product/7201-HTM-ENG

Schmitt, J. (2021, April 2). 100 Best & Brightest Business Majors of 2021. *Poets&Quants for Undergrads.* Retrieved from https://poetsandquantsforundergrads.com/students/100-best-brightest-business-majors-of-2021/

Silviana Falcon, DHA is the Associate Provost of Strategic Business Partnerships at Florida Southern College. She also serves as an Associate Professor of Business Administration in the Barney Barnett School of Business and Free Enterprise. Her major areas of scholarly activity are innovative pedagogy and human resiliency. Her articles on human resiliency have been published by the Harvard Business Review. She is the author of the book titled *Lectures and Play: A Practical And Fun Guide To Create Extraordinary Higher Education Classroom Experiences.* She has also authored a textbook titled *From Ideas to Impact- Exploring Business Design Thinking (Kendall Hunt).*

J. Michael Tracy, M.B.A. is Executive in Residence in the Barney Barnett School of Business and Free Enterprise. His professional background includes senior executive positions with The Walt Disney Company, The Home Depot and Brown-Forman. His research interests include leadership/mentorship and internships

In Consideration of Space and Time: Factors Influencing Ethical Decisions in Early-Career Accounting Students

Ricki Livingston, University of Connecticut – Storrs, Connecticut, USA

ABSTRACT

This study uses recent innovations in education to examine how work location and decision time influence ethical decisions in early-career accounting. Grounded in the Fraud Triangle Theory, the research hypothesizes that both situational factors impact ethical decision quality, with professional experience and gender as potential moderators. Using data from 172 Masters of Accounting students over two years, the study analyzes responses to ethical dilemma scenarios through descriptive statistics and hierarchical regression analysis. Results indicate that students who are collocated and use less deliberation time may make better ethical decisions. These findings contribute to pedagogical literature by highlighting the role of work location and decision time in ethical reasoning. Additionally, the study provides insights for universities, CPAs and accounting firms, emphasizing the importance of ethical awareness, worker oversight, and workload management to maintain ethical decision-making standards.

Keywords: professional accounting, ethics, fraud triangle theory, decision quality, deliberation, decision making, time, and AICPA Code of Professional Conduct

INTRODUCTION

The concept of integrity in professional accounting through sound ethical decision making has been prevalent in behavioral accounting and finance literature for some time. The practice of accounting touches every facet of business operations, serving as the common thread interwoven throughout stakeholders both within the practice and external to the practice. The public accounting profession is unique from that of medical doctors or lawyers in that the public accountant is not only obliged to serve their clients, but also their colleagues and the public at-large. Due to the fiduciary nature of the profession, certified public accountants (CPAs) are held to elevated ethical standards as governed by the principles and rules of the American Institute of Certified Public Accountants (AICPA) Code of Professional Conduct (CPC).

The primary objective of professional accounting is to provide accurate and reliable information so that all economic stakeholders have the best opportunity to make well-informed business decisions. Failure to maintain integrity results in derogatory events that are minor, such as the use of a company-issued computer for checking personal email, or severe, such as scandals akin to Enron. Given that unethical decisions may severely impact individuals (e.g., loss of income, incarceration for fraud) or organizations (e.g., bankruptcy, massive layoffs), ethical decision making in professional accounting has received increased attention (Ness & Connelly, 2017). Schroeder, Clark, and Cathey (2017) note: "If behavioral finance [accounting] is to be successful in understanding financial institutions and participants, and if individuals and policy-makers want to make better decisions, they must take into account the true nature of people with their imperfections and bounded rationality."

Work Location: Collocated Versus Remote

Due to employee demands for increased flexibility, coupled with the pressure of cutting expenses through staff reduction, the accounting profession is undergoing a radical transition in work force operations. It is increasingly common for accountants to abandon collocated office environments in exchange for remote work environments. The 2024 Deloitte Gen Z and Millennial Survey reports a strong call for continued attention to work/life balance through flexible work arrangements. Flexible work arrangements include options such as remote work, compressed workweeks, flex space (hoteling), job sharing and reduced workloads. A survey conducted by Knight and Taylor (2020) finds that accountants perceive an overall net benefit to flexible work arrangements. The survey also reveals a belief by accountants that flexible work arrangements would not be abused, productivity would not suffer, and the arrangements are effective for both low-level and high-level positions.

The COVID-19 pandemic significantly transformed both educational institutions and the accounting profession by accelerating the shift from traditional collocated workplaces to remote work environments. The sudden shift to online classes during the COVID-19 pandemic forced universities to rapidly adopt digital learning platforms, often without

sufficient time to develop robust academic integrity policies. Institutions struggled to ensure ethical behavior as remote assessments increased opportunities for cheating, plagiarism, and unauthorized collaboration (Iqbal et al., 2021). To address these challenges, universities implemented proctoring software, honor codes, and revised assessment strategies, but concerns over effectiveness persisted.

Likewise, accounting firms rapidly adopted cloud-based accounting software, digital auditing tools, and virtual collaboration platforms to maintain financial reporting and compliance functions while adhering to social distancing measures (Al-Hiyari et al., 2021). While remote work improved flexibility and reduced operational costs, it also introduced challenges such as data security risks, reduced informal knowledge sharing, and difficulties in supervising junior accountants (Tiron-Tudor et al., 2021). Additionally, the shift raised concerns about maintaining professional skepticism and ethical decision-making in audit and financial reporting, as reduced in-person interactions may affect professional judgment and fraud detection (Bryce et al., 2021). As the profession moves toward hybrid work models, understanding the long-term implications of remote work on audit quality, regulatory compliance, and ethical considerations remains a crucial area for future research.

Deliberation Time

Professional accounting is reputed for certain problematic characteristics. Elevated course requirements for CPA licensure, crushing workloads, and pay lower than similar professions such as finance and technology, are long-standing concerns. This negative reputation results in students electing for alternative degrees. Over the last decade, there has been an alarming reduction in professional accountants even in the face of predicted economic growth (McCabe, Cohn, Browning, Russell, & Stimpson, 2017). As a result of the shift in the workforce, professional accountants incur additional workload, and subsequently, a new variation of time for deliberation and consideration of implications when faced with ethical dilemmas.

Due to technological advances, today's entry-level accountants are now expected to have both the basic knowledge of accounting and advanced data analytics skills. Accountants are increasingly entrusted with more tasks due to the belief that sophisticated internal controls and internal audits will detect any unethical decisions. Hence, early-career professional accountants are tasked with a greater number of decisions.

The influence of deliberation time and decision making has been examined in multiple outlets. In the book *Blink*: *The Power of Thinking Without Thinking,* author Malcolm Gladwell (2005) discusses the phenomenon of quick decisions and the resulting conclusions. He posits that the human brain has capabilities of arriving at a conclusion through an internal computer, or adaptive unconsciousness. This capability is further heightened with repeated exposure to data. However, the quality of the conclusion is contingent on the quality of the data. Therefore, he suggests that humans should be wary of their own instincts. However, Gladwell states that instinctive responses may be influenced through education and therefore controlled (Gladwell, 2005).

Prior scholarly research in psychology and business literature has examined the concept of deliberation time in relation to ethical decision making. Yet, recent studies report conflicting results. Overall, the relationship between deliberation time and decision quality has followed an inverted u-shape pattern (Moberg, 2000; Amabile, 1988; Scott and Bruce, 1994; Andrews & Farns, 1972). Research by Lai, Sasmita, Gul, Foo, & Hutchinson (2018) finds that "auditor busyness" arises when auditors accept more clients than they can serve effectively. As a result of decisions made quickly, the audit suffers from inferior due diligence and infringed ethical guidelines. Conversely, a study by Shalvi, Eldar, and Bereby-Meyer (2012) reveals that ethical decision quality declines with the passage of time, as time allows for rationalization.

The expectations and demands for integrity and ethicality are evident in both the early-career professional accounting environment and the academic context of a professional Master of Accounting degree program. Both professional accounting and graduate university environments posit heavy workloads along with requirements for ethical behavior. Gaining knowledge through the examination of time taken for deliberation in relation to decision quality will enlighten leadership with new opportunities to improve both institutions.

This study seeks to measure the quality of ethical decisions made by early-career professional accountants when presented with various ethical dilemmas. The measure that captures the level of ethics is referred to as Ethical Decision Quality (EDQ). A higher total EDQ score is noted when an accountant employs accounting-specific ethical principles in their responses to a scenario portraying an ethical dilemma. The result of a high total EDQ is an ethically favorable outcome for the stakeholders. Conversely, a lower EDQ score occurs when the accountant ignores or rejects ethical

principles resulting in an ethically unfavorable outcome for the stakeholders.

Therefore, this study seeks to answer the question: Is there an association between work location, deliberation time and ethical decision making in early-career professional accountants?

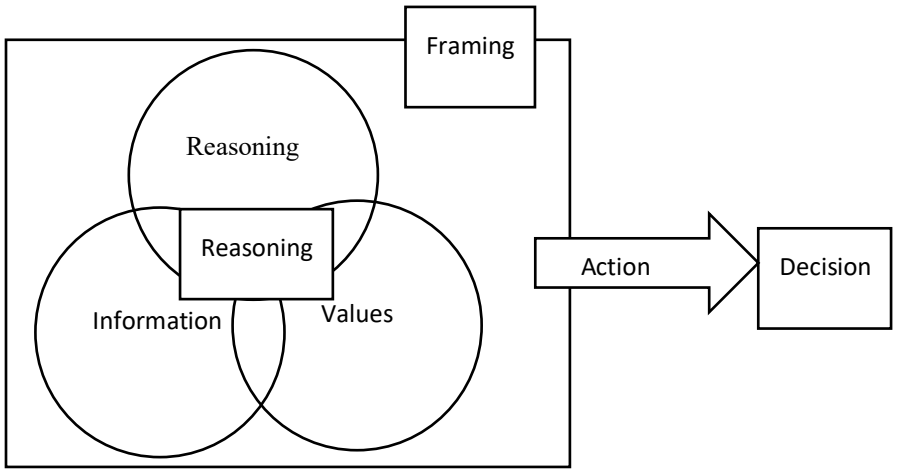
I use secondary data collected by a longitudinal field experiment to examine the relationship between work location, deliberation time and ethicality when early-career professional accounting students are presented with various ethical dilemmas. Ethical dilemmas are assessed using a questionnaire. I find evidence that both work location and deliberation time are associated with ethical decision quality.

BACKGROUND

Defining Ethical Decision Quality

Scholars define *decision quality* as the judgement of quality at the moment the decision is made. Decision quality is not measured by the action that follows as the result of the decision (Howard 1988, Raiffa, Hammond, & Keeney, 2002). Decision quality is composed of six elements: *framing, alternatives, relevant and reliable information, clear values and tradeoffs, sound reasoning,* and *commitment to action* as shown in Figure 1. *Framing* provides specifics about the issues to be decided. Within the frame, *alternatives* defines the choices available; *information* details knowledge and assumptions associated with the alternatives; and *values* reflect the morals, desires and goals for achievement. *Reasoning* combines *information, alternatives,* and *values,* forming the decision basis. *Action* is the election of the choice leading to the decision (Matheson & Matheson, 1998). In this study, I focus on the *values* element of decision quality through the lens of ethicality, thus I arrive at my dependent variable, *Ethical Decision Quality* (EDQ).

Figure 1: Elements of the Decision Quality Process



The word *ethics* used in isolation is often inappropriately assumed to inherently possess a directional characteristic that is either "right" or "wrong". However, the term originates from the Greek word *ethos*, simply meaning "custom, habit, character or disposition" (Merriam-Webster, 2024). The term used in isolation does not self-postulate behavior as right or wrong, rather it requires a referent system as a basis for judgement. Simply stated, ethics is a set of moral principles (Corts, 1968). *Morals* are "principles of right and wrong behavior and the goodness or badness of human character" (encyclopedia.com, 2021). It is within the referent system which is comprised of moral principles defining right and wrong that an ethical decision may be judged right (high quality) or wrong (low quality). Therefore, the term ethics is neutral until a specified set of moral principles is applied to the context of the decision. In this study, the referent system of moral principles guiding the accounting profession is the AICPA CPC.

The AICPA CPC was first introduced in 1973, revised in 1988, and updated in 2014. It is composed as a principles-based standard, versus a rules-based standard, and is applicable to all members of the AICPA. The principles inform general norms providing a framework for more specific rules. Though there are various codes of conduct within professional accounting, the AICPA code is the most widely adopted code by the states for the organization of certified public accountants (CPAs).

The next section presents a review of the literature, theoretical framing and hypothesis development. This is followed by an explanation of the experimental design, description of the research instrument, and method of facilitation. Results of the statistical analyses are presented. A discussion follows explaining the findings and implications for ethical decision making. I conclude with limitations and recommendations for future research.

LITERATURE REVIEW

This section presents a study in the context of prior accounting research on ethical decision making. I focus specifically on literature regarding the expectations for ethicality and the role of the AICPA CPC in professional accounting. I follow this with a presentation of literature on work location and deliberation time. I conclude with a brief presentation of findings from prior research regarding the influence of professional work experience and gender on ethical decision making.

Ethical Decision Making

The study of ethical decision making is covered extensively in prior research including psychology and general business streams. Over a period from 1975 to 2015, approximately 500 articles were published on empirical research in ethical decision making (Lehnert, Craft, Singh & Park, 2016). The prevalence of scholarship is also evidenced by the number of meta-analyses on ethical decision making conducted over the last three decades (Lehnert et al., 2016; Ford & Richardson, 1994; Loe, Ferrell & Mansfield, 2000; O'Fallon & Butterfield, 2005; Craft, 2013; Lehnert, Park and Singh, 2014). Most of the studies covered in the meta-analysis are focused on non-business psychology or general business ethics journals.

Ethical Decision Making in Professional Accounting

Research related specifically to ethical decision making in professional accounting emerged in the 1980's (Brampton & Cowton, 2013; Uysal, 2010). A search in Business Source Complete for academic journal articles, published between 1960 and 2025, using the terms "ethics" and "decision" and "accounting", results in only 564 articles. In the mid to late 1980's, the American Accounting Association (AAA), a professional association which publishes academic journals, organized the AAA Ethics Research Symposium to bring more attention to the importance of the topic. In 1989, the AAA launched the *Behavioral Research in Accounting* journal. This journal is where a majority of contemporary literature specific to professional accounting ethics is presented. Other journals contributing to the study of ethical decisions in accounting include the *Journal of Business Ethics* and *Issues in Accounting Education.*

Furthermore, the National State Boards of Accounting Center for Public Trust in Accounting (NASBA CPT) (2021) calls for more scholarship by the linking of theory to practice. Specifically, their mission statement declares, "Business ethics should consist of more than testing on the code of ethics, but should provide new knowledge to enhance business practices." Though I could argue that all professional accounting decisions are ethical decisions, prior empirical research specific to ethical decision making within the field of professional accounting is limited. In Bampton & Cowton's (2013) systematic review of previously published accounting ethics scholarship, they failed to find any research to report within their category, *accounting theory*. Though the research specific to ethical decision making in accounting is limited, several related articles contribute to my review.

Bampton and Cowton (2013) noted that the majority of prior research focused on assessing attitudes and biases toward the situation instead of actual behavior decisions. They also recommended that prior work in the field suffered from a lack of research on the impact of accounting ethics interventions and circumstances among various types of people. Studies have been performed examining the separability of personal ethics and biases from firm-level ethics. "Due to the design of our minds, mental traps and biases frequently get between our best intentions and true decision quality" (Spetzler, Winter & Meyer, 2016). No matter if the final impact of a decision is at the individual level or through collaborative efforts at the firm level, the inception of every decision is within a unique individual. Thus, I examine ethical decision making using the early-career professional accountant as my level of analysis.

Unsurprisingly, the primary theme in prior accounting ethics research involves fraud and corruption. Ferrell & Ferrell (2011) shows that the failure of Enron was due to institutional factors and systematic leadership deficiencies that served to influence decision making. Lail, MacGregor, Marcum and Stuebs (2017) examine the role of virtues and conclude that virtuous professionalism should be addressed first in an effort to repair damage done to financial reporting systems caused by past fraud. Further studies suggest that formal ethical training failed to prevent ethical lapses in decision making (Craft, 2013).

Work Location

Social cognition studies have shown that people behave differently when working in the presence of others versus working alone (Jordan 2009; Sparks 2015; Palazzo, Krings & Hoffrage 2012; Hannah, Avolio & May 2011; Reynolds 2008). Behavioral influences arise such as conformity, co-policing, behavior normalization and intensification of attitudes. A study on business schemas finds that organizational beliefs are modeled by colleagues and mangers in their everyday work behavior thereby influencing the decision-making process of collocated employees (Jordan 2009; Elango, Paul, and Shishir 2010). Zahra (2005) reveals that lack of supervisory and peer monitoring increases the opportunity to act unethically.

However, the result of ethical behavior based on location is contradictory. Auditors that work in close proximity to their clients demonstrate higher ethical behavior in materiality judgement (Manita, Lahbari, and Elommal 2011). Collocated accountants adopt a neutral, or middle-ground position, when faced with an ethical decision (O'Leary and Pangemanan 2007). According to the theory of Moral Disengagement by Bandura (1991), moral principles are indoctrinated when individuals are collocated.

Yet, conflicting studies find that collocated work environments may negatively influence accountants' ethical behavior. A study by Abdolmohammadi and Baker (2006) finds that accountants who prefer conformity and co-policing values have lower levels of moral reasoning. When working remotely, accountants will make extreme ethical decisions, either highly ethical or highly unethical, versus when collocated (O'Leary and Pangemanan 2007).

Deliberation Time

Research from psychology, general business, and accounting reveal prior findings related to deliberation time and ethical decision quality. However, the results are conflicting. Some studies find that a quick decision results in higher ethical decision quality, or that time taken for deliberation returns a lower ethical decision quality. Verschuere, Köbis, Bereby-Meyer, Rand, & Shalvi (2018) finds that telling the truth requires less time than telling a lie, as lying requires greater cognitive resources. Quick decisions are based on simple or familiar rules, instead of lengthy deliberations, and subsequently result in the decision-maker fixating on one alternative while disregarding all others (Simon, 1960; Bruner, Goodnow, & Austin, 1956; Luchin,1942). A seminal study in decision making by Ben-Zur and Breznitz (1981) finds that a shorter deliberation time revealed increased risk aversion by the decision maker resulting in a higher ethical decision quality. A study by Svensson and Wood (2005) finds that deliberation time is crucial in managing the quality of core values in an organization. And decisions should be made quickly to minimize core value compromise. Zhong, Ku, Lount, and Murnighan (2010) find that a longer timeframe for deliberation resulted in lower ethical decision quality. In their study, prolonged introspection diverted respondents away from initial affective reasoning and ethical reactions. Finally, Moberg (2000) concludes that short deliberation times leads to less rationalization. These findings that show decisions made within lower deliberation times are more ethical are also in agreement with the Fraud Triangle Theory, which posits that time for rationalization leads to increased chances of justifying unethical decisions (Cressey, 1973).

Other studies show just the opposite. Quick decisions result in a lower ethical decision quality and time taken for deliberation of decision consequences increases ethical decision quality. Research by Lai, Sasmita, Gul, Foo, and Hutchinson (2018), and Koh, Scully, and Woodliff (2018) show that decreased deliberation time reduces ethical decision quality. In the study by Lai et al. (2018), findings show that the size of an individual auditor's client base is associated with auditor decision quality. Larger client bases resulted in lower auditor decision quality as proxied by the number of audit failures. Koh, et al. (2018) reports that decreased deliberation time has a negative impact on ethical decision quality in a business environment, though the ethical decision quality is somewhat higher if the decreased time is anticipated. Dorner (1990) finds that decisions made quickly are more "ballistic" as they do not consider all the consequences of the decision. In the realm of a positively positioned decision, such as one allowing the opportunity to help another person, a quick decision has been shown to decrease citizenship behavior (Hui, Organ & Crooker, 1994).

Individual Factors

Gender

By far, gender receives the greatest attention in prior research on ethical decision making (Lehnert, et al., 2014). Yet even with this extensive examination, contradictory findings exist. Although most studies find that gender is not related to ethical decision making, those studies with significance note that females are more ethical than males (Lehnert et al., 2014; Craft, 2013; O'Fallon & Butterfield, 2005; Tse & Au, 1997). Research shows that there is a

difference between moral orientation between genders (Baker & Hunt, 2003) and that responses to various ethical dilemmas varied based on gender (Christie, Kwon, Stoeberl & Baumhart, 2003). Other research finds that females demonstrate a higher sensitivity and less tolerance of ethical issues (Lehnert, et al., 2014; Eweje & Brunton, 2010; Ameen, Guffey & McMillan ,1996). Furthermore, females used a harsher judgement than males when analyzing ethical case scenarios (Fleishman & Valentine, 2003). Females also were higher in their ability to enact moral reasoning (Herington & Weaven, 2008; Eynon, Hill, & Stevens, 1997). In a study on perception, Krambia-Karpardis and Zopiatis (2008) finds that females are more ethical than males. Specific to accounting ethics research, Bernardi and Donald (1997) show that females exceed males in moral development and that low-moral-development females along with high-moral-development males are exiting the profession. These findings suggest that the profession has effectively managed to retain low-morally-developed males and high-morally-developed females. Likewise, Sweeney (1995) and Etherington and Schulting (1995) find that gender plays a role in moral reasoning for professional accountants.

Conversely, previous studies examined the relationship between moral intensity and ethical decision making. To this end, Nguyen, Basuray, Smith, Kopka, and McCulloh (2008) reports that gender does not moderate the relationship between ethical decisions and moral intensity. In a study using accounting students, Chan and Leung (2006) find no association between gender and ability to recognize ethical dilemmas using case scenarios.

Professional Experience

Prior research shows minimal differences in ethical reasoning between students and seasoned professionals. A study by Emerson, Conroy and Stanley (2007) shows there is little significance between accounting students and accounting professionals with longer work experience. Scofield, Phillips and Bailey (2004) find no significance based on level of accounting position at the firms. However, in a study on ethical decision making of internal auditors, O'Leary and Stewart (2007) shows that more experienced auditors made better ethical decisions in some cases. Conversely, Ponemon and Gabhart (1993) find that moral awareness is higher at the staff-level and slowly declines as the accountant works up to the partner level.

THEORETICAL FRAMING

Prior research in accounting ethics is characterized by an absence of theoretical framing and explicit hypothesis (Randall & Gibson, 1990; Weber, 1992; Robertson, 1993). Sir Ronald Fisher, a noted British statistician, (cited in Cochran, 1965) calls for the substantiation of correlation-based methods by "making your theories elaborate" (pg. 252). Miles and Shevlin (2010) clarify Fisher's position by stating that the theory itself should determine the independent variables. By this, analyses move from correlational inferences to causal inferences. Abelson (1995) states that there should be no relationships that are not explained by the hypothesized causal mechanism. Therefore, the Fraud Triangle Theory is used for framing the study as shown in Figure 2.

Fraud Triangle Theory

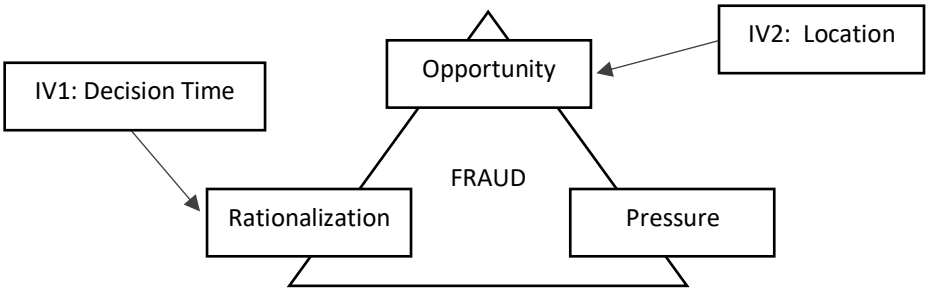
The concept of organizational deviance, a behavior which ultimately leads to fraud, has been studied for decades (Vaughan, 1999). Scholars and practitioners share a common goal of understanding specific individual or situational factors that ultimately lead to detection of unethical behaviors. The field of Fraud Examination emerged by unifying the study of two distinct disciplines: accounting and criminology. Morales, Gendron and Guénin-Paracini (2014) posit that the Fraud Triangle, a framework developed by D.R. Cressey (1973), serves as the basis for this unified discipline. The widespread propagation of the Fraud Triangle yields debate encompassing the evaluation, monitoring, and normalization of character, all at the individual unit of analysis.

Morales, et al. (2014) explains that the coupling of control mechanisms, such as a code of ethics, with an individual's morality is essential to detecting and deterring abnormal or fraudulent behaviors. The need for consideration of individual human character is required to construct effective control policies and interventions (Foucault, 1977-8). This is the intent and attempt of the Fraud Triangle as it goes beyond a static list of rules or policies and incorporates the concepts of morality and immorality. It serves as a measure of "soul" as an indicator for potential fraud (Morales, et al., 2014).

In this study, I extend the Fraud Triangle which states that three factors must exist and culminate for fraud, or compromised ethical decision quality, to occur: Rationalization, Opportunity, and Pressure (Cressey, 1973). According to the theory, *opportunity* is the ability to execute a plan without being caught, *pressure* is a negative force influencing a behavior, and *rationalization* is a justification of personal actions. The theory was developed to provide

an explanatory three-legged framework whereby firms should build mechanisms to deter and prevent fraud. I assess the impact of deliberation time in relation to ethical decision quality through the lens of these three factors.

Figure 2: The Fraud Triangle Theory: Derived Independent Variables



Adapted from Cressey (1973)

One limitation is that the theory was created to explain solo fraud behavior conducted on an individual basis (Morales, 2014). Furthermore, Cressey's construct of pressure was specific to incentivization (1973). For this study, incentive is held constant as it appears in the form of the requirement of completing a task.

Opportunity

Opportunity, a key component of the Fraud Triangle Theory, is heightened in remote work environments due to reduced oversight. Cressey's (1973) framework suggests that fraud is more likely to occur when individuals perceive an opportunity to commit unethical acts with minimal risk of detection. Remote work arrangements, accelerated by the COVID-19 pandemic, have introduced new fraud risks, as students and employees operate outside traditional settings with limited direct oversight (Alshurafat et al., 2021). The absence of immediate managerial oversight and the reliance on digital communication may create loopholes for financial misconduct (Bailey et al., 2021). Furthermore, organizations transitioning to remote settings have faced challenges in maintaining segregation of duties, increasing the risk of collusion and internal fraud (Westhausen & Hunton, 2022).

Rationalization

The lens of rationalization is used to examine the impact of deliberation time on ethical decision quality. Rationalization has been viewed using the theory of Moral Disengagement, which finds that influences of the work environment ethics results in self-imposed sanctioning, providing a regulatory mechanism for ethical behavior (Bandura, 1991). Moral disengagement occurs when the situation allows for a separation from normal self-sanctioning. According to Mayhew and Murphy (2014), individuals disengage by either reframing an unethical act as ethical, minimizing or dismissing the consequences, or shifting responsibility to another individual.

Accordingly, another underlying component of rationalization is that of moral relativity. As the individual engages in repeated rationalization, they tend to gradually reinterpret what they once held as *truth.* This effect of wearing away may be a result of employment in a firm that espouses an unethical culture. No matter the origin of moral relativity, the individual eventually becomes detached from their previous definition of honesty (Sutherland, 1983).

The issue of deliberation time also impacts rationalization to commit fraud. In literature, rationalization is sometimes referred to as *sense-making,* or the process of assigning value to a behavior (Weick, Sutcliffe, & Obstfeld, 2005). Deliberation is defined as, "the act of thinking about or discussing something and deciding carefully" (Merriam-Webster, 2025). As time increases, the opportunity to deliberate decisions and rationalize fraudulent behavior is increased.

Pressure

Within the Fraud Triangle, pressure was proposed to reflect the pressure of incentives to commit fraud (Cressey, 1973). For instance, it is widely known that when a firm rewards managers based on the bottom-line, fraudulent earnings management increases. Though not addressed specifically in this study, incentives are inherent to both decision time and location.

In consideration of prior research and theoretical framing, findings suggest that the influence of work location and deliberation time is inconclusive yet deserving of continued examination. Future analysis would serve to inform professional accounting firms about workplace environments that may improve ethical decision-making and reduce fraud risk. Therefore, in accordance with Cressey (1973), I expect to find that both work location and deliberation time are associated with ethical decision making.

RESEARCH MODEL

Figure 3 shows the model for this research. The independent variables, *Deliberation Time (DT)* and Location *(L),* serve as the main effect variables on the dependent variable that captures the measure of the level of ethicality, *Ethical Decision Quality (EDQ)*. *Professional Experience* and *Gender* serve as control variables.

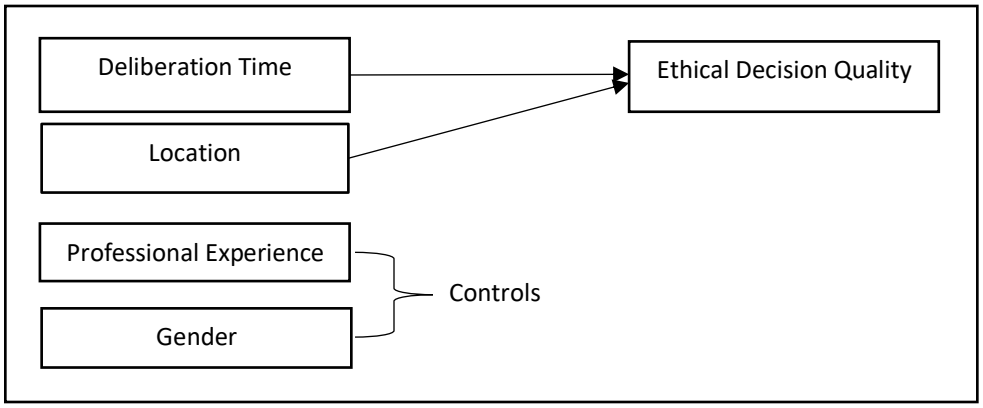


Figure 3: Research Model, Ethical Decision Quality Factors in Professional Accounting

Variables from the research model are defined in Table 1 below. EDQ can range from 0 to 10. A higher total EDQ score is noted when a participant employs accounting-specific ethical principles in their responses to a scenario portraying an ethical dilemma. The result of a higher total EDQ is an ethically favorable outcome for the stakeholders. Conversely, a lower EDQ score occurs when the participant ignores or rejects ethical principles resulting in an ethically unfavorable outcome for the stakeholders.

Table 1: Ethical Decision Quality Factors

Name	Definition	Measure
DV1: Ethical Decision Quality (EDQ)	continuous variable calculated as the subject's total survey score	Total points on a scale from 0 to 10
IV1: Deliberation Time (DT)	continuous variable based on the amount of time elapsing between the subject opening the question and submitting the response	Unit of time in seconds
IV2: Location	categorical variable based on the subject's location when completing the survey	0 = collocated 1 = remote
CV1: Experience	categorical variable based on the subject's professional experience	1 = 0 to 5 years 2 = 6 to 10 years 3 = 11 to 20 years 4 = 20+ years
CV2: Gender	categorical variable based on the gender of the subject	0 = Male 1 = Female

METHODOLOGY

In both psychology and business literature, ethicality has typically been examined through a qualitative approach. This study seeks to add to the body of knowledge by using a quantitative social scientific approach. The social scientific approach utilizes theory and observation of phenomena with operationalized and measurable variables (Trevino, 1992). Field experiments are reputed to be highly generalizable in management research (Braithwaite, 1955; Kaplan, 1964). In this research, I use data collected through a longitudinal field experiment. I present participants with various scenarios of ethical dilemmas situated in the accounting profession. I then collect data with a software system which tracks various information including the participants' responses, work location, and deliberation time.

Participants

Study participants were students in a Master of Science in Accounting class at a North American university. This is appropriate due to the generalized nature of the scenarios that present graduate-level accounting ethical dilemmas (Arnold, Collier, Leech & Sutton, 2004). The participants had various levels of prior accounting and financial experience ranging from accounting firm internships to executive level positions such as industry controllers and Chief Financial Officers. All participants had requisite coursework in accounting. Therefore, the participants were not a convenience sample and did not serve as mere proxies for actual accountants (Bampton & Cowton, 2013; Randall & Gibson, 1990). Participants totaled 172.

Demographic information was collected such as gender and total years of professional work experience. Professional experience ranged from 0 to 20+ years (M = 8.5 years, standard deviation [SD] = 4.7 years. Sixty-one percent of the participants were male and 39% were female. All participants held either an undergraduate degree in accounting or a graduate-level certificate in accounting fundamentals. In addition to responses to the ethical sensitivity questions, data reflecting deliberation time per question were collected.

Experimental Task

The experiment was conducted with two distinct classes of students. The first group of students (n = 72) completed the experiment in a traditional face-2-face (collocated) classroom. The second group of students (n = 100) completed the experiment in an online (remote) class setting. In both locations, students accessed their online course site. Students were provided an electronic PDF of three scenarios focused on an ethical accounting dilemma authored by Knapp (2017) to read and consider. Leitsch (2004) finds evidence for using varying scenarios in this methodology because "various accounting issues had an influence on students' moral intention and moral intensity." Scenarios were written in the third person rather than directly asking what the participants would do themselves. According to Ponemon and Gabhart (1993) and Arnold and Ponemon (1991), the approach of framing scenarios and questions in the third-person is more effective due to the ethical nature of the context.

Using a survey tool in the online course site, participants were given thirty minutes to answer ten randomized ethical sensitivity questions related to the three ethical scenarios (See Appendix A). Clay (2001) states that students require an average of 30 seconds to respond to questions with only two choices. Allowing the participants thirty minutes to answer ten true-false questions reduced the probability that time pressure was a factor. Additionally, the use of true-false questions provides a more discrete determination of decision as compared to multiple choice questions with three or more choices. The research shows that participants may believe that multiple answers are correct, yet they are forced to select only one answer (Parker, Anderson, Heidemann, Merrill, Merritt, Richmond, & Urban-Lurain, 2012). Second, participants' responses were not recorded until the questions were saved by the student in the software prior to moving on to the next question. Participants opened the questions one at a time. Deliberation time was determined by the amount of time (in seconds) from when the participant opened the question to the point they submitted their decision. Surveys were anonymous and no incentive was given for completion.

RESULTS

A test of the relationship among all variables in this study was performed and investigated using zero-order Pearson correlations to test the independent variables for both collocation and remote settings. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. There was a negative correlation between the two variables, DT and EDQ, $r = -.474$, $n = 172$, $p < .001$, with higher decision time associated with lower ethical decision quality scores. Though there was also negative correlation between the two variables, L and EDQ, significance was not found. However, results from the hierarchical analysis suggests that L is a suppressor variable as it does influence the model. When added to the model, L serves to explain additional variance and strengthen correlations, improving the overall model fit.

Details of mean, standard deviations, and correlation coefficients are presented in Table 2.

Table 2: Mean, Standard Deviation and Correlations

Measure	*M*	SD	CV1	CV2	IV1	IV2	DV
CV1: Experience (E)	8.5	4.70	-	.120	-.068	.081	-.104
CV2: Gender (G)	.40	.490	0.120	-	.109	.093	-.072
IV1: Deliberation Time (DT)	325.62	227.856	.081	.093	-.042	-	-.474*
IV2: Location (L)	.42	.495	-.068	.019	-	-.042	-.113
DV: Ethical Decision Quality (EDQ)	6.51	1.722	-.104	-.072	-.113	-.474*	-

* Correlation is significant at the <.01 level (2-tailed)

Hierarchical Analysis

I used hierarchical multiple regression to assess the ability of location and deliberation time to predict the level of ethical decision quality after controlling for the influence of work experience and gender. The results are detailed in Table 3.

In Table 3, hierarchical multiple regression was used to assess the ability of location and deliberation time to predict the level of ethical decision quality after controlling for the influence of work experience and gender. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. Work experience and gender were entered at Step 1, explaining 1.4% of the variance in ethical decision quality. After entry of the location and deliberation time at Step 2, the total variance explained by the model was 24.8% $F(4, 167) = 13.774$ $p < .001$. Location and deliberation time explained an additional 23.4% of the variance in ethical decision quality after controlling for work experience and gender, *R* squared change = 0.234, *F* change (2, 167) = 25.954, $p < .001$. In the final model, location was statistically significant (*beta* = -.137, $p = .045$) and deliberation time was statistically significant (*beta* = -0.474, $p < .001$). According to these findings, collocated students make better ethical decisions versus those in remote locations. Additionally, as deliberation time increases, ethical decision quality decreases.

Table 3: Hierarchical Regression with DV1, IV1, IV2, CV1 and CV2

	Model 1		Model 2	
Variable	*b*	Sig.	*b*	Sig.
CV1: Work Experience	-.096	0.212	-.074	.277
CV2: Gender	-.060	.434	-.004	.953
IV1: Deliberation Time			-.474**	<.001
IV2: Location			-.137*	.045
R^2:	0.014		0.248	
ΔR^2:			0.234	
F-statistic:	1.230	.295	13.774**	<.001
ΔF-statistic			25.954**	<.001

*, $p \leq .05$, ** $p \leq .001$

Table 4: Hypotheses Outcome

Hypotheses	Results
H1: Controlling for gender and experience, work location influences ethical decision quality.	reject $H1_0$, $p \leq .05$
H2: Controlling for gender and experience, decision time influences ethical decision quality.	reject $H2_0$, $p \leq 0.001$

DISCUSSION

This study provides insights about the relationship between the work location and decision time needed for an early-career professional accounting student to make a high quality decision based on an ethical standard. I find evidence that early-career professional accountants who take more time for deliberation often make more unethical decisions. Using students in a Master of Accounting program allows the opportunity to discover new knowledge about the Fraud Triangle Theory and decision sciences through the study of ethical decision making. Further, the findings of this research may serve to inform both business schools and professional accounting firms in work optimization and planning the control environment. The proposed recommendations consider both situational and individual factors giving rise to unethical decision making. The following discussion serves to inform both prior theoretical research and practical applications in both accounting education and the profession.

Informing the Fraud Triangle Theory

As applied to theory, these findings provide evidence supporting Cressey's (1973) theory, the Fraud Triangle, which states that rationalization and opportunity give rise to unethical behavior. Cressey (1973) posits that rationalization takes time and increases the chance of unethical behavior. Cressey's theory states that an increase of pressure through factors such as promotion incentivization and financial gain results in an increased chance of unethical behavior. Further in this study, pressure is inherent to the ethical cases presented to the students; however, there are no data collected that specifically measure ethical decision quality in the context of pressure.

Informing F2F Versus Online Education

The year 2020 brought unprecedented worldwide changes to both education and the workforce. Business school students were suddenly uprooted from their classrooms and forced into a new work environment in remote locations. In response, universities can enhance collaboration and student ethics in online environments by fostering interactive learning communities, implementing robust academic integrity policies, and leveraging technology for engagement. Encouraging group projects, discussion forums, and peer review activities helps build a sense of accountability and reduces academic dishonesty by promoting collective learning (Moralista & Oducado, 2020). Institutions can also integrate ethics-focused modules into curricula, emphasizing the importance of honesty in digital learning spaces. Additionally, the use of AI-driven plagiarism detection tools and transparent honor codes reinforces ethical behavior while maintaining trust between students and faculty (Owens, 2021). By combining these strategies with regular faculty-student interaction and clear guidelines on academic integrity, universities can create a digital learning culture that prioritizes both collaboration and ethical responsibility.

Workload Optimization

In further application to the profession, the findings demonstrate that striking the balance is crucial for workforce planning. As professional accountants are unable to sustain quality decision making in extreme workloads, this study demonstrates that a light workload may also be a concern. Therefore, the need for workforce optimization arises. Accounting firm leaders must continually reassess and monitor the workload of their staff to ensure the employees are functioning in a balanced manner.

Historically, audit caseload is determined by the auditor's area of expertise and estimated audit hours based on the size of the client. In taxation, returns are allocated based on staff experience with the most complicated filings assigned to senior staff. Many firms are using workforce optimization software solutions. Though the software may, in a practical sense, delegate time for ethical decision making by assigning the proper amount of audits and tax returns to the staff, it does not address ethicality wholistically.

Additionally, environmental control systems should be implemented, reviewed, and maintained to assist in fraud detection and prevention. An obvious strategy for control of ethical behavior is that of technological implementations.

Most firms today boast sophisticated software systems that can detect anomalies in account estimates in real time. However, another powerful control does not rely so heavily on technology. Rather, it calls for continual human resource development and training through increased employee engagement and practical instruction.

One such tool for practical instruction is found in the AICPA CPC. The code calls for the use of the conceptual framework approach in situations where the rules may be compromised by members in public practice. First, the member must identify threats which are defined as "Relationships or circumstances that could compromise a member's compliance with the rules." Second, the member must evaluate the significance of the threat and determine if it is at an acceptable level. An acceptable level means that a third party would agree that the situation does not yield the member to a compromise of compliance with rules. Finally, if the member concludes that the threat is not at an acceptable level, then safeguards must be implemented to eliminate the threat or reduce it to an acceptable level.

According to the conceptual framework approach, safeguards involve any action or measure that mitigates or eliminates the threat. They may be implemented at various levels such as through the profession, legislation, regulation, or the firm. Safeguards may also be implemented by the client. However, such safeguards may not be solely relied upon. Examples of safeguard implemented by the profession, legislation, and regulation are education, training programs, professional standards, external reviews, competency requirements for licensure, and resources such as hotlines for reporting ethical violations and counseling in the case of an ethical dilemma. Examples of safeguards implemented by a firm are expectations for acting in the public interest, monitoring quality control, policies on relationships between the firm and clients, and policies for addressing ethical conduct. Finally, examples of safeguards implemented by the client include policies and procedures to address ethical conduct, governance over decision making regarding a firm's services, and policies prohibiting the violation of independence and objectivity.

Moreover, since it has been shown that repeated exposure to ethics training is effective, accounting educators and professional firms should consider ongoing training in ethics through repeated review of the AICPA CPC and case discussions of prior ethical violations. This may be accomplished through the requirements of the firm itself, as well as the requisite courses delivered through license-mandated continuing professional education (CPE) courses.

CONCLUSIONS

This study examined *opportunity* and *rationalization*, two factors of the Fraud Triangle Theory, in a sample of early-career professional accountants. The findings suggest that collocated work settings promote more ethical decisions, while extended deliberation time is associated with less ethical outcomes, potentially by enabling rationalization. These results contribute to the understanding of ethical decision-making and offer practical implications for reducing fraud risk through workplace design and decision making frameworks.

One explanation of this tension between contrary findings in the literature may be attributed to heuristics used in decision making. In summary, a person who frequently exercises a virtuous heuristic will decide to do "the right thing" quickly (Ordoñez, Benson, & Pittarello, 2015). Gigerenzer and Brighton (2009) find that "fast and frugal" heuristics result in increased decision accuracy. In a short deliberation time, people may use a "feeling heuristic" allowing their mood to control the decision instead of an objective consideration of the alternatives (Siemer and Reisenzein, 1998). The use of heuristics in ethical decision making should be examined.

As with all experimental research, limitations must be acknowledged. There are inherent limitations when using graduate students in experimental studies. The major problems with field experiments include the difficulty of gaining access to organizations, the organization's likely resistance to the use of random assignment, and the inability to control the influence of extraneous independent variables (Trevino, 1992). A study by Moberg (2000) finds that high time pressure negatively affects ethical decision making. The pressure of the time limit in the 30-minute survey window could be a factor that should be examined. Though Holian (2006) finds that varying levels of both holistic skills and judgement is related to gender and age, this study and prior studies suggest individual factors such as age and professional experience have a weak to moderate relationship. The minor differences noted due to age or professional experience could be explained by other holistic skills not examined in this study.

Additional individual variables such as religious-orientation and age would be useful. Foucault (1977-8) reminds us that even the German police understood the concept of *Polizeiwissenschaft* which posits that a set of laws governing the care of buildings, squares and paths cannot be enacted without consideration to "religions and manners" (p. 342). Other behavioral implications are found in groups such as conformity, co-policing, behavior normalization and

intensification of attitudes. Therefore, it should be noted that, due to conformity, lower ethical decision quality may result from working in the presence of other people who are unethical. This proposition may be examined through a future study on work location factoring in measures of ethical in-betweenness, as well as other variables of interest.

Further research is needed to include antecedents of ethical decision making. Potential antecedents are sources of time pressure (career or personal), ethical sensitivity (prior indoctrination), and various other situational and demographic factors. Ethical competence is assumed to be constant as ethics training is a standard to CPA licensure. Further research should be conducted to better understand strategies for optimizing accounting staff workload.

This study does not wish to generalize the differences found to professional accountants who have undergone significant ethical training and CPA certification. Rather the findings should be generalized to the population studied, early-career professional accountants of different ages with varying professional experience.

REFERENCES

Abdolmohammadi, M., & Baker, C. (2006). Accountants' Value Preferences and Moral Reasoning. *Journal of Business Ethics*, 69(1), 11–25. https://doi-org.ezproxy.lib.uconn.edu/10.1007/s10551-006-9064-y.

Abelson, R.P. (1995). *Statistics as principled argument.* Hillsdale, NJ: Erlbaum.

Al-Hiyari, A., Al-Mashaqbeh, I., & Al-Hyari, K. (2021). The impact of COVID-19 on digital transformation in accounting firms. Journal of Accounting and Management Information Systems, 20(3), 485–500.

Alshurafat, H., Beattie, C., Jones, G., & Sands, J. (2021). Remote auditing and fraud risk: The implications of COVID-19 on audit practices. *Journal of Accounting & Organizational Change, 17*(4), 567–589.

Amabile, T. M. (1988). "A Model of Creativity and Innovation in Organizations." In B. M. Staw, and L. L. Cummings (Eds.), *Research in Organizational Behavior,* Volume 10. Greenwich, CT: JAI Press.

Ameen, E. C., Guffey, D. M., and McMillan, J. J. (1996), Gender Differences in Determining the Ethical Sensitivity of Future Accounting Professionals, *Journal of Business Ethics*,15(5), 591-597.

American Institute of Certified Public Accountants (AICPA). (2014). Code of Professional Conduct.

Andrews, F. M. and G. F. Farns. (1972). Time Pressure and Performance of Scientists and Engineers: A Five Year Panel Study. *Organizational Behavior and Human Performance*, Vol. 8, pp. 185-200.

Arnold, V., Collier, P.A., Leech, S. A.and Sutton, S. G. (2004). Impact of intelligent decision aids on expert and novice decision-makers' judgments. *Accounting and Finance,* 44 (1): 1–26.

Arnold, D. F. Sr. and Ponemon, L. A. (1991). Internal auditors perceptions of whistle-blowing and the influence of moral reasoning an experiment. *Auditing, A Journal of Practice and Theory.* 10(2), 1-5.

Baker, T. L. & Hunt. T.D., (2003). An Exploratory Investigation into the Effects of Team Composition on Moral Orientation, *Journal of Managerial Issues,* 15(1), 106-119.

Bailey, C., Collins, D., & Abbott, L. (2021). The impact of remote work on fraud risks and internal controls: Challenges and recommendations. *Accounting Horizons, 35*(3), 299–315.

Bampton, R. & Cowton, C. (2013). Taking Stock of Accounting Ethics Scholarship: A Review of the Journal Literature. *Journal of Business Ethics*, *114*(3), 549–563. https://doi.org/10.1007/s10551-012-1341-3

Bandura, A. (1991). Social cognitive theory of moral thought and action, in and *Handbook of moral behavior and development: Vol. 1 Theory*, eds. W. M. Kurtines and J. L. Gewirtz. Hillsdale, NJ: Erlbaum.

Ben-Zur, H., & Breznitz, S. J. (1981). The effect of time pressure on risky choice behavior. *Acta Psychologica*, 47(2), 89–104.

Bernardi R. & Donald, D. (1997). An examination of moral development within public accounting by gender, staff level, and firm, *Contemporary Accounting Research,* 14(4), 653-668.

Braithwaite, R. (1955). Scientific Explanation. Cambridge: Cambridge University Press. Brass, D.J. & Oldham, G.R. (1976). Validating an in-basket test using an alternative set of leadership scoring dimensions. Journal of Applied Psychology, 61, 652-657.

Bruner, I S., Goodnow, J.J., and Austin, G. A. (1956). A Study of Thinking. New York: Wiley.

Bryce, C., Webb, R., & Adams, M. (2021). The impact of remote working on fraud detection and professional skepticism in accounting. *Accounting Research Journal, 34*(2), 189–205.

Chan, S. Y. S., & Leung, P. (2006). The effects of accounting students' ethical reasoning and personal factors on their ethical sensitivity. *Managerial Auditing Journal, 21*(4), 436–457. doi:10.1108/02686900610661432.

Christie, P. M. J., Kwon, I. G., Stoeberl, P. A. & Baumhart, R. (2003). A Cross-Cultural Comparison of Ethical Attitudes of Business Managers: India, Korea and the United States, *Journal of Business Ethics,* 46(3), 263-287.

Clay, B. (2001). Is This a Trick Question? Kansas Curriculum Center, Kansas State Department of Education. https://www.k-state.edu/ksde/alp/resources/Handout-Module6.pdf

Cochran, W.G. (1965). The planning of observational studies of human populations. *Journal of the Royal Statistical Society, 128,* 234-255.

Corts, Thomas E. (1968) The derivation of ethos, Speech Monographs, 35:2, 201-202, doi: 10.1080/03637756809375583.

Craft, J. L. (2013). A review of the empirical ethical decision-making literature: 2004–2011. *Journal of Business Ethics*, 117(2), 221–259.

Cressey, D.R., (1973). Other People's Money, *Montclair*, Patterson Smith, 30.

deliberation. (2025). In *Merriam-Webster.com*. Retrieved January 29, from https://www.merriam-webster.com/dictionary/deliberation.

Deloitte. (2024). Gen Z and Millenial Report. Retrieved February 1, from https://www.deloitte.com/content/dam/assets-shared/docs/campaigns/2024/deloitte-2024-genz-millennial-survey.pdf?dlva=1

Dorner, D. (1990). The Logic of Failure. In D. E. Broadbent, J. Reason, and A. Baddeley (Eds.), Human Factors in Hazardous Situations. Oxford: Clarendon Press.

Elango, B., Paul, K., Sumit, K. K., & Shishir, K. P. (2010). Organizational ethics, individual ethics, and ethical intentions in international decision-making. Journal of Business Ethics, 97(4), 543–561.

Emerson, T. L. N., Conroy, S. J., & Stanley, C.W. (2007). Ethical attitudes of accountants: Recent evidence from a practitioners' survey. *Journal*

of Business Ethics, 71: 73–87.
Etherington, L. D., and Shulting, L. (1995). Ethical development of accountants. *Research on Accounting Ethics.* 1: 235-51.
ethos. (2024). In *Merriam-Webster.com.*Retrieved December 23, 2024, from https://merriam-wesbster.com/dictionary/ethos
Eynon, G., Hill, N.Y., & Stevens, K. T., (1997). Factors that Influence the Moral Reasoning of Accountants: Implications for Universities and the Profession, *Journal of Business Ethics,* 16(12/13), 1297-1309.
Eweje, G., & Brunton, M. (2010). Ethical perceptions of business students in a New Zealand university: Do gender, age and work experience matter? *Business Ethics: A European Review, 19*(1), 95–111. doi:10.1111/j.1467-8608.2009.01581.x.
Ferrell, O.C. and Ferrell, L. (2011). The responsibility and accountability of CEOs: the last interview with Ken Lay. *Journal of Business Ethics,* 100:2,209-219.
Fleischman, G. & Valentine, S. (2003). Professionals' Tax Liability and Ethical Evaluations in an Equitable Relief Innocent Spouse Case, *Journal of Business Ethics,* 42(1), 27-44.
Ford, R. C., & Richardson, W. D. (1994). Ethical decision making: A review of the empirical literature. *Journal of Business Ethics*, *13*(3), 205–221. https://doi.org/10.1007/bf02074820.
Foucault, M. (1977-78). Security, territory, population. Course at the Collège de France, Paris: Gallimard / Seuil ("Hautes Études" Collection), 2004, 435 p.
Gigerenzer, G., & Brighton, H. (2009). Homo heuristicus: Why biased minds make better inferences. *Topics in Cognitive Science*, 1(1), 107–143.
Gladwell, M. (2005). *Blink: The power of thinking without thinking*. Little, Brown and Co.
Hannah, S. T., Avolio, B. J., & May, D. R. (2011). Moral maturation and moral conation: A capacity approach to explaining moral thought and action. Academy of Management Review, 36(4), 663–685.
Herington, C., & Weaven, S. (2008). Improving consistency for DIT results using cluster analysis. *Journal of Business Ethics, 80*, 499–514. doi:10.1007/s10551-007-9451-z.
Holian, R. (2006). Management decision making, ethical issues and emotional intelligence. *Management Decision*, 44(8), 1122–1138
Howard, Ronald A. (1988). Decision Analysis: Practice and Promise. *Management Science*, *34*(6), 679–695. https://doi.org/10.1287/mnsc.34.6.679
Hui, C., Organ, D. W., & Crooker, K. (1994). Time Pressure, Type A Syndrome, and Organizational Citizenship Behavior: A Laboratory Experiment. *Psychological Reports*, Vol. 75, pp. 199-208.
Iqbal, M., Veltri, N. F., & Shah, S. (2021). Academic integrity in online education: Challenges and strategies during COVID-19. *Journal of Educational Technology & Society, 24*(3), 78–92.
Jordan, J. (2009). A social cognition framework for examining moral awareness in managers and academics. Journal of Business Ethics, 84(2), 237–258.
Kaplan, A. (1964). The conduct of inquiry. San Francisco: Chandler. Kelman, H.C. & Hamilton, V.L. Crimes of obedience.. New Haven: Yale University Press.
Knapp, M. C. (2017). *Contemporary auditing: Real issues and cases*. Mason, Ohio: Thomson/South-Western.
Knight, M. & Taylor, R., 2020. Flexible work strategies for public accounting. *Journal of Accountancy,* 229(2), pp.23–27.
Koh, H. P., Scully, G., & Woodliff, D. R. (2018). Can Anticipating Time Pressure Reduce the Likelihood of Unethical Behaviour Occurring? *Journal of Business Ethics*, 153(1), 197–213.
Krambia-Kapardis, M., & Zopiatis, A. A. (2008). Unchartered territory: Investigating individual business ethics in Cyprus. *Business Ethics: A European Review, 17*(2), 138–148. doi:10.1111/j.1467-8608.2008.00527.x.
Lai, K. M. Y., Sasmita, A., Gul, F. A., Foo, Y. B., & Hutchinson, M. (2018). Busy Auditors, Ethical Behavior, and Discretionary Accruals Quality in Malaysia. *Journal of Business Ethics*, *150*(4), 1187–1198.
Lail, B., MacGregor, J., Marcum, J., Stuebs. M. (2017). Virtuous Professionalism in Accountants to Avoid Fraud and to Restore Financial Reporting. J Bus Ethics 140, 687–704. https://doi-org.ezproxy.lib.uconn.edu/10.1007/s10551-015-2875-y.
Lehnert, K., Craft, J., Singh, N. and Park, Y.-H. (2016), The human experience of ethics: a review of a decade of qualitative ethical decision-making research. *Business Ethics: A European Review*, 25: 498-537. doi:10.1111/beer.12129
Lehnert, K., Park, Y.-H., & Singh, N. (2014). Research Note and Review of the Empirical Ethical Decision-Making Literature: Boundary Conditions and Extensions. *Journal of Business Ethics*, *129*(1), 195–219. https://doi.org/10.1007/s10551-014-2147-2
Leitsch, D. L. (2004). Differences in the perceptions of moral intensity in the moral decision process: An empirical examination of accounting students. *Journal of Business Ethics*, 53, 313–323. doi:10.1023/B:BUSI.0000039378.74446.df.
Loe, T. W., Ferrell, L., & Mansfield, P. (2000). A review of empirical studies assessing ethical decision making in business. *Journal of Business Ethics*, 25(3), 185–204.
Luchin, A. S. (1942). Mechanizations in Problem Solving: The Effect of Einstellung. *Psychological Monographs*, Vol. 54, Whole No. 248.
Manita, R., Lahbari, H. and Elommal, N. (2011). 'The impact of qualitative factors on ethical judgments of materiality: an experimental study with auditors'. International Journal of Business, 16:3, 231–243.
Mayhew, B.W. and Murphy, P.R. (2014). The Impact of Authority on Reporting Behavior, Rationalization and Affect. *Contemporary Accounting Research,* 31: 420-443. https://doi-org.ezproxy.lib.uconn.edu/10.1111/1911-3846.12037
Matheson, D., & Matheson, J. (1998). The Smart Organization: Creating Value through Strategic R&D. *Harvard Business School Press,* Boston, MA. 298 pp.
McCabe, S., Cohn, M., Browning, L., Russell, R., & Stimpson, J. (2017, September 18). 2017 top 100 PEOPLE Extra: Accounting's biggest issues. Retrieved February 20, 2021 from https://www.accountingtoday.com/news/2017-top-100-people-extra-accountings-biggest-issues.
Miles, J., & Shevlin, M. (2010). *Applying regression & correlation: A guide for students and researchers*, London: Sage Publications.
Moberg, D.J. (2000). Time Pressure and Ethical Decision-Making: The Case for Moral Readiness. *Business and Professional Ethics Journal,* 19(2), 41-67. https://doi.org/10.5840/bpej200019214
"morals" *The Oxford Pocket Dictionary of Current English*. (2021). Retrieved January 12, 2021 from Encyclopedia.com: https://www.encyclopedia.com/humanities/dictionaries-thesauruses-pictures-and-press-releases/moral-1
Morales, J., Gendron, Y., & Guénin-Paracini, H. (2014). The construction of the risky individual and vigilant organization: A genealogy of the fraud triangle. *Accounting, Organizations and Society*, *39*(3), 170–194. https://doi.org/10.1016/j.aos.2014.01.006
Moralista, R., & Oducado, R. M. (2020). Faculty perception toward online education in higher education during the COVID-19 pandemic. International Journal of Educational Management, 34(7), 1153–1166.National State Boards of Accountancy, Center for Public Trust. (2021). *About Us.* Retrieved on February 11, 2021, from https://thecpt.org/about-us/.
Ness, Alisha, M., & Connelly, S. (2017) Situational influences on ethical sensemaking: Performance pressure, interpersonal conflict, and the recipient of consequences, *Human Performance*, 30:2-3, 57-78, DOI: 10.1080/08959285.2017.1301454
Nguyen, N. T., Basuray, M. T., Smith, W. P., Kopka, D., & McCulloh, D. (2008). Moral issues and gender differences in ethical judgment using Reidenbach and Robin's (1990) multidimensional ethics scale: Implications in teaching of business ethics. *Journal of Business Ethics*,

77(4), 417–430.
O'Fallon, M., & Butterfield, K. (2005). A Review of the Empirical Ethical Decision-Making Literature: 1996-2003. *Journal of Business Ethics, 59*(4), 375-413. Retrieved November 4, 2020, from http://www.jstor.org/stable/25123570
O'Leary, C. & Stewart, J. (2007). Governance factors affecting internal auditors' ethical decision-making. *Managerial Auditing Journal*, *22*(8), 787–808. https://doi.org/10.1108/02686900710819643
O'Leary, C., & Pangemanan, G. (2007). The effect of groupwork on ethical decision-making of accountancy students. *Journal of Business Ethics*, 75(3), 215–228
Ordóñez, L., Benson, L. & Pittarello, A. (2015). Time Pressure Perception and Decision Making. In The Wiley Blackwell Handbook of Judgment and Decision Making (eds G. Keren and G. Wu) doi:10.1002/9781118468333.ch18.
Owens, C. (2021). Academic integrity and online learning: Best practices for promoting ethical behavior. *Journal of Higher Education Policy and Management, 43*(5), 623–638.
Palazzo, G., Krings, F., & Hoffrage, U. (2012). Ethical blindness. Journal of Business Ethics, 109(3), 323–338.
Parker, J. M., Anderson, C. W., Heidemann, M., Merrill, J., Merritt, B., Richmond, G., & Urban-Lurain, M. (2012). Exploring undergraduates' understanding of photosynthesis using diagnostic question clusters. *CBE-Life Sciences Education,* 11(1), 47–57. https://doi.org/10.1187/cbe.11-07-0054.
Ponemon L. & Gabhart, D. (1993). Ethical reasoning in accounting and auditing. *Canadian General Accountants' Research Foundation,* Vancouver.
Raiffa, H., Hammond, J. S., & Keeney, R. L. (2002). Smart Choices: A Practical Guide to Making Better Decisions. In *Harvard Business School Press Books* (p. 1).
Randall, D. M., & Gibson, A. M. (1990). Methodology in business ethics research: A review and critical assessment. *Journal of Business Ethics*, 9(6), 457–471.
Reynolds, S. J. (2008). Moral attentiveness: Who pays attention to moral aspects of life? Journal of Applied Psychology, 93(5), 1027–1041.
Robertson, D. C. (1993). Empiricism in business ethics: Suggested research directions. J*ournal of Business Ethics*, 12(8), 585–599.
Schroeder, R. G., Clark, M., & Cathey, J. M. (2017). *Financial accounting theory and analysis: Text and cases*.
Scofield, S. B., Phillips Jr., T. J., & Bailey, C. D. (2004). An empirical reanalysis of the selection-socialization hypothesis: A research note. *Accounting, Organizations and Society,* 29 (5–6): 543–63.
Scott, S. G., & Bruce, R.A.(1994). Determinants of Innovative Behavior: A Path Model of Individual Innovation in the Workplace. *Academy of Management Journal*, Vol. 37, pp. 580-607.
Shalvi, S., Eldar, O. & Bereby-Meyer, Y. (2012). "Honesty Requires Time (and Lack of Justifications)." *Psychological Science,* 23.10: 1264-270. Web.
Siemer, M. and Reisenzein. R. (1998). Effects of Mood on Evaluative Judgments: Influence of Reduced Processing Capacity and Mood Salience. *Cognition and Emotion*, Vol. 12, pp. 783-805.
Simon, H. A. (1960). The New Science of Managerial Decision. New York: Harper.
Sparks, J. R. (2015). A social cognitive explanation of situational and individual effects on moral sensitivity. Journal of Applied Social Psychology, 45, 45–54.
Spetzler, C. S., Winter, H. and Meyer, J. (2016). *Decision quality : value creation from better business decisions*. WILEY.
Sutherland, E.H., (1983). White collar crime: The uncut version. Yale University Press, New Haven and London.
Svensson, G. and Wood, G. (2005). 'Business ethics in TQM: the qualities and spectrum zones of a case illustration'. *The TQM Magazine*, 17:1, 19–34.
Sweeney, J. (1995). The moral expertise of auditors: An exploratory analysis. *Research on Accounting Ethics.* 1: 213 – 34.
Tiron-Tudor, A., Deliu, D., Farcane, N., & Dontu, A. (2021). Managing change with digital transformation in the accounting profession: A perspective of COVID-19. *Journal of Accounting and Organizational Change, 17*(1), 31–45.
Trevino, L.K. (1992). Experimental Approaches to Studying Ethical-Unethical Behavior in Organizations. *Business Ethics Quarterly*, *2*(2), 121–136.
Tse, A. C. B. and Au, A. K. M. (1997). Are New Zealand Business Students more Unethical Than non-Business Students?, *Journal of Business Ethics,* 16(4), 445-450.
Uysal, O. O., (2010). Business ethics research with an accounting focus: A bibliometric analysis from 1988 to 2007. *Journal of Business Ethics,* 93(1), 137–160.
Vaughan, D. (1999). The dark side of organizations: Mistake, misconduct, and disaster *Annual Review of Sociology*, 25 (1999), pp. 271-305
Verschuere, B., Köbis, N.C., Bereby-Meyer, Y., Rand, D., & Shalvi, S. (2018). Taxing the Brain to Uncover Lying? Meta-analyzing the Effect of Imposing Cognitive Load on the Reaction-Time Costs of Lying, *Journal of Applied Research in Memory and Cognition*, 7(3), 462-469. https://doi.org/10.1016/j.jarmac.2018.04.005.
Weber, J. (1992). Scenarios in business ethics research. *Business Ethics Quarterly*, 2(2), 137–160.
Weick, K., Sutcliffe, K. M., & Obstfeld, D. (2005). Organizing and the process of sensemaking. Organization Science, 16(4): 409–421.
Westhausen, A., & Hunton, J. (2022). Fraud opportunity in remote work environments: Implications for internal controls and corporate governance. *Journal of Business Ethics, 176*(2), 421–438.
Zahra, S. A., Priem, R. L., & Rasheed, A. A. 2005. The antecedents and consequences of top management fraud. Journal of Management, 31: 803-828.
Zhong, C.-B., Ku, G., Lount, R., & Murnighan, J. (2010). Compensatory Ethics. *Journal of Business Ethics*, 92(3), 323–339. https://doi-org.ezproxy.lib.uconn.edu/10.1007/s10551-009-0161-6

Ricki Livingston, DBA., is an assistant professor in-residence in the accounting department at the University of Connecticut, United States of America. Her research interest includes behavioral accounting ethics, financial reporting analysis, and accounting information systems.

APPENDIX

Appendix A: Survey Instrument, Accounting Ethics Questionnaire

Instructions: Read the three scenarios provided, *Wiley Jakson Accounting Major, Leigh Ann Walker Staff Accountant* and *Bill DeBurger In-Charge Accountant,* written by Knapp (2017). Open the questionnaire and answer the 10 true-false questions as they appear. You have 30 minutes to complete this task. Once you open the questionnaire, the timer will begin and cannot be stopped. Once your answers are submitted, they may not be changed.

Q1. An employer has the right to ask the employee if they have been convicted of a crime before they started working for them.
Q2. Wiley Jackson should immediately contact the office human resource professional at the firm and tell him what happened.
Q3. Assuming that Sally Jones told her office managing partner about Wiley Jackson's incident, she acted ethically in disclosing the incident to him.
Q4. Leigh Ann Walker acted unethically when she told her senior, Jackie Vaughn, that she had not taken the CPA exam.
Q5. Jackie Vaughn overreacted to Leigh Ann Walker's admission that she had been untruthful regarding the CPA exam.
Q6. The partner, Don Roberts, acted appropriately in dismissing Leigh Ann Walker from the firm.
Q7. Bill was probably too inexperienced (18 months with this employer) to oversee such a material, high risk area of the audit.
Q8. Bill did not need to push back after the partner told him, "Don't worry about it", when Bill had asked the partner about the client closing two of the 14 sales departments.
Q9: Bill should sign off on the inventory memo stating that the inventory account was "presented fairly, in all material respects, in conformity with generally accepted accounting principles".
Q10: If YOU were in Bill's situation, after completing almost 1,000 hours of audit work and having only discovered an immaterial number of errors ($72,000), you would sign off that the inventory account was "presented fairly, in all material respects, in conformity with generally accepted accounting principles".

Rethinking Market Power: A Pedagogical Framework for Teaching Monopsony in Labor Markets

Mark A. Nadler, Ph.D. Ashland University, Ohio, USA
Jeffrey E. Russell, Ph.D. Ashland University, Ohio, USA

ABSTRACT

Monopsony has historically received limited attention in economics due to its portrayal as a rare, extreme case of single-buyer control in input markets. As Milton Friedman described, it was seen as "little more than a theoretical curiosum." However, renewed interest in minimum wage policy, union power, and income inequality has brought monopsony back into focus. Modern theory now treats employer market power as a continuum, with growing evidence of its relevance. Despite this, monopsony remains underrepresented in Principles of Economics textbooks. This paper addresses that gap by offering instructors a framework and real-world examples to teach monopsony and monopoly power in both input and output markets, enhancing student understanding of market power and structure.

Keywords: Monopsony, Market Structures, Pareto Inefficiency, Minimum Wage

INTRODUCTION

Historically, the monopsony case received limited attention within the economics discipline. This neglect was primarily due to the classical portrayal of monopsony as an extreme market structure in which a single firm exercises complete control over purchasing an input, typically labor. Given the legal and institutional constraints imposed by pro-competition (antitrust) frameworks, such scenarios were viewed as rare and unsustainable. This perspective is captured succinctly by Milton Friedman, who described monopsony as "little more than a theoretical curiosum" with minimal relevance for practical policy or empirical analysis (Friedman, 2007, p. 139).

In recent years, however, renewed interest in topics such as minimum wage legislation, union bargaining power, and rising income inequality has prompted a resurgence of scholarly focus on employer wage-setting power. This has led to the development of modern monopsony theory, which conceptualizes monopsony not as a binary condition but as a continuum of employer market power in the labor market. The empirical literature on monopsony has expanded rapidly, with references in the EconLit database increasing from just two articles in the 1980s to 64 in the 2010s (Ashenfelter et al., 2021).

This paper is motivated by the growing recognition of monopsony power in labor markets and its limited coverage in Principles of Economics textbooks. We aim to support instructional efforts by offering a framework that explicitly considers market power in both input and output markets. We supplement this framework with real-world examples to facilitate classroom engagement and deepen students' understanding of how monopsony power manifests in contemporary economic contexts.

FOUR MARKET STRUCTURES

We examine the profit-maximizing behavior of a representative firm operating under four canonical market structures to analyze the implications of monopsony power. Each structure is defined by the degree of market power in the output and input markets, assuming a generic product and labor input:

1. Perfect competition in both output and input markets (PC/PC)
2. Perfect competition in the output market and monopsony power in the input market (PC/MSP)
3. Monopoly power in the output market and perfect competition in the input market (MP/PC)
4. Monopoly power in the output market and monopsony power in the input market (MP/MSP)

We adopt the classical representation of monopsony as presented in Joan Robinson's foundational work (Robinson, 1969), which remains prevalent in introductory economics textbooks. We direct attention to Alan Manning's *Monopsony in Motion* (Manning, 2005) for readers seeking a more nuanced, modern treatment of monopsony theory.

Although our model adopts the textbook formulation, our core results remain consistent with those found in Manning's dynamic framework, even if the theoretical justifications diverge.

We approach monopoly and monopsony not as exhaustive descriptions of real-world market power but as pedagogically accessible examples that lend themselves well to graphical analysis—particularly for undergraduate students who are not economics majors. While extensions to more realistic market structures such as oligopoly, monopolistic competition, or oligopsony are conceptually feasible, they lie beyond the scope of this paper.

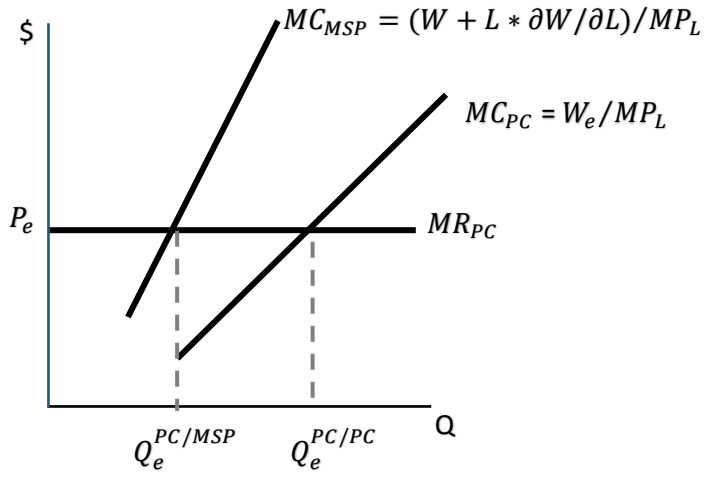
Our analysis explores the effects of each market structure on equilibrium prices and traded quantities. Where appropriate, we examine the impact of policy interventions such as price ceilings**,** minimum wage legislation, and collective bargaining agreements. A notable omission in most Principles of Economics textbooks is the lack of real-world examples corresponding to these canonical cases. To address this gap, we provide illustrative examples that instructors can use to enrich lectures or develop student assignments.

We assume readers know about standard microeconomic notation and are familiar with profit-maximization conditions under perfect competition, monopoly, and monopsony. For clarity, Appendix 1 defines all notation and lists first-order profit maximization conditions for each market structure.

Market Structures PC/PC and PC/MSP in the Output Market

Both PC/PC and PC/MSP appear in Principles Textbooks in economics. PC/PC is the most commonly analyzed market structure in principles of microeconomics. The PC/MSP case is usually analyzed when MSP is discussed. Figure 1 shows a representative firm in the output market.

Figure 1: PC/PC and PC/MSP in Output Market



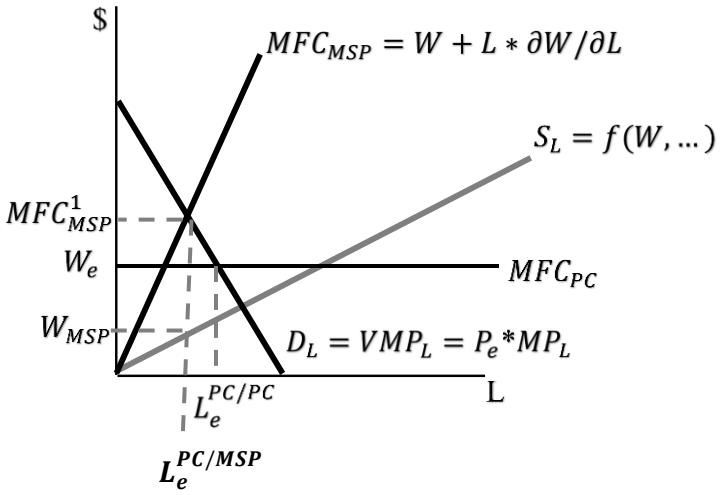
Assuming a standard production function with a fixed capital stock, the marginal cost of a firm buying labor in a competitive market equals the market's equilibrium wage (W_e) divided by its marginal product of labor (MP_L). This yields MC_{PC}. The firm operates under PC in the output market, so its product demand curve is MR_{PC}. Profit maximization occurs at $Q_e^{PC/PC}$ where $MR_{PC} = MC_{PC}$.

The identical firm but with monopsony power in the labor market faces a marginal cost curve MC_{MSP} that for any P_e produces less output, or for any Q_e requires a higher price. The explanation for this is in the numerator of MC_{MSP}. When a monopsonist hires more labor, it must pay a higher wage to the additional unit of labor hired and to all existing labor units. This is captured in the term $(W + L * \frac{\partial W}{\partial L})$ (see Appendix 1 for derivation). For any W_e , $(W_e + L * \frac{\partial W}{\partial L})$ is greater since for an upward-sloping labor supply curve, $\frac{\partial W}{\partial L} > 0$.

In Figure 1, a firm that is PC/MSP maximizes profit by equating $MR_{PC} = MC_{MSP}$. Thus, the presence of MSP lowers its equilibrium volume to $Q_e^{PC/MSP}$. PC in the output market and MSP in the labor input market is Pareto inefficient.

Market Structures PC/PC and PC/MSP in the Input Market
To develop a deeper understanding of MSP, we need to model it in its native input market.

Figure 2: PC/PC and PC/MSP in the Input Market



PC firms in both output and input markets equate D_L with MFC_{PC} (i.e., marginal factor cost), hire $L_e^{PC/PC}$ units, and pay each unit the market wage of W_e. Firms that are PC/MSP face both an upward-sloping labor supply curve (i.e., S_L) and an MFC curve (MFC_{MSP}). Profit maximization occurs where D_L crosses MFC_{MSP}, hires $L_e^{PC/MSP}$ and pays each labor unit W_{MSP}.

Integrating the results from both the output and input sides of the economy, firms that are PC/MSP hire less labor, pay a lower wage, and produce a smaller output volume. These results are Pareto inefficient.

One crucial policy result from the PC/MSP combination is that a minimum wage and a union-negotiated wage (examples of price floors) less than MFC_{MSP}^1 and greater than W_{MSP} creates jobs, expands output, and improves efficiency.

Real-World Examples of PC/PC Market Structure:
The case of perfect competition in both input and output markets (PC/PC) is among the most extensively analyzed scenarios in Principles of Economics textbooks. However, this market structure is relatively rare outside of agriculture. In practice, most firms actively engage in product differentiation and branding—strategies that inherently violate the price-taking assumption central to perfect competition. Nevertheless, a few illustrative cases remain where the PC/PC framework closely applies, particularly in primary industries.

A classic example involves wheat farmers in the U.S. Midwest, who sell a homogeneous product on global commodity exchanges where individual producers exert no influence over price. Simultaneously, these farmers act as price takers in input markets, purchasing fertilizer, seed, fuel, and equipment from competitive suppliers. Another case is small-scale fishing boat operators, such as Southeast Asian ones, who sell fresh fish at daily auction markets, with prices determined by prevailing demand. These operators also purchase inputs from competitive local markets, such as ice, fuel, bait, and repair services.

A notable non-agricultural example is that of freelance microtask workers, such as those on platforms like Amazon Mechanical Turk. These individuals accept tasks at posted, non-negotiable prices set by requesters and rely on standardized, widely available inputs, including internet access, digital devices, and personal time. In such contexts, labor and capital inputs are sourced from markets with minimal entry barriers and high competition**,** making the PC/PC framework a useful analytical lens beyond traditional sectors.
Real-World Examples of PC/MSP Market Structure:

1. Agricultural Processing: Large agricultural processors such as Tyson Foods exemplify a dual market structure in which firms operate in highly competitive output markets while exercising monopsony power in input markets. One of Tyson's core products, chicken, is a largely homogeneous commodity; consumers treat poultry interchangeably across brands. Consequently, firms like Tyson possess limited pricing power in the downstream product market, where broader market conditions largely determine prices.

In contrast, Tyson maintains substantial market power over its upstream suppliers—mainly small-scale poultry farmers—who often operate under exclusive or tightly constrained contract arrangements. Given the limited number of alternative buyers, these producers face a localized market structure that resembles monopsony. This enables Tyson to significantly influence input prices and contract terms without formal employment relationships. Importantly, monopsony power is not confined to labor markets; it can extend to intermediate goods, raw materials, and agricultural outputs**.**

2. Apparel Manufacturing in Developing Economies: Apparel manufacturers in low-income, developing countries frequently participate in competitive global markets, particularly in fast fashion. Due to intense international price competition, these firms typically behave as price takers in the output market, with minimal ability to influence the prices at which their goods are sold.

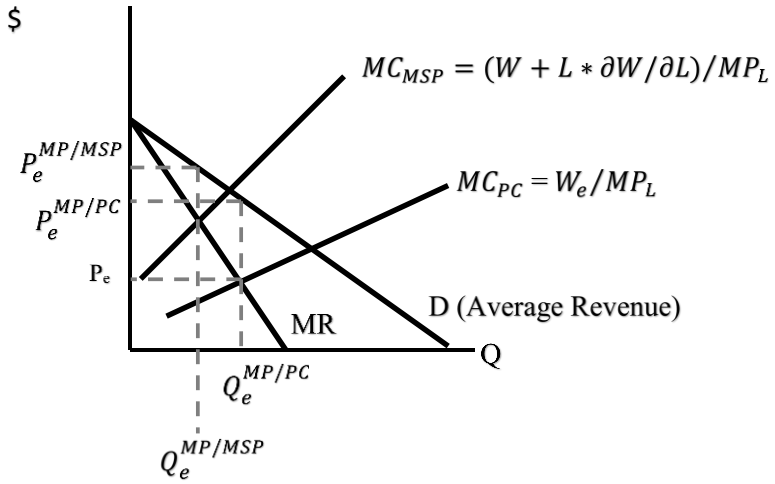
However, on the input side, many of these firms wield substantial wage-setting power over low-skilled garment workers. In numerous regions, they are the primary—if not the sole—source of formal employment, allowing them to exert monopsony-like power in the local labor market. Barriers such as geographic immobility, limited education, and the absence of competing employers restrict workers' outside options. As a result, employers can offer wages below competitive levels despite high labor intensity in production.

3. Mining in Remote Regions: Mining companies operating in geographically isolated areas often sell their output—such as coal, copper, iron ore, or lithium—on international commodity markets, where global supply and demand dynamics dictate prices. Because these outputs are standardized, firms in this sector have little or no pricing power in the product market.

Conversely, these firms often function as dominant buyers of labor in the remote regions where they operate. The mining company is the only large employer in many such localities, especially for semi-skilled and skilled workers such as machine operators, engineers, and technicians. The lack of alternative employment options gives firms considerable monopsony power in labor markets, allowing them to offer lower wages than would prevail under more competitive conditions. This is especially significant given the work's physically demanding and sometimes hazardous nature.

Market Structures MP/PC and MP/MSP in the Output Market

3: MP/PC and MP/MSP in the Output Market



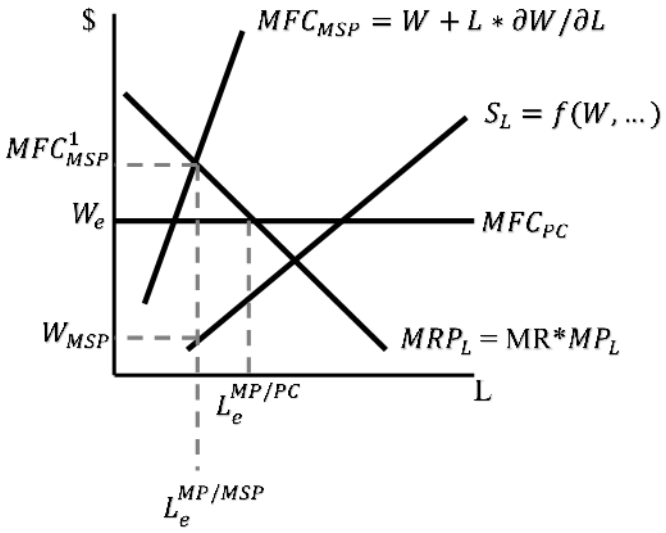
D (Average Revenue) and MR remain unchanged for cases three and four. A seller who is a perfect competitor in the labor market faces MC_{PC}. Profit maximization occurs at $Q_e^{MP/PC}$ and $P_e^{MP/PC}$. The combination of MP in the output market and PC in the labor market leads to a smaller volume of products sold at a higher price. This result is Pareto inefficient.

What happens when a seller has MP and MSP? This case is rarely discussed in undergraduate textbooks. For a defense of the MP/MSP framework see Navabi (2017). A firm with market power in both the output and labor input markets equates MR = MC_{MSP}. This further depresses the sales volume to $Q_e^{MP/MSP}$ and raises the price to $P_e^{MP/MSP}$.

One implication for both cases is that a price ceiling can be Pareto enhancing. In the case of MP in the output market and PC in the labor market, a price ceiling below $P_e^{MP/PC}$ to P_e improves Pareto efficiency. For a firm that has both MP and MSP the range of a Pareto improving price ceiling extends from $P_e^{MP/MSP}$ to P_e.

Market Structures MP/PC and MP/MSP in the Input Market

Figure 4: MP/PC and MP/MSP in the Input Market



A firm that is MP/PC maximizes profit by equating $MRP_L = MFC_{PC}$, hires $L_e^{MP/PC}$ and pays W_e. While not shown, relative to a PC/PC firm a MP/PC firm buys less labor and pays a lower wage.

The case of MP/MSP is mostly absent in Principles of Economics textbooks. The typical monopoly chapter assumes PC in the input market, and materials describing MSP often assume PC in the output market. A profit maximizer with MP and MSP equates $MRP_L = MFC_{MSP}$, hires $L_e^{MP/MSP}$ labor units and pays W_{MSP} . The presence of MSP further pushes down hiring and wages.

For the MP/MSP case, any imposed minimum wage or union-negotiated wage less than MFC_{MSP}^1 and greater than W_{MSP} creates jobs and improves market efficiency.

Real-World Examples of MP/PC Market Structure:

1. Patented pharmaceutical companies hold patents on specific drugs — such as Pfizer with Lipitor or Moderna with its COVID-19 mRNA vaccine — and enjoy monopoly power (MP) in their output markets. The patent system grants them exclusive rights to produce and sell these drugs for a fixed period, where they face no direct competition. This allows them to set prices significantly above marginal cost, often leading to high-profit margins, especially for blockbuster drugs.
   On the input side, however, these companies operate in competitive global markets. They purchase generic active pharmaceutical ingredients (APIs)**,** lab equipment, and specialized labor (e.g., chemists, researchers, clinical trial staff) from markets with many sellers with little room to influence prices. In hiring, they compete with other firms in the biotech and pharmaceutical sectors for talent, meaning broader market forces largely determine wages and supply prices**.**
2. Microsoft enjoys near-monopoly power in the output market for desktop operating systems (Windows) and office productivity software (Microsoft Office). These products benefit from strong network effects — the more people use them, the more valuable they become to others — and high switching costs, especially for enterprise customers who depend on Microsoft ecosystems. This allows Microsoft to set prices well above marginal cost, maintain premium licensing structures, and bundle services to lock in customers.

   Despite this dominant output position**,** Microsoft operates in highly competitive input markets. It hires ∫, and other skilled tech professionals from a global labor pool. In doing so, it faces stiff competition from other tech giants like Google, Amazon, Meta, and Apple — all of which offer competitive salaries and perks. As a result, Microsoft has limited wage-setting power, especially in tech hubs like Seattle or the Bay Area, where talent can move between employers relatively quickly.

3. For many years, Intel held a dominant position in the output market for high-performance central processing units (CPUs), particularly in the PC and server segments. With a large market share, strong brand recognition, and significant technological lead, Intel was able to set prices and shape product cycles across the industry. It faced limited competition, especially before AMD regained ground in the late 2010s, allowing it to price its premium chips well above marginal cost.

   On the input side**,** however, Intel has historically operated in competitive global markets. It sources silicon wafers**,** lithography machines (notably from firms like ASML), chemicals, and specialized labor — all from industries with many competing suppliers. Even though Intel maintains long-term relationships and strategic partnerships with certain vendors, it cannot unilaterally set input prices. For instance, it competes with other semiconductor manufacturers for access to cutting-edge equipment, and it must pay market rates for skilled engineers and chip designers, particularly in talent hubs like California, Arizona, and Israel.

   So, while Intel historically enjoyed pricing power in its output markets, it remained a price taker in input markets, subject to the dynamics of global competition for materials, technology, and talent.

Real-World Examples of MP/MSP Market Structure:

1. Amazon wields substantial market power on the output side, primarily through its cloud computing division, AWS (Amazon Web Services). As one of the three dominant global cloud providers — alongside Microsoft Azure and Google Cloud — AWS benefits from massive economies of scale, cutting-edge infrastructure, and high customer switching costs, giving it significant pricing power in enterprise-level cloud services. While Amazon's e-commerce arm operates in a more competitive space, it still holds category-level dominance in many product areas. Its control over the digital shelf, fulfillment networks, and Prime membership system allows it to influence

prices and market outcomes, even if it is not a textbook monopoly.

On the input side, Amazon often behaves like a monopsonist or powerful intermediary. It has considerable leverage over third-party sellers and suppliers on its e-commerce platform, pushing for lower wholesale prices, enforcing strict contractual terms, and at times, launching private-label versions of popular products based on marketplace data. It also holds bargaining power with logistics partners, delivery services (e.g., FedEx, USPS), and cloud hardware vendors, leveraging its volume to negotiate better deals. While it does not fully control input prices in the classical monopsony sense, its scale and platform power enable it to behave as a dominant buyer across multiple layers of its vast supply chain.

2. Apple products because of quality, design, privacy features, and the seamless interoperability of its hardware and software, allow Apple to set prices well above marginal cost without substantial customer churn — an unmistakable mark of monopoly-like power, even if it is not a literal monopoly.

   On the input side, Apple is equally powerful. It maintains tight control over its supply chain, using its enormous scale and prestige to negotiate favorable contracts with key suppliers like Foxconn, TSMC (chips), and Samsung (displays). Many of these firms rely heavily on Apple for a significant share of their revenue, which gives Apple considerable bargaining leverage. Although it does not own most of its manufacturing, Apple's ability to lock in production capacity, reduce demand costs, and influence component development timelines reflects a form of monopsony-like influence.

3. For much of the 20th century, De Beers functioned as a near-monopoly in the global diamond market, famously under the slogan "A diamond is forever." The company managed to control the global supply of diamonds, not by owning every mine, but by maintaining a centralized "single channel" distribution system. Through this, De Beers could stockpile diamonds and artificially restrict supply, thereby keeping prices high and stable. De Beers had extraordinary pricing power in the output market by purchasing diamonds from other producers and requiring them to sell through its network. Consumers and retailers had little influence over pricing, and the company's practices shaped global diamond valuation for decades.
   On the input side, De Beers also exerted considerable control. The firm owned or controlled a large share of diamond mines in Southern Africa and had exclusive purchasing agreements with others, giving it dominance over raw diamond inputs. This allowed De Beers to set terms with miners, labor forces, and contractors**,** often in regions with scarce alternative employment or buyers. In some cases, it operated as both a monopolist and a monopsonist — setting the price at which it bought uncut diamonds and the price at which it sold them. De Beers remains a textbook example of a firm that once held power on both supply chain ends**.**

SOURCE MATERIALS

Many economics instructors are unfamiliar with the modern monopsony literature. Our article presents the traditional modeling of monopsony to fit traditional textbooks. We recommend an approach that combines our illustrations with the modifications of the monopsony theory found in the current literature. Below, we cite recommended articles and books that explain the historical and modern approaches to monopsony theory.

1. (Han, 2025) "Human Capital Transferability and Employer Monopsony Power." (Dissertation)
   Brief description: An analysis of monopsony power from the perspective of limits on human capital transferability across occupations. Han finds occupational switches are associated with significant wage penalties, and combining general education and vocational training can potentially reduce labor market power.
2. (Manning, 2021) *"*Monopsony in Labor Markets: A Review.*"* (*ILR Review)*
   Brief description: An overview of monopsony theory plus empirical developments since his 2003 book.
3. (Sokolova & Sorensen, 2021) "Monopsony in Labor Markets: A Meta-Analysis." (*ILR Review*)
   Brief description: An analysis of monopsony power using the elasticity of labor supply to compare studies that estimate parameters of monopsony power.
4. (Azar et al., 2022) "Labor Market Concentration" (*Quarterly Journal of Economics)*
   Brief description: They demonstrate that higher labor market concentration is associated with significantly lower posted wages, suggesting employers in more concentrated markets have greater wage-setting power.

5. David Card, Alan Manning, and Patrick Kline (2016). "Bargaining and Monopsony in Labor Markets: A Retrospective" (*ILR Review)*
   Brief description: This article reflects on the evolution of monopsony theory and its relevance to wage-setting and inequality. It introduces wage bargaining models and shows that search frictions and worker-specific preferences can lead to monopsony power even with multiple employers.
6. (Webber, 2015) – "Firm Market Power and the Earnings Distribution" (*Labour Economics)*
   Brief description: This paper uses U.S. administrative data to estimate the labor supply elasticity at the firm level, showing that many firms have considerable wage-setting power, especially at the low end of the wage distribution.
7. (Manning, 2005) – *Monopsony in Motion: Imperfect Competition in Labor Markets* (Book)
   Brief description: This is the foundational text for modern monopsony theory. Manning argues that labor markets are not perfectly competitive, even when multiple employers exist, due to search frictions**,** mobility costs**,** and imperfect information**.** The book formalizes monopsony models that are dynamic and empirically relevant, emphasizing how employers can have wage-setting power without being literal monopolists
8. Joan Robinson (1933) – *The Economics of Imperfect Competition* (Book)
   Brief description: This is the original conceptualization of monopsony, particularly in labor markets. Robinson introduced the term monopsony to describe a market with a single buyer and explained how it mirrors monopoly on the demand side.

CONCLUSION

Two observations motivate this paper. First, monopsony power is an empirically documented and conceptually robust feature of many real-world economic environments. Second, monopsony power has significant implications for public policy concerning wage determination, labor market regulation, and antitrust enforcement. Despite its relevance, monopsony power remains underrepresented in introductory microeconomics curricula**,** where market power is often discussed solely in the context of monopoly in output markets.

We argue that it is essential for instructors of Principles of Microeconomics to introduce students to the concept of monopsony power, to provide engaging and accessible examples, and to articulate its broader economic and policy consequences. This article represents an initial step in supporting that effort. We aim to assist instructors by supplying clear theoretical frameworks**,** real-world illustrations, and suggesting some of the normative implications of monopsony power in labor markets. In doing so, we hope to contribute to a richer and more accurate representation of market structure in undergraduate economics education.

REFERENCES

Ashenfelter, O. C., Card, D., Farber, H. S., & Ransom, M. (2021). *Monopsony in the Labor Market: New Empirical Results and New Public Policies* (Working Paper No. 29522). National Bureau of Economic Research. https://doi.org/10.3386/w29522

Azar, J., Marinescu, I., & Steinbaum, M. (2022). Labor Market Concentration. *Journal of Human Resources*, 57(S), S167–S199. https://doi.org/10.3368/jhr.monopsony.1218-9914R1

Friedman, M. (2007). *Price Theory* (First Edition). Routledge.

Han, Q. (2025). *Human Capital Transferability and Employer Monopsony Power*. SSRN. https://doi.org/10.2139/ssrn.5185746

Manning. (2005*). Monopsony in Motion: Imperfect Competition in Labor Markets* by Alan Manning. Princeton U, Paperback.

Manning, A. (2021). Monopsony in Labor Markets: A Review. *ILR Review*, 74(1), 3–26. https://doi.org/10.1177/0019793920922499

Navabi, A (2017). *A Monopsony Is Necessarily a Monopoly.* SSRN. https://C:/Users/brown/Downloads/SSRN-id2972793.pdf.

Robinson, J. (1969). *The Economics of Imperfect Competition*. Springer.

Sokolova, A., & Sorensen, T. (2021). Monopsony in Labor Markets: A Meta-Analysis*. ILR Review*, 74(1), 27–55. https://doi.org/10.1177/0019793920965562

Webber, D. A. (2015). Firm market power and the earnings distribution. *Labour Economics*, 35, 123–134. https://doi.org/10.1016/j.labeco.2015.05.003

Author Bios

Dr. Mark Nadler holds the A.L. Garber Family Chair in Economics at Ashland University, where he teaches economics and business analytics at both the undergraduate and MBA levels. His current work focuses on advancing the pedagogy of technical instruction, particularly improving how complex theoretical concepts are taught and understood.

Dr. Jeff Russell holds the Rupp Family Chair in Economics at Ashland University where he is the Chair of the Department of Economics, Finance and Business Analytics. He teaches economics and game theory at both the

undergraduate and MBA levels. His current work focuses on the simulation of market structures and data visualization.

APPENDIX

Definitions in alphabetical order:
D_L = Demand for labor, equal to the value of labor's marginal product, assumes that the firm is a perfect competitor in its output market
D (Average Revenue) = Demand curve for a firm that has monopoly power
L = Labor hired
MC_{MSP} = Marginal cost assuming monopsony power in the labor market
MC_{PC} = Marginal cost assuming perfect competition in the labor market
MFC_{MSP} = Marginal factor cost assuming a firm has monopsony power in the labor market, equals the cost of hiring an additional unit of labor
MFC_{PC} = Marginal factor cost assuming a firm is a perfect competitor in the labor market, equals the cost of hiring an additional unit of labor
MP_L = Marginal product of labor
MR_{PC} = Marginal revenue assuming the firm is a price taker in its output market
MR_{MP} = Marginal revenue for a monopoly firm
MRP_L = Marginal revenue product for a firm that is a monopolist
P_e = Given output price
Q = Output
S_L = Labor supply
VMP_L = The value of the marginal product of labor, assuming the firm is PC in the output market
W_e = Given equilibrium wage, assuming the firm is PC in the labor market
W_{MSP} = Wage set by a monopsonist
$\partial W/\partial L$ = Partial derivate of the wage rate for hired labor, assumed to be positive

Profit Maximizing Conditions
PC/PC (Output market): $P_e = MC_{PC}$
PC/PC (Input market): $W_e = VMP_L$

PC/MP (Output market): $P_e = MC_{MSP}$
PC/MSP (Input market): $VMP_L = MFC_{MSP}$

MP/PC (Output market): $MR_{MP} = MC_{PC}$
MP/PC (Input market): $MRP_L = MFC_{PC}$

MP/MSP (Output market): $MR_{MP} = MC_{MSP}$
MP/MSP (Input market): $MRP_L = MFC_{MSP}$

Derivation of MC_{MSP}
Marginal cost equals the cost of hiring an additional unit of labor divided by that labor unit's marginal product. For a price taker in labor markets, this reduces to W_e/MP_L. For a monopsonist, the numerator of this ratio equals $(W + L* \partial W/\partial L)$. It is derived by taking the derivative of W(L)*L with respect to L where W(L) is the labor supply curve and L is hired labor: (W + L*$\partial W/\partial L$.). Given that the labor supply curve is positively sloped, (W + L*$\partial W/\partial L$) is greater than W.

Derivation of MFC_{MSP}
MFC_{MSP} differs from MFC_{PC} in that MSP firms must pay a higher wage as they hire additional labor. This is captured by W + L*$\partial W/\partial L$.

Exploring the Effectiveness of Electronic Service-Learning in Business Education: A Comparative Analysis with Traditional Service-Learning

Retha A. Price, Mississippi College - Clinton, Mississippi, USA
Tammy Y. Arthur, Mississippi College - Clinton, Mississippi, USA
Kevin P. Pauli, Mississippi College - Clinton, Mississippi, USA

ABSTRACT

Many studies have documented the benefits of service-learning where students engage in community service activities that enhance understanding of course content. With the growth of online education, electronic-service learning (E-SL) has emerged as a means of providing experiential learning opportunities for online students. Research, however, on the efficacy of E-SL is limited and the results are mixed. This paper presents and tests a framework for comparing traditional SL and E-SL in undergraduate business courses, focusing on potential differences in experiences and learning outcomes. Our pilot study showed that both SL and E-SL students reported similar experiences in terms of reflection activities and academic content integration, but differences in community partner interaction. Additionally, students across both delivery modes reported similar academic and professional skills outcomes, while students engaged in E-SL reported lower attainment in civic learning.

Keywords: electronic-service-learning, online service-learning, service-learning, online learning

INTRODUCTION

Business schools face the challenge of not only equipping students with a sound understanding of essential business principles but also fostering their sense of social responsibility and ethical leadership. Service-learning (SL) has emerged as a promising pedagogical approach to meet this challenge by integrating community service with academic goals. Business educators have adopted SL in part because of its effectiveness in generating positive student outcomes such as improved academic achievement, enhanced personal development, and increased civic engagement.

The rise of SL aligns with the increased enrollment trends in online education. Between 2012 and 2019, online student enrollment at traditional universities surged by 36 percent, a growth further propelled by the Covid-19 pandemic (Faulk, Rivera, & Smith, 2022). In response, universities have explored methods to ensure a high-quality virtual learning experience, including the adoption of electronic-service-learning (E-SL), a pedagogy that incorporates service-learning experiences partially or entirely online. With the growth in online education, the use of E-SL is likely to become more widespread. Unlike traditional SL, however, E-SL lacks extensive research.

This exploratory study seeks to address this gap in research by proposing a framework to evaluate the effectiveness of E-SL in undergraduate business courses. Specifically, we address potential differences in learning outcomes between E-SL and traditional SL and explore factors that may contribute to these differences. Our goal is to present a framework for investigating the efficacy of E-SL and its potential for improving the online learning experience.

LITERATURE REVIEW

Service Learning

Service-learning is a popular instructional approach adopted by colleges and universities worldwide. Bringle and Hatcher (1999) define SL as:

> "… a course-based, credit-bearing educational experience in which students participate in an organized service activity that meets identified community needs and reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the academic discipline, and enhanced sense of civic responsibility." (p. 180)

SL courses give students the opportunity to apply knowledge and skills taught in the classroom to projects or activities that benefit the community. Thus, SL emphasizes the reciprocal relationship between learning and service.
Originally, SL emphasized direct student interaction with community partners to address specific needs. Examples of

direct SL include activities such as tutoring, volunteering at shelters, or assisting older adults. More recently, SL has broadened to encompass indirect activities that support community partners remotely. Examples of indirect SL include activities such as creating marketing campaigns, analyzing data, or providing other deliverables that benefit a service partner. Thus, multiple forms of SL provide students with many opportunities to address community partner needs.

The benefits of SL are well documented. A comprehensive literature review conducted by Salam et al. (2019) revealed that across a range of academic disciplines SL facilitated students' academic achievement, critical thinking, communication and interpersonal skills, and civic engagement. These findings align with past meta-analysis studies which found significant improvements in students' academic achievement, personal and social skills, attitude towards self and learning, and civic engagement (Celio et al., 2011; Conway et al., 2009; Warren, 2012; Yori and Ye, 2012). Additionally, a literature review examining SL's impact on business students found similar outcomes including enhanced knowledge, social interaction, personal development, and civic engagement (Marco-Gardoqui et al., 2020).

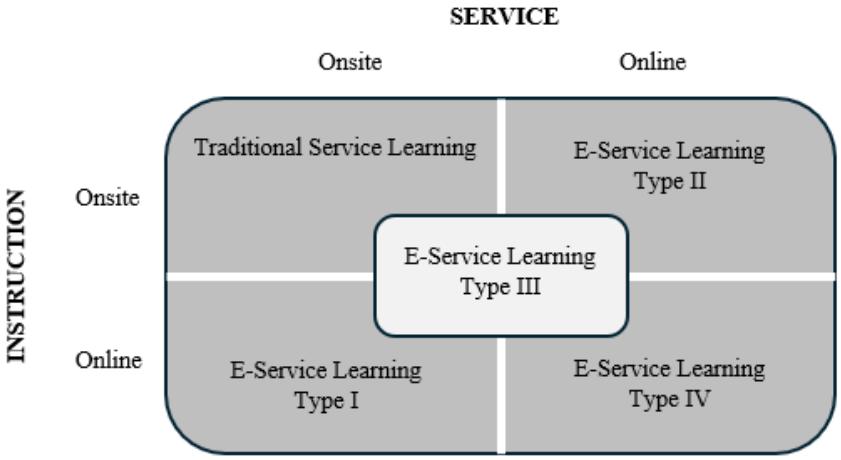
E-Service Learning

E-SL is a service-learning course where the instruction and/or the service occur online (Waldner et al., 2012). More specifically, Malvey et al. (2006) define it as:

> "… an electronic form of experiential education which incorporates electronically supported service-learning. It is delivered online and uses the Internet and state of the art technologies that permit students, faculty, and community partners to collaborate at a distance in an organized, focused, experiential service-learning activity, which simultaneously promotes civic responsibility and meets community needs." (p. 187)

To provide further clarification, Waldner et al. (2010) categorize E-SL into four types based on the delivery of teaching and service components. Traditional SL involves conducting both components in-person or onsite. Type I E-SL features online teaching with onsite service delivery. In Type II, teaching occurs onsite while the service project is conducted online. Type III combines partially online teaching and service components in a hybrid format. Lastly, Type IV, also termed extreme e-service-learning, involves fully online delivery of both instruction and service components. The present study focuses on Type IV where both service and instruction are conducted online.

Figure 1: Types of E-Service Learning



Prior to COVID-19, few studies investigated the learning outcomes of E-SL. In a review of E-SL in major literature databases, Marcus et al. (2020) identified two publications investigating student learning outcomes. McGorry (2012) compared the learning outcomes of students in traditional and online SL courses in marketing and found no significant differences. Schwehm et al. (2017) examined the learning outcomes of students who participated in either on-site or online service and found that the students participating in the onsite service reported higher learning in civic responsibility, but no significant differences in the other outcomes.

The onset of the COVID-19 pandemic prompted SL classes to transition online. Subsequently, more studies investigated E-SL and its outcomes. Schmidt (2024) surveyed students enrolled in a developmental psychology course with an E-SL component. Students reported positive learning experiences and perceived that E-SL assignments helped

them develop critical thinking skills. Similarly, Plata and Moredo (2021) investigated student perceptions of an online SL experience. Students acknowledged the role of E-SL in achieving course objectives and fostering collaboration, teamwork, and civic responsibility. Interestingly, (Wong and Lau, 2022) found that E-SL outperformed traditional SL in enhancing student outcomes such as knowledge application, problem-solving and team building.

One of the few large-scale, multi-disciplinary studies on E-SL found that while E-SL was effective in enhancing students' cognitive outcomes, it was less effective than traditional SL in facilitating civic learning outcomes (Ngai, Lau, and Kwan, 2024). Their investigation of students' learning experiences suggested that online communication might have affected interaction with the community partner, potentially influencing the effectiveness of E-SL.

Despite the contributions of earlier studies on E-SL, limitations in existing literature point to areas that require further investigation. First, there are mixed findings regarding the comparative effectiveness of E-SL versus traditional SL. Secondly, most studies have assessed student learning outcomes without examining potential influencing factors. Varied outcomes may be a function of differences in course design and student experiences rather than the delivery method used. Thus, there is a need to investigate the learning experiences that may impact these outcomes.

RESEARCH FRAMEWORK AND HYPOTHESES

Although E-SL can increase access to service opportunities for online students, it is unclear if there are differences in experiences and learning outcomes for students participating in E-SL courses compared to those participating in traditional SL. The primary purpose of this paper is to establish a framework to investigate the following questions.

1. Are there significant differences in the learning outcome measures reported by students participating in traditional SL classes versus E-SL (Type IV) classes?

2. Are there significant differences in the learning experiences reported by students participating in traditional SL classes versus E-SL (Type IV) classes?

3. To what extent are students' reported learning experiences related to their reported learning outcomes?

Theoretical Foundation

A key theoretical foundation for SL draws from David Kolb's (1984) Experiential Learning Theory. Kolb's theory posits that learning occurs through concrete experiences, reflective observation, abstract conceptualization, and active experimentation. SL aligns closely with Kolb's theory as students engage with community members, gaining concrete experiences that serve as the foundation for learning. After engaging in service activities, students reflect on their experiences. Through reflection, students make sense of their experiences and draw connections with academic concepts. Abstract conceptualization allows them to explore how their service experiences relate to course material and broader societal issues. They may explore how social issues discussed in the classroom relate to the challenges encountered during the service activities. SL also promotes active experimentation as students apply their knowledge to real-world problems, fostering problem-solving skills.

Learning Outcomes

Learning outcomes are statements that describe what students should know, understand, or be able to do after they have completed a course. SL research has yielded a broad spectrum of identified outcomes. Academically, SL has been shown to deepen students' understanding of academic content and increase their ability to apply knowledge and skills in real-life service settings. (Prentice and Robinson, 2010; Warren, 2012). From a personal skills standpoint, studies have found that SL contributes to students' communication, interpersonal, and leadership skills (Celio et al., 2011; Fullerton, et al., 2015; Wurr and Hamilton, 2012). Civic learning outcomes associated with SL include increases in students' sense of civic responsibility and engagement, awareness and understanding of social issues, empathy for others, and willingness to volunteer (Weber and Weber, 2010; Winston, 2015). Ash and Clayton (2009) were among the first to establish a conceptual framework categorizing learning outcomes into three distinct domains. Their model aligns with previous research findings indicating that service-learning can enhance student learning in terms of academic enhancement; personal and professional skills; and civic learning.

Academic enhancement denotes the degree to which students comprehend course content knowledge and apply it to real-world situations, thereby deepening their understanding of academic concepts. *Personal and professional skills*, in contrast, encompass the soft skills distinct from factual knowledge. These skills include problem-solving, critical

thinking, creativity, teamwork, and leadership. Lastly, *civic learning* refers to the extent to which a person is inclined to care about the community and engage in community affairs. This is reflected in a sense of social responsibility, a willingness to contribute, a commitment to social action, engagement in community service, and empathy towards others (Snell and Lau, 2020).

Researchers have encountered mixed findings when comparing learning outcomes between traditional and E-SL environments. The variability in outcomes may stem from differences in learning experiences. It remains unclear whether students participating in fully online SL classes have different experiences compared to those involved in traditional SL. E-SL may present both challenges and opportunities that impact student experiences and lead to varied leaning outcomes. Based on a review of the literature, our model proposes four student experiences that may influence the learning outcomes of students participating in traditional SL and E-SL. They include community partner interaction, communication format, reflection experience, and integration of academic content (Celio et al., 2011).

Community Partner Interaction

Ngai et al. (2024) found that students in E-SL reported less interaction with service recipients than traditional SL students, leading to less immersive experiences. According to Herman et al. (2017), students in E-SL courses reported lower satisfaction with the quality of their interactions with community partners compared to those in traditional SL courses. Their study highlighted the importance of face-to-face interactions in building meaningful relationships and fostering community engagement. Mabry (1998) observed that students with frequent contact with beneficiaries showed significantly higher post-course civic attitudes than those with little or no such contact. Ngai et al. (2018) found that direct interaction with the service recipient was a significant predictor of students' civic learning outcome. Finally, Wong and Lau (2024) found that students engaged in E-SL projects demonstrated lower attainment in civic engagement compared to their onsite counterparts. Based on these findings, the following hypotheses are formulated:

Hypothesis 1a: Higher levels of interaction between students and their community partners will be associated with higher reported levels of civic learning.

Hypothesis 1b: Students participating in traditional SL will report higher levels of interaction with their community partners than students participating in E-SL.

Hypothesis 1c: Students participating in traditional SL will report higher levels of civic learning than students participating in E-SL.

Nature of Online Communication

Establishing and maintaining communication can be challenging in E-SL courses since the participants do not interact face-to-face. Instead, E-SL must rely on digital communication tools such as email, discussion forums, and video conferencing for collaboration and interaction. Additionally, online students may encounter unanticipated technical hurdles including platform usability problems or incompatible software. While frustrating, these challenges may generate opportunities to apply and practice problem-solving skills.

Giallo et al. (2020) investigated the impact of communication format in E-SL courses. They found that students reported more challenges in maintaining in-depth discussions compared to face-to-face interactions in traditional SL settings. Kim (2009) found that the challenges of online communication stimulated problem-solving skills among learners. By navigating these challenges, learners developed cognitive flexibility. While this study did not specifically focus on SL contexts, it demonstrated how online communication challenges can foster critical thinking skills.

In their comparison of student learning outcomes between traditional SL and E-SL courses, Wong and Lau (2022) found that students in the E-SL cohort reported greater increases in problem-solving skills than those in the traditional SL cohort. They suggested that the students who worked as virtual teams in the E-SL cohort needed to improvise by themselves to solve problems when support from other stakeholders was not available. Additionally, Yusof et al. (2019) and Marcus et al. (2019) found that students gained skills in online collaboration and teamwork when the SL activities were conducted through an online platform. Based on these findings, the following hypotheses are formulated:

Hypothesis 2a: Higher reliance on online communication technologies will be associated with higher reported personal and professional skills growth.

Hypothesis 2b: Students participating in E-SL will report higher personal and professional skills growth

compared to students participating in traditional SL.

Reflection Experience

Service-learning reflection refers to deliberate exercises designed to encourage students to critically analyze and evaluate their service experiences in connection with course content, personal development, and societal impact. These exercises typically involve structured prompts, discussions, journaling, or other activities that encourage students to reflect on their service activities. Reflection has been described as "the hyphen in service-learning; it is the link that ties student experience in the community to academic learning" (Eyler & Giles, 1999, p. 171).

Studies highlight the positive impact of quality reflection exercises on student learning outcomes in SL settings. Reflection exercises help students develop a deeper understanding of course content by connecting theory to real-world experience (Bringle and Hatcher, 1999; Hatcher et al., 2004). Courses that incorporate more frequent and more structured reflections have a greater impact on student learning outcomes. Moledo (2021) found that learning outcomes were higher when the student was engaged in reflection activities from the beginning to the end of the SL project. Similarly, Mabry (1998) found that when students regularly participated in a form of ongoing reflection, they demonstrated higher gains in learning outcomes.

While quality reflection experiences in traditional SL are positively associated with higher academic achievement, results are mixed when investigating these relationships in E-SL. Although E-SL can facilitate reflection activities, some research suggests that traditional SL settings result in higher-quality reflection experiences. In traditional SL, reflection activities may be integrated into classroom discussions or facilitated through in-person interactions with instructors and peers. In E-SL, reflection assignments may take place asynchronously through online platforms, requiring students to articulate their thoughts and insights digitally. In a large-scale study comparing the effectiveness of E-SL to traditional SL, Ngai et al. (2024) found that students in E-SL classes were less likely to perceive that they were provided with clear instructions for reflection or received insightful feedback. Conversely, in a study conducted by Guthrie and McCracken (2014) students reported that the reflection process was easier and richer with the use of online technology in E-SL. They found that intentionally structured reflecting activities supported collaborative learning when using online technology.

We propose that these mixed findings are a result of differences in the quality of the reflection experience rather than the delivery mode of the service-learning class. Wong and Lau (2022) found that both traditional SL and E-SL cohorts showed significant improvement in knowledge application after the SL experience. Their qualitative analysis suggested that good practices including continuous student reflections helped students deal with the challenges posed by the online environment. Based on these observations, the following hypotheses are formulated.

Hypothesis 3a: Higher levels of reflection experience quality will be associated with higher levels of academic enhancement.

Hypothesis 3b: There will be no significant differences in the level of reflection experience quality when comparing E-SL and SL cohorts.

Hypothesis 3c: There will be no significant differences in the level of academic enhancement when comparing E-SL and SL cohorts.

Academic Content Integration

Service-learning requires students to learn academic content and then apply their knowledge and skills in a service activity that benefits the community. Learning outcomes improve as they engage in the process of practicing the knowledge and skills they have acquired. While both E-SL and traditional SL offer opportunities for student learning and community engagement, the differences in student experiences between the two teaching modes highlight the need for careful consideration of instructional design. As Novak et al. (2007) point out: "A title like service-learning does not guarantee improvement in outcomes unless the process is linked to desirable and clear procedures and goals."

Researchers have identified best practices for instructors to consider when designing SL courses. Among different best practices, academic content integration is frequently cited. (Eyler and Giles, 1999; Billig and Furco, 2002; Lambright and Lu, 2009; Skinner and Chapman, 1999). In fact, some studies show that the integration of academic content with the service experience is the most significant correlate to academic achievement and confirms the importance of this core issue (Bringle and Hatcher, 1995; Marcus et al., 1993). Moely and Ilustre (2014) found that learning outcomes

were strongly linked to the student's perceived value of the service. They found that if students had a clear understanding of the value of the service, their motivation would increase, which improved their cognitive learning. Largent (2009) showed that students' academic learning from SL was affected by their ability to connect course material and the service experience and the extent to which they believed the service had an impact on the community.

Based on these findings it is believed that when instructors carefully design the service-learning course to align learning objectives and course content with the service experience, students will perceive the value of the service. This will lead to greater effort on the part of students and improved student academic enhancement. To date there is no research comparing the differences in academic content integration between traditional SL and E-SL. Based on these observations, the following hypotheses are formulated.

Hypothesis 4a: Higher levels of academic content integration will be associated with higher levels of academic enhancement.

Hypothesis 4b: There will be no significant differences in levels of academic content integration when comparing E-SL and SL cohorts.

RESEARCH DESIGN

This pilot study compares student experiences and learning outcomes between traditional SL and E-SL cohorts. To do this we compared two groups of undergraduate students enrolled in two different sections of Integrated Marketing Communications (IMC) courses, one delivered face-to-face (SL) and the other fully online (E-SL Type IV). All the course settings, including the instructor, curriculum, course structure and duration, assessment methods, types of SL conducted, and SL community partners were kept the same for both the face-to-face and online cohorts. Since the courses were taught by the same instructor with the same structure, during the same semester and over the same period, many possible confounding variables were controlled to make sure the comparisons were valid.

Course Design and Structure

The service-learning project was designed to engage students in the application of IMC principles by having them develop an IMC plan and marketing materials for a community partner. Both classes followed a 16-week semester schedule, with the project integrated into the curriculum as a key learning component. The project was designed to match the course content. The instructor guided the teams through stages of the project providing frequent feedback and ensuring that the work was aligned with the course content and the partner's needs.

Team Formation and Collaboration

Students in both the face-to-face (SL) and online (E-SL) cohorts were organized into small teams, which worked together to create the deliverables. While students in both cohorts collaborated in teams, their methods of communication and project coordination varied. For the E-SL cohort, the instructor and students used technology to bridge the gap created by the lack of face-to-face interaction. Tools like Zoom, Canvas, Gmail, and Google Drive were used to facilitate communication and share documents. The face-to-face class held in-person meetings which fostered direct interaction between students and the instructor.

Community Partner Interaction

To ensure productive meetings with the community partner, the instructor arranged opportunities for all students to meet with the partner simultaneously. Community partners visited the face-to-face class on two separate occasions including: (1) an introductory session to brief students about the project and the requested products, and (2) a question-and-answer session for students to obtain background information needed for the project. In the case of the E-SL cohort, students had the option to attend these sessions in person or to participate through Zoom, thus ensuring that students in the online class had access to these interactions. These sessions allowed students to gain firsthand insights into the community partner's goals and expectations which helped shape their marketing communication plans.

Reflection and Deliverables

To encourage critical thinking and personal growth, students participated in regular reflection exercises. These activities were designed to help students evaluate their own contributions to the team, reflect on the impact of the service-learning project, and connect the work they were doing to the course content. At the end of the semester, student teams submitted their final marketing communications plans. These plans included a variety of marketing materials tailored to the partner's needs.

Measurement Instruments

A self-report measurement instrument was used to collect and compare the learning experiences and outcomes of the SL and E-SL cohorts. Service-learning outcomes were measured using a service-learning outcomes scale developed by Moely and Ilustre (2014). Supplemental items were drawn from an instrument designed by Geringer et al. (2009) which also assessed SL outcomes. The resulting seventeen-item scale measured outcomes in three categories including academic enhancement, civic learning, and personal and professional skills. Students were asked to identify the extent to which they agreed or disagreed with statements on a five-point Likert scale with five being "strongly agree."

Student learning experiences were measured using a ten-item instrument inviting students to indicate their perceptions of the (a) reflection experience, (b) community partner interaction, and (c) academic content integration. Items were drawn from a Student Learning Experiences scale developed by Lo et al., (2022). Their survey instrument was rigorously tested and validated. Some adjustments were made to incorporate questions relevant to the learning experiences which were the focus of this study.

Measures

The means, standard deviations, and correlations among the variables in the study are shown in Table 1. Participant gender (m=1, f=2) was captured along with age, class standing, and self-reported amount of time spent on the course each week as control variables. Only gender had a significant correlation with any of the variables as shown in Table 1. A t-test was run for each control variable against group and only previous service-learning course experience showed a marginally significant difference ($t(31)=-2.268$ $p<.05$), likely due to the traditional SL format and higher number of students. This was also reflected in a marginally significant correlation as shown in Table 1.

Table 1: Means, Standard Deviations, and Inter-correlations Among All Variables

	$\bar{x}$	SD	Academic Enhancement	Academic Content Integration	Civic Learning	Community Partner Interaction	Personal and Professional Skills	Reflection Experience	Course Code	Gender	Age	Average time spent on course	Year in School
Academic Enhancement	4.16	0.66											
Academic Content Integration	4.43	0.49	0.836***										
Civic Learning	3.47	0.65	0.409*	0.549***									
Community Partner Interaction	3.61	0.98	0.327	0.460**	0.764***								
Personal and Professional Skills	4.27	0.56	0.657***	0.698***	0.265	0.403*							
Reflection Experience	4.57	0.42	0.578***	0.539**	0.284	0.463**	0.628***						
Course Code	1.7	0.47	0.160	0.320	0.768***	0.889***	0.103	0.158					
Gender	1.55	0.51	0.372*	0.347*	-0.057	-0.141	0.527**	0.218	-0.337				
Age	21.7	0.81	-0.247	-0.253	0.158	0.159	-0.087	-0.123	0.163	-0.271			
Average time spent on course	2.97	1.13	0.602***	0.537**	-0.023	0.054	0.692***	0.453**	-0.195	0.631***	-0.181		
Year in School	3.85	0.44	0.063	0.023	0.253	0.362*	0.261	0.195	0.225	-0.038	0.654***	0.053	
Previous service-learning courses	0.85	0.62	0.183	0.199	0.305	0.412*	0.237	0.220	0.377*	-0.027	0.030	0.261	0.142

NOTE: n=33, * p<.05, ** p< .01, ***p<.001

FINDINGS

The results of our pilot study indicated support for several of our hypotheses. Table 2 provides a summary of hypotheses and findings.

Table 2: Hypotheses and Results

	Hypotheses	Results
H1a	Higher levels of interaction between students and their community partners will be associated with higher reported levels of civic learning.	Supported
H1b	Students participating in traditional SL will report higher levels of interaction with their community partners than students participating in E-SL.	Supported
H1c	Students participating in traditional SL will report higher levels of civic learning than students participating in E-SL.	Supported
H2a	Higher reliance on online communication technologies will be associated with higher reported personal and professional skills growth.	Not Supported
H2b	Students participating in E-SL will report higher personal and professional skills growth compared to students participating in traditional SL.	Not Supported
H3a	Higher levels of reflection experience quality will be associated with higher levels of academic enhancement.	Supported
H3b	There will be no significant differences in the level of reflection experience quality when comparing E-SL and SL cohorts.	Supported
H3c	There will be no significant differences in the level of academic enhancement when comparing E-SL and SL cohorts.	Supported
H4a	Higher levels of academic content integration will be associated with higher levels of academic enhancement.	Supported
H4b	There will be no significant differences in levels of academic content integration when comparing E-SL and SL cohorts.	Supported

Support was found for hypothesis H1a in that higher reported levels of interaction between students and their community partners were associated with higher reported levels of civic learning. As shown in Table 1, the correlation was positive and significant between civic learning and community partner interaction ($r(33) = .764$, $p<.001$). The second hypothesis H1b was also supported as the mean for interaction with community partners for the online group was 2.30 (SD = .29) and the mean for the traditional group was 4.17 (SD = .51). According to our ANOVA, this was a significant difference between the groups $F(1,31)=116.47$ $p<.001$. Hypothesis H1c was also supported as the mean for level of civic learning for the online group was 2.72 (SD = .27) and the mean for the traditional group was 3.79 (SD = .47). According to our ANOVA, this was a significant difference between the groups $F(1,31)=44.485$ $p<.001$. These results support the idea presented that E-SL results in lower reported levels of interaction with community partners and reported civic learning.

Our results found no support for our hypotheses that E-SL may enhance students' personal and professional skills. Hypothesis 2a that higher reliance on online communication technologies in E-SL will be associated with higher reported personal and professional growth was not supported as the correlation between course delivery method (online vs traditional) and personal and professional skills was not significant ($r(33)=.103$, $p>.10$). Results also did not support our Hypothesis 2b supposition that those in the E-SL group would report higher personal and professional skills compared to those in the traditional SL classroom. The mean for personal and professional growth for the online group was 4.19 (SD = .53) and the mean for the traditional group was 4.31 (SD = .58). Our ANOVA indicated the difference in means was not significant $F(1,31)=.334$ $p>.10$.

Our hypotheses that differences in the quality of students' reported levels of reflection experience and academic enhancement would be related to each other and not be related to delivery mode was supported. Hypothesis H3a was supported as the correlation was significant and positive between reflection experience quality and academic enhancement ($r(33)=.764$, $p<.001$). Hypotheses 3b and 3c were both also supported as ANOVA found the means for the two variables were not significantly different between the E-SL and traditional SL groups. The mean for level of reflection experience for the E-SL group was 4.47 (SD = .39) and the mean for the traditional group was 4.61 (SD = .43) which according to our ANOVA, were not significantly different between the groups $F(1,31)=.789$ $p>.10$ The same non-significant ANOVA result $F(1,31)=.815$ $p>.10$ was found for the level of academic enhancement when comparing the means for E-SL ($\bar{x}$=4.00 SD = .71) and SL cohorts ($\bar{x}$=4.23 SD = .64).

The final pair of hypotheses examined the extent of academic content integration and its relation to improved student academic enhancement regardless of delivery mode. Hypothesis 4a was supported as a significant positive correlation

was found between reported levels of academic content integration and reported levels of academic enhancement ($r(33)=.836$, $p<.001$). Hypothesis 4b was also supported as the ANOVA results suggest that there was not a significant perceived difference $F(1,31)=3.534$ $p>.05$ in academic content integration between the E-SL ($\bar{x}=4.20$ SD = .50) and traditional SL groups ($\bar{x}=4.53$ SD = .45).

CONCLUSIONS

This paper presents a framework for understanding the effectiveness of electronic-service-learning and how it can be used to enhance the online learning process, both in terms of student learning outcomes and student learning experiences. Hypotheses are offered which help explain how student interaction with community partners, reliance on online communication technologies, reflection quality, and academic content integration affect civic learning, personal and professional growth, and academic enhancement. In addition, we examined how outcomes differ between the traditional SL and E-SL methods.

Results from our study show that students in both traditional and electronic SL had comparable reflection experience quality and therefore comparable academic enhancement. This finding is significant in that it shows that service learning in an online class is viable and can lead to greater student learning just as it does in a traditional class. A determining factor is the establishment of continuous and high-quality student reflections regardless of delivery method. These reflections should follow SL best practices, including maintaining a strong connection to course learning objectives, using structured prompts, and ongoing reflection throughout the learning process.

Another key finding from our study is that SL and E-SL students experienced similar levels of academic content integration. Perhaps the most important outcome of a successful SL experience is the ability to apply knowledge and skills gained in a way that is of value both to student learning and to the community as a whole. Given that there is no prior research comparing the differences in academic content integration between traditional SL and E-SL, this is a significant contribution of our research.

One challenge inherent in E-SL is fostering meaningful interaction among students and community partners. Online platforms may not provide the same level of engagement as physical interactions available in face-to-face settings. Students may have fewer opportunities to directly interact with community partners. Consequently, they may feel less connected to the community they are serving or the issues they are addressing. This can impact students' ability to develop empathy and understanding of the community partner's needs.

Our findings show that students in traditional SL did report higher levels of interaction with community partners and civic learning than E-SL students. This barrier to E-SL can be mitigated if educators devote extra attention to fostering more sustained engagement with community partners when in an online setting. Additional assignments such as research into the goals of the community partner or interaction with related organizations might also help enhance civic learning for E-SL classes.

The finding of no difference in academic content integration between SL and E-SL is not surprising. While previous studies on comparisons between the two SL styles are scant, research has shown that in many cases online students take more responsibility for learning course content on their own (Lewis, Whiteside & Dikkers, 2014). This may indicate that the delivery method of course material is less important than would otherwise be expected.

It was unexpected that there would be no relationship between reliance on online communication technologies and greater personal and professional growth. This may indicate that the traditional SL class used much of the same technology (i.e., email, Google Drive) as the E-SL class. It is also possible that video conferencing such as FaceTime and Zoom have gotten so ubiquitous as to be used as collaboration tools in both online and traditional classes.

LIMITATIONS AND FUTURE RESEARCH

This study has several strengths, mainly due to its design. Both the SL and the E-SL courses had the exact same settings including the instructor, curriculum, semester, course structure and duration, assessment methods, and types of SL conducted. In addition, the community partners were the same for both cohorts. This allowed for better comparison between the two sections and the student outcomes than previous research on this topic. It also removes the potential contamination of instructor capability or student fit with the mission of the community partner.

The main limitation of the research is that the data was collected from just two classes with 33 total students from a single university over the course of a single semester. Given the small sample size, caution should be used when making generalizations based only on these findings. Future research should be undertaken to expand this study to include multiple courses from across different business disciplines.

Another limitation is that this study involved type IV service E-SL, which is the most intensive and consists of fully online delivery of both course instruction and service delivery. Other types of E-SL could yield different results given the varying levels of interaction if either component was instead conducted in person.

As business educators work to increase student engagement and to enhance student development, the inclusion of service-learning experiences is likely to continue. These twin goals are even more challenging in the online setting which makes the understanding of E-SL even more vital. Further research could help provide a better understanding of how this important tool could be used to improve the online student learning experience.

REFERENCES

Ash, S. L., and Clayton, P. H. (2009). Generating, Deepening, and Documenting Learning: The Power of Critical Reflection in Applied Learning. *Journal of Applied Learning in Higher Education*. V. 1, No. 1, pp. 25-48.

Billing, S., and Furco, A. (2002). Service Learning Through a Multidisciplinary Lens: A Volume in Advances in Service-Learning Research.

Bringle, R. G., and Hatcher, J. A. (1999). Reflection in Service Learning: Making Meaning or Experience. *Educational Horizons.* 179-185.

Celio C. I., Durlak J., and Dymnicki A. (2011). A Meta-Analysis of the Impact of Service-Learning on Students. *Journal of Experiential Education*, V. 34, No. 2, pp. 164–181.

Conway J. M., Amel E. L., and Gerwien D. P. (2009). Teaching and Learning in the Social Context: A Meta-Analysis of Service Learning's Effects on Academic, Personal, Social, and Citizenship Outcomes. *Teaching of Psychology*. V. 36, No. 4, pp. 233–245.

Eyler, J., and Giles Jr, D. E. (1999). *Where's the Learning in Service-Learning? Jossey-Bass Higher and Adult Education Series*. Jossey-Bass, Inc., 350 Sansome St., San Francisco, CA 94104.

Falk, L. K., Rivera, R. E., and Smith, K. B. (2022). The Rise of the Online Faculty, Qualifications, and Workload Expectations. In *Competition Forum.* V. 20, No. 1/2, pp. 127-136.

Fullerton, A., Reitenauer, V. L., and Kerrigan, S. M. (2015). A Grateful Recollecting: A Qualitative Study of the Long-term Impact of Service-Learning on Graduates. *Journal of Higher Education Outreach and Engagement*. V. *19, No.* 2, pp. 65-92.

Geringer, S. D., Stratemeyer, A. W., Canton, A., and Rice, W. (2009). Assessing Service-learning Outcomes in a Principles of Marketing Course: A Team-based vs. Individual-based Approach. *Journal for Advancement of Marketing Education*. V. *14, No,* 1, pp. 1-12.

Guthrie, K. L., and McCracken, H. (2014). Reflection: The Importance of Making Meaning in E-Service-Learning Courses. *Journal of Computing in Higher Education*. V. *26*, pp. 238-252.

Hatcher, J. A., Bringle, R. G., and Muthiah, R. (2004). Designing Effective Reflection: What Matters to Service-Learning? *Michigan Journal of Community Service Learning.* V. 11, No. 1, pp. 38-46.

Kim, K. J. (2009). Motivational Challenges of Adult Learners in Self-Directed E-learning. *Journal of Interactive Learning Research.* V. 20, No. 3, pp. 317-335.

Kolb, D. A. (1984). Experiential Learning: Experience as the Source of Learning and Development. Upper Saddle River, NJ: Prentice Hall.

Lambright, K. T., and Lu, Y. (2009). What Impacts the *Learning* in Service Learning? An Examination of Project Structure and Student Characteristics. *Journal of Public Affairs Education*. V. *15, No.* 4, pp. 425–444.

Largent, E. (2009). *Contributing Factors to Meaningful Service-learning and Intention for Future Volunteerism: A Case Study at a Community Cllege*. The University of Oklahoma.

Lewis, S., Whiteside, A.L., and Dikkers, AG. (2014). Autonomy and Responsibility: Online Learning as a Solution for At-Risk High School Students. *International Journal of E-Learning & Distance Education*. V. 29, No. 1, pp. 1-11.

Lorenzo Moledo, M. D. M., Sáez-Gambín, D., Ferraces Otero, M. J., and Varela Portela, C. (2021, January). Reflection and Quality Assessment in Service-learning Projects. When, with Whom, and Why. In *Frontiers in Education*. V. 5, pp. 605-609).

Mabry, J. B. (1998). Pedagogical Variations in Service-Learning and Student Outcomes: How Time, Contact, and Reflection Matter. *Michigan Journal of Community Service Learning.* V. 5, No. 1, pp. 32-47.

Malvey, D. M., Hamby, E. F., and Fottler, M. D. (2006). E-Service Learning: A Pedagogic Innovation for Healthcare Management Education. *The Journal of Health Administration Education*. V. *23, No.* 2, pp. 181-198.

Marco-Gardoqui, M., Eizaguirre, A., and García-Feijoo, M. (2020). The Impact of Service-Learning Methodology on Business Schools' Students Worldwide: A Systematic Literature Review. *Plos one*. V. *15, No.* 12.

Marcus, V. B., Atan, N. A., Talib, R., Latif, A. A., and Yusof, S. M. (2019). Promoting Students' Generic Skills with the Integration of E-Service Learning Platform. *International Journal of Emerging Technologies in Learning (Online).* V. 14, No. 20, pp. 4.

Marcus V. B., Atan N. A., Yusof S., and Tahir L. (2020). A Systematic Review of E-Service Learning in Higher Education. *International Journal of Interactive Mobile Technology*. V. 14, No. 6, pp. 4–13.

Markus, G. B., Howard, J. P., and King, D. C. (1993). Integrating Community Service and Classroom Instruction Enhances Learning: Results from an Experiment. *Educational Evaluation and Policy Analysis*. V. *15, No.* 4, pp. 410-419.

McGorry S. Y. (2012). No Significant Difference in Service Learning Online. *Journal of Asynchronous Learning Networks*. V. 16, No. 4, pp. 45–54.

Moely, B. E., and Ilustre, V. (2014). The Impact of Service-Learning Course Characteristics on University Students' Learning Outcomes. *Michigan Journal of Community Service Learning*. V. *21, No.* 1, pp. 5-16.

Ngai, G., Chan, S. C., and Kwan, K. P. (2018). Challenge, Meaning and Preparation: Critical Success Factors Influencing Student Learning Outcomes from Service-Learning. *Journal of Higher Education Outreach and Engagement*, V. *22, No.* 4, pp. 55-80.

Ngai, G., Lau, K. H., and Kwan, K. P. (2024). A Large-Scale Study of Students' E-Service-Learning Experiences and Outcomes During the Pandemic. *Journal of Experiential Education*. V. *47, No.* 1, pp. 29-52.

Novak, J.M., Markey, V., and Allen, M. (2007). Evaluating Cognitive Outcomes of Service Learning in Higher Education: A Meta-Analysis. *Communication Research Reports*. V. 24, No. 2, pp. 149-157.
Plata, S., and Moredo, P. J. (2021). Student Evaluation of Fully Online Service-Learning on SDGs During the COVID-19 Pandemic. In *DLSU Research Congress*.
Prentice, M., and Robinson, G. (2010), Improving Student Learning Outcomes with Service Learning. *Higher Education*. p.148.
Salam, M., Iskandar, D. N. A., Ibrahim, D. H. A., and Farooq, M. S. (2019). Service Learning in Higher Education: A Systematic Literature Review. *Asia Pacific Education Review.* V. 20, No. 4, pp. 573–593.
Schmidt, M. E. (2024). Embracing E-Service Learning in the Age of COVID and Beyond. *Scholarship of Teaching and Learning in Psychology. V. 10, No.* 3, pp. 337-341.
Schwehm, J. S., Lasker-Scott, T., and Elufiede, O. (2017). A Comparison of Learning Outcomes for Adult Students in On-Site and Online Service-Learning. *Online Journal of Distance Learning Administration*. V. 20, No. 1.
Skinner, R. and Chapman, C. (1999). *Service-learning and Community Service in K-12 Public Schools*. National Center for Education Statistics.
Snell, R. S., and Lau, K. H. (2020). The Development of a Service-Learning Outcomes Measurement Scale (S-LOMS). *Metropolitan Universities*. V. 31, No. 1, pp. 44-77.
Waldner L., McGorry S., and Widener M. (2010). Extreme E-Service Learning (XE-SL): E-Service Learning in the 100% Online Course. *MERLOT Journal of Online Learning and Teaching*. V. 6, No.4, pp. 839–851.
Waldner L. S., Widener M. C., and McGorry S. Y. (2012). E-Service Learning: The Evolution of Service-Learning to Engage a Growing Online Student Population. *Journal of Higher Education Outreach and Engagement*. V. 16, No. 2, pp. 123–150.
Warren, J. L. (2012). Does Service-Learning Increase Student Learning? A Meta-Analysis. *Michigan Journal of Community Service Learning. V. 18, No.* 2, pp. 56-61.
Weber, J. E., and Weber, P. S. (2010). Service Learning: An Empirical Analysis of the Impact of Service Learning on Civic Mindedness. *Journal of Business, Society & Government*, V. *2, No.* 2.
Winston, F. (2015). Reflections Upon Community Engagement: Service-Learning and Its Effect on Political Participation after College. *Journal of Higher Education Outreach and Engagement.* V. 19, No. 1, pp. 79-103.
Wong, M. M. L., and Lau, K. H. (2022). The Effectiveness of E-Service-Learning on Student Developmental Outcomes During COVID-19: Comparison Against the Traditional Service-Learning. In *Proceedings of the Paper presented at 3rd World Conference on Education and Teaching, Budapest, Hungary.* pp. 6-8.
Wong, M. M. L., and Lau, K. H. (2024). E-Service-Learning is Equally Effective as Traditional Service-Learning in Enhancing Student Developmental Outcomes. *Interactive Learning Environments*. V. 32, No. 8, pp. 4443-4457.
Wurr, A. J., and Hamilton, C. H. (2012). Leadership Development in Service-Learning: An Exploratory Investigation. *Journal of Higher Education Outreach and Engagement. V. 16, No.* 2, pp. 213-240.
Yorio P. L., and Ye F. (2012). A Meta-Analysis on the Effects of Service-Learning on the Social, Personal, and Cognitive Outcomes of Learning. *Academy of Management Learning and Education*. V. 11, No. 1, pp. 9–27.
Yusof, A., Atan, N. A., Harun, J., and Doulatabadi, M. (2019, March). Developing Students Graduate Attributes in Service-Learning Project Through Online Platform. In *Proceedings of the International Conference on Industrial Engineering and Operations Management* (pp. 3524-3537).

Retha A. Price is an Associate Professor of Marketing at Mississippi College. She holds a D.B.A. and M.B. A. from Mississippi State University. Dr. Price has experience teaching a variety of courses in the Marketing program including Digital Marketing and Integrated Marketing Communications. Her current research interests are online learning, marketing curriculum development, and service learning. Her work has appeared in *Journal of Retailing, Journal of Marketing Channels, Innovative Marketing, Business Education Innovation Journal, Journal of Academic and Business Ethics, Journal of Leadership, Accountability and Ethics, and Academy of Educational Leadership Journal.*

Kevin P. Pauli is Professor of Management at Mississippi College. He holds a Ph.D. and MBA from the University of Nebraska - Lincoln. He has worked for many years on issues relating to ethics, learning, and technology. Current research interests include management, academic honesty, ethics, privacy, computer learning and usage, and computer monitoring. Professor Pauli's articles have appeared in *Business and Society, Business Education Innovation Journal, Journal of Educational Computing Research, Journal of Academic and Business Ethics, International Journal for Management & Information Systems, Review of Business Information Systems Journal, Journal of Leadership, Accountability and Ethics,* and *Business Journal for Entrepreneurs.*

Tammy Y. Arthur is Professor of Management at Mississippi College. She holds a Ph.D. from Mississippi State University and worked in IT Management at BellSouth. Professor Arthur's current research interests are entrepreneurship, ethical decision making, and technology-enhanced learning. Her work has appeared in the *Review of Business Information Systems Journal, Journal of Academic and Business Ethics, International Journal for Management & Information Systems, Business Education Innovation Journal, Journal of Leadership, Accountability and Ethics,* and *Business Journal for Entrepreneurs.*

Enhancing the Range of Service-Learning Opportunities in an Accounting Information System Course and Overcoming Professor Time Constraints

Robert O'Haver, Northeastern University (Boston, MA, USA)

ABSTRACT

Service learning ("SL") in accounting has largely focused on the VITA tax program. The extant research has found this mode of learning to be effective. Furthermore, SL is tied to some of the directions espoused in the profession to help stem the decline in accounting concentrators nationally**.** This paper is designed to fit this literature context by demonstrating a wider range of SL applications in upper-level accounting courses to increase the appeal of the SL modality. Additionally, this paper provides insights and suggestions to enable professors to be more impactful should they decide to integrate SL projects into their courses and to have some strategies to address the time constraint (i.e., limits on the professor's time to mentor projects) implied by existing research. Finally, this paper provides evidence of the learning impact of SL applications – based on the authors' experience in having SL projects as an option for students – to inspire others to consider this approach to teaching.

Key words: Service Learning, Experiential Learning, Accounting

INTRODUCTION

Service Learning (SL) is gaining prominence in higher education. Distinctly, SL is not just about volunteering; it ties the student's efforts directly to their classroom learning. Hence, there is an opportunity to leverage student learning through unstructured problem-based formats where both technical learning and soft skills can be developed while providing students an opportunity to "do good."

There are several trends in accounting education - and the accounting career field generally - that dovetail with SL initiatives. Perhaps the most notable trend is the impact of technology and automation on eliminating and/or changing traditional roles in accounting and finance. Due to this, there is an emphasis on the need for accountants and related professionals to provide a real value-added function to turn data and non-routine analysis into actionable insights. Hence, the ability to think and problem solve in an unstructured environment is increasingly important. The increasing role of the accountant as an advisor also places greater emphasis on students developing "soft" skills that are often intangible drivers of career success. Thus, SL is primed to be an effective learning approach yet the range of SL applications in the accounting curriculum has been limited, and only certain aspects researched.

This paper seeks to broaden the appeal and applicability of SL in accounting education. In this paper, the author shares his experience of integrating SL projects in an Accounting Information Systems (AIS) based course and provides lessons learned relative to overcoming certain constraints. One such constraint is the limit on the professor's time to mentor student project teams. The professor of the AIS course, a retired consulting partner at a Big Four accounting firm, pivoted to academia in 2010 and began teaching AIS at the undergraduate level in a large, private university.

LITERATURE REVIEW

Poston and Smith (2015) provide a salient overview of the historical development – both from trade association and academic research perspectives - of factors driving interest in SL as a pedagogical approach for accounting and finance students.

The AICPA (AICPA 2021) highlighted the importance of problem-solving, personal ethics, effective communication, and similar skills in its core competency framework. The Association to Advance Collegiate Schools of Business (AACSB213) articulates similar goals. There is significant literature – across many academic fields - validating the role that SL contributes to helping students develop a broader skill set as a complement to the traditional content often delivered through lecture formats. Additionally, there is a growing interest among employers in this expanded skill set (Clovey and Oladipo, 2008).

SL applications in accounting have been documented to increase the appeal to students in selecting accounting as a concentration (Edmonds and Driskill, 2019; Kahn and Haroon, 2002). Considering the widely reported national decline in students specializing in accounting, this is noteworthy. Kahn and Haroon (2002) state that "stressing the good that accountants do for society, would help alleviate the decline in the quality and quantity of accounting majors". Hurt (2010) suggests designing the entire undergraduate accounting core with an emphasis on fundamental skills - including SL as one of six focused modules - rather than pure technical content.

At the author's institution (from 2016-24) over thirteen thousand students took part in formal (class-based) service-learning programs offered by the university. Twenty-one percent of these students were from the college of business. The vast majority of these business students were marketing concentrators, with virtually no accounting concentrator participation outside of those in the VITA program (and the projects offered in the course that is the subject of this article.)

The Volunteer Income Tax Assistance (VITA) program is the primary SL opportunity for accounting students. In this nationwide program, students provide basic personal tax return preparation for low-income and senior citizens. Typical research findings – largely based on student survey responses - indicate that the VITA program enables real-life applications of classroom accounting instruction (Blanthorne and Westrin, 2016; Christensen and Woodland, 2016; Boneck, 2014) and enhances communication skills, and provides for a deeper understanding of taxation principles (Aldrige, Callahan, Chen, and Wade, 2015; Balden, Efrat, Plunkett, Jager, and Nolasco, 2011). Other researchers (e.g., Efrat and Plunkett, 2020) find similar outcomes and report significant increases in "volunteering attitudes", again based on student survey responses. An important characteristic of the VITA program is that clients are individuals (not organizations) and a local service organization (e.g., a branch library provides the meeting facilities and markets the program) facilitates the sourcing of clients. The tax services provided by the students are uniform and of a basic personal income tax level. Accordingly, the VITA program is practical to scale across an entire class of tax students or clubs (e.g., Beta Alpha Psi, the accounting student Honor society).

As noted in a very recent paper (Bootsma and Perkins, 2021), most of the SL research in accounting has depended on student survey responses – reflective in nature – to judge the efficacy of the SL applications within a course. The Lafond and Wentzel 2022 paper used a pre/post-test score framework involving control and treatment groups to find that the in-class SL case was effective in helping students understand core concepts (e.g., CVP analysis) and increasing awareness of their surrounding communities. Bootsma et al undertake a rigorous empirical test – based on outside observers scoring the students' client interactions - of how the VITA program impacts student development as to tax concepts and "calibration" (i.e., students' ability to "know what they don't know") when providing tax assistance. Based on the work of other researchers (Carr 1998), the Bootsma paper tests and generates results documenting increased effectiveness in students developing the following "soft" skill categories: communication, interpersonal skills, and personal abilities (e.g., decision-making, initiative, and attention to detail).

Given the well documented success of the SL-related VITA program it is curious why more SL programs in accounting have not emerged. Other than the VITA program there are few SL published research for upper-level accounting courses. There is a "classroom-based", SL-themed cost accounting application (Lafond, Leauby, and Wentzel, 2017; Lafond and Wentzel, 2022). The 2017 paper involved an in-class case for managerial accounting related to a local soup kitchen. Instead of direct client interaction, students watch a video about the soup kitchen and use author-provided data for their CVP analysis. This emphasis on a "classroom-based" method posits a wider question: considering the well-documented advantages of SL, why hasn't it been more extensively integrated into other advanced accounting courses?

The Lafond papers focusing on a classroom-based approach are motivated by an earlier paper (Chiang 2008). The Chaing paper involved students undertaking performance improvement type analysis for various local community service organizations. This effort involved actual student contact with the organizations. Chiang found that this type of SL offering required a fair amount of professor time to coordinate interactions between student teams and the receiving organizations. It is therefore reasoned in the Lafond paper that this extra burden may make SL less attractive to faculty to integrate SL as part of their courses.

Additional papers in the accounting field describe efforts and lessons learned in designing SL experiences, again largely around the VITA program. Except for a few papers, the research is also limited relative to understanding the SL benefits from the client's perspective (either in a general or counterfactual sense). Nor are there many papers exploring delivering the SL experience in a team-based format or providing more specific insights into how to tie an SL project element to the learning content of the associated course.

This paper is designed to fit this literature context by demonstrating a wider range of SL applications in an upper-level accounting course. Additionally, this paper provides insights and suggestions to enable professors to be more impactful should they decide to integrate SL projects into their courses and to have some strategies for the time constraint implied by the Chiang and Lafond papers. Finally, this paper provides some evidence of the learning impact of SL applications – based on the authors' experience in having SL projects as an option for students – to inspire others to consider this approach to teaching.

As such, the following inquiry questions are motivated.

INQUIRY QUESTIONS

Inquiry 1: the experience of SL in accounting has been limited, is there an opportunity for a wider set of applications in upper-level accounting courses?

Inquiry 2: instructor constraints are real, are there ways to more efficiently increase the scale of the SL educational opportunity for a greater number of students given limits on instructor time?

Inquiry 3: how important is actual community (student/client) engagement relative to the AICPA and AACSB articulated skill sets relative to SL opportunities? What other – or more specific - soft skills (akin to the Bootsma focus on "calibration") can be developed in an SL format?

Inquiry 4: are there additional ways to measure student and client impacts from SL projects and are client impacts important to students?

Inquiry 5: What are some important lessons learned and what future directions might research take on this topic in the accounting education field?

Inquiry 1: Thinking expansively of SL accounting opportunities

Appendix Exhibit 1 profiles the SL applications that the professor of the course has undertaken as part of an Accounting Information Systems (AIS) course over the past ten years. Upon inspection, there is a wide range of community non-profit **client organizations** – e.g., land trusts, community health, local library systems, food rescue - offering up interesting and suitable SL project opportunities. While the focus of this article is on AIS, many of these projects would fit equally well with audit, data analytics, and upper-level management accounting (e.g., impact analysis). Further, there is a large range of potential skill-based applications that can be undertaken by the typically two to four-person student teams. In the context of an Accounting Information Systems (AIS) course these applications include system and relational database platform development, impact analysis, process flowchart analysis, risk and controls analysis, choice of financial reporting platforms for different types of organizations, data analytics, and pricing/revenue model analysis.

While not a focus of this paper many universities have student clubs offering financial literacy training to local community members (e.g., high school students). This represents another opportunity, though one that may be constrained by a lack of a strong tie to specific course offerings. With financial literacy, one can interpret that topic broadly. For example, one of the projects in the course's SL portfolio involved a student team constructing knowledge objects around the basics of financial reporting on QuickBooks – i.e., financial reporting platform selection being a direct tie to the AIS course content - for the local veteran's chamber of commerce (a nation-wide group with regional branches). Another opportunity at some universities is fashioning SL projects around student incubators of new businesses (i.e., start-ups). This provides peer-to-peer learning experiences and a specific example is discussed further below.

Drawing from the diverse service-learning applications within AIS, there's undeniable potential for broadening engagement in related fields, from audit to data analytics. Such multifaceted opportunities underscore the profound impact of integrating hands-on community projects into academic curriculums.

Inquiry 2: Scaling Student Learning Without Overburdening Professors

As noted, research (Lafond 2022) postulates that the limited use of SL formats in accounting classes is due to the time burden placed on professors. This is a legitimate concern.

One lesson learned on the QuickBooks project was the involvement (on a volunteer basis) of a local accounting practitioner (a university alumni) from a regional accounting firm. This significantly reduced the time commitment for the professor from a student mentoring perspective. Hence, this is one strategy that can be taken as would the involvement of a teaching or research assistant in this role as alumni are often interested in this type of real involvement with students.

In addition to involving outside practitioners, three additional approaches have been useful - in the authors' experience - in overcoming the time constraint. The first is to structure the course so there are class presentations by the SL student teams to the entire class each semester. In addition to trading off lecture time for project mentoring time, this

enables the SL project teams to present their work in some detail to a class of thirty-four other students. Based on the author's experience in teaching AIS courses, it is advisable to provide students with a list of potential project topics and then let them self-select a topic that is truly of interest. At the end of the semester, each team makes a class presentation. Appendix Exhibit 2 provides an example of the range of project choices (both traditional and SL-focused) from a recent AIS class. A testament to the success of SL is that when given a choice of roughly ten topics each semester, students consistently selected the one or two available SL projects. By offering only a few SL projects each term and presenting them to the entire class, the professor minimizes their workload while maximizing the learning impact for all students.

The second approach is to continue an SL project (for the same client) across semesters and different student teams. This mimics the work often found in professional accounting where annuity-type projects are rotated to new teams every few years (i.e., same client but with a new service provider team). This rotation happens in audit engagements at accounting firms, for example. As such, it reinforces the importance of properly documenting one's work relative to a "hand-off" – a crucial skill in accounting around annuity-type clients. This also reduces some of the time constraints on the professor as onboarding and vetting a new client is avoided.

The third is to use past projects in the current semester's teaching plan to benefit the entire class. As such, this is a good way to scale the educational content of many past SL engagements to a larger set of students. This is done during a lecture, targeted to the specific parts of the course. Exhibit 1 provides examples of how some of the projects referenced in Appendix 1 were "slotted" via twenty-minute segments into an Accounting Information Systems course in otherwise standard course content. Table 1 (Appendix 1 provides greater detail on these projects) again emphasizes that SL experiences need to be tied to concepts taught in the classroom Rama (1998). A particularly nice feature of this approach is that certain artifacts from the previous projects (e.g., the PowerPoint deck or a video recording used to present to the client) can be made available through the course learning management system. Experiencing a group presentation on a subject can ignite intellectual curiosity thereby prompting students to explore the topic more deeply. Additionally, current students often feel empowered when they see the accomplishments of students from previous semesters in the same course. These are factors that may serve to increase the attraction of SL applications to accounting professors.

Another important lesson learned relative to the professor's time constraint is finding an efficient way to source potential non-profit clients. Relative to sourcing, many colleges and universities have extensive community outreach (often revolving around student volunteer opportunities) and this network can be an efficient source of opportunities. Additionally, many universities have student start-up incubators and there can be many accounting research-related opportunities present in this realm. In the authors' experience, start-ups need accounting insights as to the choice of "best" corporate form, financial reporting platforms, risk and controls, and forecasting pro forma financial statements given the hoped-for progress of start-ups scaling quickly through the "relevant range" of operations thereby having to plan for changing cost structures. Some university student incubators provide prototype funding so additional managerial accounting analyses around demand forecasting and break-even analysis. Further, universities in larger metropolitan areas may have organizations such as Volunteer Lawyers for the Arts or the Arts and Business Council providing another potential source of project opportunity. Developing these channels requires an upfront investment of time but can greatly facilitate the pipeline of projects across semesters.

Another effective way to mitigate the time burden on professors is appointing student mentors. These mentors need not be subject matter experts, but someone who can provide valuable guidance. These mentors are typically past students who have taken the course, or even students who have not taken the course but have had some internship or work experience related to the assignment. Engaging student mentors broadens the learning circle, allowing students to gain varied insights. This structure enables professors to delve deeper into topics, knowing there's additional support. Mentors also gain as teaching helps reinforce their understanding. Plus, with their involvement, assignments can be more comprehensive and beneficial. However, this approach isn't without challenges. Matching the right mentor with the right project can be a puzzle. Given the voluntary nature of the role, maintaining mentor engagement might be challenging, especially if they've moved past the course stage. Also, the level of guidance might differ from one mentor to another, causing variability in student experiences. Striking the right balance between mentor involvement and monitoring the entire setup for effectiveness is crucial.

Table 1: Examples of weaving SL mini cases into a traditional AIS lecture format

Traditional AIS Content Module	SL Project (App Ex 1)	Uniqueness factor supplementing the lecture
Business Process Mapping	Clinicia Esperanza: Document flowcharts to design a data base (Microsoft Access) build	• Revisions, revisions, revisions… • Use of current v future state flowcharts to depict implementation process • Illustrates proper documentation
Relational database design	Person to Person database (Airtable) build	• Bringing the AIS mantra of People/Process/Technology to life through design thinking
Data Visualization	Boston Library: system digital database build (Tableau)	• Integrating toggle switches (design thinking) to enable branch program performance to be viewed in relation to local branch demographics
Emerging tech use cases	Land Trust: environmental audit	• Illustrating a use case for drones
Risk & Controls	Boston Tennis Club: Risk & controls analysis	• How to apply the COSO framework for a non-profit
Big Data	Coastal town: Est. property tax loss due to climate change	• Integrating climate forecasts, phyton coding to "scrape" local tax records and discounted cash flow methodologies

Finally, proper vetting of the organization is needed to ensure both the data and the availability of client personnel are present to allow for meaningful analysis and student-client interactions and that the organization's needs fit with the contours of the associated course. Additionally, establishing a common set of expectations is important. Again, time invested upfront can save an appreciable amount of professor time over the project. Particularly important is determining how the student team can best interact with the client. Many of the "soft" skills are developed in these client experiences (e.g., having the student team describe the planned approach and project deliverables, timing, data requests followed by presentations of their finding). This process can provide students with meaningful (client-centered) project management experience beyond that team experience that may have taken place in an introductory accounting class case assignment. Further, the "client experience" is not replicated in the pure classroom-based SL approach nor achieved through intern-type experiences.

Inquiry 3: Relevant skill development opportunities addressed by SL in accounting education

Bootsma (referencing Carr) details the soft skills evidenced as part of their SL research efforts. These skill sets fell into three categories: communication skills, interpersonal skills, and personal abilities. Their research framework is useful but can be further detailed – in the authors' experience - into more specific types of soft skills. For example, skills such as managing client expectations, design thinking, quality control, proper documentation of work product, thinking through how the client will use the analysis in an ongoing manner, and what the client's capacity is implement the findings are all illustrative of a deeper set of skills that SL opportunities involve. These are skills that professional firms are looking for in their new hires.

Perhaps a unique feature of SL projects from the student's perspective is that these types of projects also provide a unique and interesting discussion topic in job interviews and/or in their LinkedIn profiles. Greater specificity as to

these soft skills also adds more heft to the motivations behind the AICPA and AASCB recommendations relative to the importance of these attributes.

Inquiry 4: Assessing Student and Community Impact from SL Projects

While most of the literature focuses on measuring student outcomes from reflection-type surveys, actual client/community impacts are important for at least two reasons. First, if there is an actual impact this can make a meaningful difference for the student (both in recall and the ability to document real-world experience) and it may be useful to the university for community engagement purposes. Research (Driscoll, Holland, Gelmon and Kerrigan, 2017) indicates that universities reap direct benefits from SL-based community engagement.

Integrating technology, especially in fields like AIS, ameliorates the impact of SL endeavors. For example, let's consider a project where students work on a pricing strategy for a non-profit. Instead of merely doing theoretical analysis on the project, they build a practical application such as a flexible pricing model for the client using tools like Excel macros. Thus, the students can help the non-profit to modify their pricing strategy over time, without the need for external support. The principle here is to create projects that allow students to build tools that yield enduring benefits, and not merely a one-off analysis. In general, most scalable solutions inevitably will require technology. As students undertake the mission of producing a technology-centric solution, their academic journey becomes more immersive. Not only are the students bolstering their understanding of the core subject matter, but they're also navigating real-life constraints to find an optimal solution. However, it's vital to ensure that this technological addition complements, rather than dominates, the fundamental spirit of the course. The goal is to marry practical application with concepts of the course without drifting from the learning objectives.

Appendix 2A showcases sample student reflections from the professor's SL portfolio on their project experiences. Further highlighting a point from Inquiry 2, Appendix 2B demonstrates how the impact of SL projects isn't confined to the team members but also resonates with other students attending the SL team's presentation. This is exemplified through a data analytics project executed for the JED Foundation, a prominent organization for college campus mental health awareness, and includes reactions from a student who attended the presentation and a response from one of the presenting team members.

Appendix 3 provides brief reflections from the executive directors at the "client" non-profits benefitting from the work of the assigned student team. It is worth noting that a number of these clients have asked for similar engagements with new teams in subsequent semesters and this can be taken as a further indication of the efficacy of SL efforts. Block and Perkins (2019) is one of the few papers that evaluates client impact. The authors of the paper researched thirty international service-learning (graduate) projects with a focus on direct and indirect client (or "partner") value generated.

Reflecting on the need for efficacy assessments beyond student reflections and surveys. There are other indicators that can be relied upon. Table 2 provides a tally for each of the SL projects in Appendix 1 the number of repeat projects for the same client. "Repeat business" is always an objective indicator of value provided. Additionally, a tally is provided for each client detailing the number of students who either a) went above the project's requirements, motivated by an intrinsic desire to exceed client expectations, or b) volunteered in a subsequent semester either to continue working with the client or mentor another student team on a related project. These actions act as tangible "revealed preference" indicators, reflecting the perceived value students gain from the SL experience providing insights beyond survey/reflection results. Notably, multiple projects have been recognized with conference awards by an independent academic panel, further emphasizing the significance of SL in accounting education from an educator's perspective.

Inquiry 5: Additional Learnings and Prospects for Upcoming Research

In addition to some of the lessons learned previously expressed, additional lessons from the authors' experience include:

- Local, non-profit organizations make very suitable candidate organizations for SL because they are often of a scale where students can quickly grasp the big picture of the organization and how their specific project fits into that mission. Also, the gratitude expressed by these organizations – to get something they need but do not have the funds or time or fresh insights/expertise to tackle themselves – further enhances the student learning experience as both positive reinforcement and that something of real value was delivered in a counterfactual sense. This may further enhance the ability of the student to recall the learning attributes of the project years later. Additionally, these organizations can offer distinctive and nuanced ethical insights.

A notable instance is a food rescue (pantry) project where students designed a system on the Airtable platform, enabling impoverished clients to indicate their food preferences and allergy restrictions. Through this endeavor, the student team grasped that granting individuals the ability to voice their preferences, even in dire circumstances, embodies a sense of dignity. Their work on the Airtable platform effectively facilitated this realization.

- The role of the professor is to serve as a mentor to the student team as needed. The student team leads the client interactions, sets the project work plan, and relies on the professor for direction only when they get stuck. This is effectively a good way to build the "calibration" skill discussed in Bootsma.
- Having a "real" client experience where the students are leading the client discussion is important to students, a fact often expressed by students in end-of-semester surveys. Even on "good" internships, if the student is fortunate enough to be invited to the client meeting then typically their role is that of a passive observer. Therefore, the opportunity to engage and think on one's feet is not developed.
- The impact of having these projects brought into the classroom through live presentations and/or having the professor take and integrate a past project to illustrate a lecture-based concept is very important because students can be empowered to observe relevance and what their peers in the same class were able to accomplish. Additionally, most business curricula do not provide opportunities for students to learn about the non-profit sector.
- As noted, properly vetting the client is important. Block's (2019) findings that partner readiness, project design, and project execution are necessary conditions for the project to provide "direct" value cannot be over-emphasized.
- Ensuring that student teams recognize from the outset that the project has a relatively open-ended structure fosters the development and application of genuine project management skills. Engaging with a real client and meeting their specific expectations reinforces the significance of mastering project management objectives.
- It's crucial to set realistic expectations with the client regarding the project's scope achievable within a semester. Ensuring a balanced workload across all project teams and employing a consistent grading rubric for all group project types is essential for maintaining fairness. Furthermore, SL projects pave the way for comprehensive feedback, sourced both from the professor and directly from the client.
- Looking ahead to future considerations and research avenues, a pressing need—and indeed a challenge—is to dissect the unique facets of SL. Specifically, what knowledge and skills do students gain from SL that they might not acquire from other collegiate learning modalities, such as executive boards on clubs, classroom instruction, study abroad programs, or other experiential opportunities inherent to a campus setting? While student perceptions of the SL experience hold value, there's a clear advantage in developing more detailed survey tools that span various SL projects, particularly focusing on the specific attributes outlined in Table 2. Lastly, it is particularly challenging to test in a pre/post treatment versus control group setting the incremental concept/content learning when students have access to the same lectures, textbooks, and other supplemental resources. However, to the extent that group project choices are specifically tied to parts of a semester-long course, it may be possible to test for exam score differentials should similar group project topics be used over multiple semesters.
- A repository of shared "sanitized" student project deliverables would be a good learning resource should a larger cohort of accounting faculty develop this interest. Samples are readily available from the authors relative to the list of past projects.

Table 2: SL Project Summary of student Engagement Levels

Client (1)	# Proj teams (2)	# Students (3)	# Students who "went beyond" (4)	# Students who volunteered to continue involvement or peer to peer mentor the following semester (5)
Land trust	3	7	4 [a1]	2
Flower Again	1	3		-
Salt Ponds Coalition	1	1	1	-
Westerly -RI Economic Dev. Comm.	1	2	1[b]	-
JED Foundation	1	3	-	-
Food Rescue	4	6	1[c]	2
Boston Library	1	3	1	1
NE Veterans	1	2	1	1
Faculty Senate	1	1	1	1
Everyday Boston	1	1	-	1
Good Impact Network	1	2	-	-
Clinica Esperanza	1	2	1	1
She Gives	1	2	1	-
Totals	**18**	**35**	**12**	**9**

Examples of student teams "going beyond"

a. While the project called for mapping the size of various environmental assets (trees and marsh grass) the team went beyond to also convert these physical measures into dollar estimates. (e.g., $ value of a ton of carbon extraction)

b. Student team extended the original project focus on seal level rise to also include 100-year coastal storms.
c. Development of an app in addition to the database and queries.

CONCLUSIONS

SL offers a real opportunity to accounting educators, particularly important given trends in automation and students self-selecting into accounting concentrations. SL projects enable instructors to interweave and emphasize the importance of unstructured and problem-based learning and soft skill development. Further, there are proven strategies to overcome the time constraints if they travel this path. Finally, a much more meaningful level of engagement can be developed with SL students between students and faculty. This is evidenced in the ability of professors to draft much more impactful student references and application letters. In addition, recommendation letters for students involved in SL projects, compared to traditional case-based projects, provide a unique and detailed portrayal that can set them apart.

While incorporating SL modalities into accounting instruction might initially demand a higher investment of time and resources, the authors contend that the enriched learning experience, deeper student engagement, and real-world application make the trade-off invaluable. The tangible benefits and long-term impact on students' understanding and skill sets are well worth the initial effort and time investment.

REFERENCES

The Association of International Certified Public Accountants (2018) The AICPA Pre-certification core competency framework.

The Association to Advance Collegiate Schools of Business (AASCB) (2013). AACSB 2013 eligibility procedures and accreditation standards for business accreditation.

Aldrige, R., Callahan, R.A. Chen, Y. Wade, S.R. (2015*). Income tax preparation assistance service-learning program: A multidimensional assessment.* Journal of Education for Business. 90(6).

Balden, J.M., Efrat, R., Plunkett, S.W., Jager, S.L., Nolasco, H.M. (2018*). An evaluation of a university based pro bono tax service program for low-income taxpayers.* Tax Development Journal, 8.

Blanthorne, C. Westin, S. (2016). *A comprehensive review of the literature and an analysis of the program in accounting* . Issues in Accounting Education, 31(1).

Block, E., Bartkus, V.O. *Learning to Service: Delivering Partner Value Through Service-Learning Projects. Academy of Management Learning and Education*, 18(3).

Boneck, R. Barnes, J.N., Stillman, T.F. (2014). *VITA experiential service-learning , learned competencies, and changes mindsets*. Journal of College Teaching & Learning. 11(2).

Bootsma, B. Jeffrey, C., Perkins, J. (2021) *Measuring the Extent to which Vita participation improves student technical competence and soft skills*. Issues in Accounting Education, 36(2).

Carr, J. (1998). Service-learning in Accounting: A role for VITA programs in D.V. Rama (ed.) Learning by doing: Concepts and models for service-learning in accounting (pp 101-116). Washington, D.C. American Association for Higher Education.

Chiang, B. (2008). *Integrating a service-learning project in a managerial accounting coursework – sharing of implementation and lessons learned*. Accounting Education, 17(4).

Christensen, A.I., Woodland, A. (2016*) Is participation in the Volunteer Income Tax Assistance (VITA) program associated with students problem-solving skills and professional commitment?* Issues in Accounting Education, 31.

Clovey, R., Oladipo, O. *The VITA Program: a catalyst for improving accounting education (*2008) The CPA Journal. 78(12).

Driskill, E. (2019). *Gen Z: Exploring service-learning projects in managerial accounting*. Journal of Accounting and Finance. 19(4).

Driscoll, A, Holland, B, Gelmon, S, Kerrigan, S. *An Assessment Model of Service Learning Case Studies Impacts on Faculty, Students, Community and Institutions.* Michigan Journal of Community Service Learning. 1996

Efrat, R., Plunkett S. W. (2020). *Evaluating the impact of the Vita Program on attitudes and motives regarding volunteering and civic engagement.* Advances in Accounting Education, Teaching and Curriculum Innovations, 24.

Hurt, B. (2007) *Teaching What Matters: A New Conception of Accounting Education*. Journal of Education for Businesses. 82(5).

Lafond, C.A., Leauby, B.A., Wentzel, K(2017). *Lessons in managerial accounting from a service-learning project at a local soup kitchen.* Global Perspectives on Accounting Education, 14.

Lafond, C.A., Wentzel, K. (2022). *Emerging* Service Learning and entrepreneurial thinking: PB&J sandwiches in a managerial accounting class, Journal of Accounting Education. 60c.

Khan, Z., Haroon, M.M. (2002). *Academic service-learning in an accounting information systems capstone course.* The Review of Business Information Systems, 6(4).

Poston, K. M., Smith, R.A. (2015) *An Interdisciplinary Service-learning Course for Undergraduate Finance and Accounting Students: The VITA Program Expanded*. Journal of Financial Education, 41(1)

Rama, D.V. (1998) Learning by doing: Concepts and models for service-learning in accounting. Sterling, VA: Stylus.

Author bio: **Robert O'Haver, PhD** is a senior teaching professor at the business school at the D'Amore-McKim School of Business, Northeastern University.

Appendix 1: Portfolio of Projects

Land Trusts

- Drone mapping of a feature property to audit, and value, the environmental assets (e.g., tree canopies as a carbon sink, marsh grasses as a nitrogen sink, and habitat attributes of a 20-acre property) to help enable the subject land trust to articulate the value of conservation.
- Design and implementation of an app/relational database (Air Table) to improve the reporting/auditing process of the annual volunteer property evaluation process.
- Documentation of the internal controls around donations, segregated funds, and the presence of Separation of Duty controls.

Natural Resources

- Estimated the economic value of six large coastal ponds in Rhode Island, with a regression model focus on house value premiums for pond access/proximity.

Climate Change/Property Tax Impacts

- Big Data project involving data visualization, Python coding, and other data analytic skills to assist the town in estimating the future impact on property tax revenue streams from climate change (sea level rise and increased frequency/intensity of severe coastal storms).

Food Rescue

- Developed and tested a data methodology to allow a large food pantry to more reasonably estimate the number of unique "clients" touched by their food rescue operations, helping to facilitate grant-making needs.
- Developed a digital platform (Airtable) for low- income clients to express food category preferences and constraints (e.g., allergies) relative to certain non-profit pantry sites shifting from an in-person "shopping" experience to a "grab and go" model.
- Analysis of the multi-dimensional impacts of Food Rescue (Community Plates) as an organizational model to aid in the national expansion of the organization.
- Audit of the client's existing methodology relative to estimates of pounds rescued to reveal a systematic overestimate.

Mental Health (JED Foundation)/Data Analytics

- Data analytics (hypothesis testing, ANOVA, and regression) to help enable the foundation to assess - for a variety of outcomes (e.g., campus counseling center visits) - the impact of various independent variables (large versus small, urban versus rural) associated with different colleges and universities.

- Public Library/Data Analytics

- Multidimensional impact measurement for feature programs (e.g., English as a Second Language) across the branch network of the Boston Public Library.
- Development of a digital dashboard to monitor specific branch program performance given local demographic characteristics in micro-census areas.

Financial/Impact metric reporting platforms

- Construction of a digital knowledge object (video to help train veterans on financial reporting features of QuickBooks) on behalf of the New England Veteran's Chamber of Commerce to help veterans launch new businesses
- Design and build a digital dashboard (Tableau) to benefit the Strategic Advisory Committee of the Faculty Senate at a large university. Dashboard design encompasses **Inputs** (e.g., faculty college representations by standing committee), **Outputs** (e.g., relative rates of "charges" turning into approved "resolutions" and **Outcomes** (i.e., do enacted resolutions lead to significant change).
- -Multiple projects on pro forma financial projections, tax analysis, financial reporting platforms, and internal controls for a variety of student start-up ventures at Northeastern University

Revenue Model and Pricing Studies

- Developed a digital revenue model to help the organization structure value propositions non-profits in the San Francisco area needing corporate volunteerism and the corporations themselves.
- Developed a pricing model and Excel template to enable the executive director optimize pricing on storytelling projects aimed at the corporate sector in the wake of the Black Lives Matter movement.

Community Health care and other system design and build

- Complete build-out (process flowcharting, Microsoft Access relational database and extensive forms/reports with associated controls) to digitalize a manual community nursing/education process for the Latino community in East Providence, RI.
- -Developed a ratio-based model to enable the membership of a Boston giving circle to better evaluate the financial and operational capacities of grantees.
- Student project to process map the collection/repurposing/delivery process of a nonprofit – Flower Again - recovering high-quality flowers from weddings and corporate events for distribution to senior centers and low-income housing. Process maps led to the design and creation (AirTable and Arc GIS) of a digital platform to improve the efficiency and scale possibilities of the organization.

Appendix 2A: Recent Student testimonials involved in SL projects

I have officially accepted a full-time position as a Strategy Analyst for Deloitte in NYC! I just wanted to thank you for all the help and support over the past year or two. AIS was a very influential course for me, but more importantly, I had a lot of passion for the projects I worked on. I hope to stay in touch!

I felt that our JED Foundation presentation was a good attempt and synthesizing a large amount of complex information thus making it palatable for an audience unfamiliar with the topic.

With the semester wrapping up and our project with Flower Again finished I wanted to thank you for a fantastic class. I've genuinely never been so interested and integrated in a class before, and it has spurred on a whole new career path for me as I now want to go into some sort of supply chain consulting rather than a traditional supply chain role. This project has easily been the most memorable project I've worked on,

Whenever I tell friends about what I'm doing they all think it's an awesome project

I would be more than happy to help as an informal advisor for new project. The Food Rescue project was one of the highlights of my year and I would love to have the opportunity to work with you again on a similar project

The SL experience allowed me to start from nothing and build a product in conjunction with a client. I had the opportunity to work with the client in order to determine what the narrative was, because it was not given. In class we were usually already given the completed diagram and we had to interpret it, but it was beneficial to see how to work with a narrative to create one. Similarly, creating a BPMN with a narrative that was gaining more detail as the mapping progressed was an experience that would difficult to replicate in a class.

I am glad to hear the course and the unstructured projects are going strong! It was definitely one of my favorites, and it is fantastic that it has evolved into a non-CPA concentration

Glad to hear the project went well! It was definitely one of my favorites I did at Northeastern

Appendix 2B: Examples of a survey question response from a student listening to one of the SL presentations (JED Foundation team) and the reaction of a member of that team

Survey question to the entire class: *Other than the topic that you were involved in presenting to the class…what other topic really stood out as being interesting and a good application of some of the themes in the class?*

Sample student response: The JED Foundation team was very influential and important to me. As we all know, Covid 19 has sparked mental health troubles across the globe, especially in college students. and I was extremely impressed by the data and solutions they gave, as well as the way they presented. Presenting on mental health can be depressing and sad, but they had a great balance between their arguments and positivity. This class prepares students to creatively think to solve problems. Although the JED team did not have much accounting or audit work, they creatively solved a problem much bigger than most accounting issues.

JED team member reaction to the above student response: *What a thrill! Until now I hadn't thought about the impact our presentation might have on our colleagues, but if at least one of them has felt this way, I think it's the best possible reward! Thanks for letting us know*

Appendix 3: Client testimonials

Thank you so much for another successful project completion for WFC**! Executive Director, Weekapaug Foundation for Conservation**

I just want to let you know that I am reading and digesting your report. There is a lot there and I think it is great. When will your next crop of students pick this project up again? I'm glad to meet anytime. **Chief Scientist, Salt Ponds Coalition**

The client preference project your students complete for us was such a great help. Thank you again! We ended up taking the content and instead of using Air Table, inserting into a Formsite form, which is the program we use that interfaces with Salesforce. At first we didn't think it would work, but our Stamford Food Manager was able to use all the work your students did to get it up and running.
I'd love to work with you on a future project if one arises... please keep in touch! And thank you again**! Chief Executive Officer Person-to-Person** Over 50 Years of Transforming Lives

It might have happened eventually, but you definitely shed light on and sped up the process. We are very lucky to have had the attention of your students on this. **New Volunteer Coordinator Food Rescue US**

Thank you for your comprehensive data analysis and thoughtful presentation of results. Your analyses and prepared approaches will be incredibly helpful to us as we collect more data over time. Your findings were actionable for recruitment and "selling" JED Campus to new schools, by helping us understand where we are best suited to make an impact with schools. I appreciate your technical expertise as well as ability to explain the analytics in a relatable way. Thank you for choosing us as your project for the semester and we're happy to hear that it was a good learning experience for you as well! **Director Learning and Evaluation, The JED Foundation**

Bottom line, the overall data analysis was spot on, logical, thorough, and detailed. The depiction of the work performed was well articulated, as was the rationale. The presentation of the information was solid, but the flow could have been more user friendly. Overall a well-executed project and good presentation at the University level. **Leader, Westerly Economic Development Commission**

We have partnered in the past on mostly analytics related projects that a professor runs with his students. They have done a really great job**. Chief Technology Officer, Boston Public Library**

Good evening, thank you, this is right on target. Ed is easy to follow, and your students' questions were on target. I especially like how user friendly they made QuickBooks look so easy to use and explained why people it's important to know information in the financial statements. I love the challenge questions, they were perfect, I never thought about "who is my biggest customer", and looking at the profit/loss report. I forwarded the link to my

board for their review and to a couple of my veteran businesses for their input. In my opinion this exceeded my expectation! Thank you so much! **Executive Director, NE Veterans Chamber of Commerce**

Wanted to say thank you so much again for your generosity with your time and expertise. I really appreciate all of your insight and guidance and will put it to good use**! CEO & Founder Good Impact Network**

Thank you so much! It was a really good meeting; they were energized by what you and Sidd put together. It's going to be very helpful as we move into a strategic retreat at the end of this month**. Executive Director Everyday Boston**

This will really be impactful as it will improve accuracy and reduce cycle time …basically, it will enable the nurses to devote more time to providing patient care rather than manual reporting and will improve the tie between patient reporting cycles and the financial systems of the clinic**. COO, Clinica Esperanza**

We've been using the data collection process that Angela and Robert built for us to great success! Currently we are at the point where we have reached out to a number of area nonprofits to fill in our online surveys. We've had good feedback so far on the ease of use & the data has been easy for us to view using the SharePoint site. **Controller, She Gives community giving circle**

A Tax Ethics Case Regarding Client Confidentiality

Dean Crawford, SUNY Oswego, Oswego NY, USA
Diana Franz, University of Toledo, Toledo OH, USA

ABSTRACT

The need for tax professionals to maintain the confidentiality of their client's information is well known. This case places students in a unique situation where the duty of the tax professionals may be to disclose their client's information. In essence, the firm's duty to maintain confidentiality and its duty to act in the public interest are in conflict. The case also illustrates the impact that state law can have on professional obligations. Please email Professor Crawford at dean.crawford@oswego.edu for the tax forms needed for the case.

Keywords: tax preparer responsibilities, professional ethics, client confidentiality, public interest

STARINGBRIDGE ASSOCIATES, LLP

In May 2024, John H. CPA stood at the office door of Jennifer M. CPA, a tax partner at Staringbridge Associates, LLP, the Minneapolis accounting firm where he worked. She looked up, and they had the following conversation.

"John, what's up?"

"Do you remember Roger Pentlebraugh?"

"He was a client of ours. Bit of a sleaze. Didn't we dump that guy?"

"Technically, he dumped us."

"Either way, good riddance. So why are we talking about him now?"

"He's running for Congress."

"Ugh! Remind me to vote for the other guy."

"Actually, he moved. He's running a couple of districts away from us. The trouble is, he's released copies of his tax returns for the last five years. That includes three that we did and two earlier ones that are not ours."

"And…?" Jennifer's eyes narrowed in anticipation of bad news to come.

"And so, I looked at the returns that he published and compared them to the ones in our files. Several items have been altered on the published returns. Overall, it looks like the published returns have been scrubbed of anything that might be politically damaging. The amounts shown for adjusted gross income, taxable income, and income tax match what we have in our files, but the details are very different. The two earlier returns also look like they've been cleaned up, but I don't have the original returns to compare them to."

"Didn't we file his returns electronically?"

"Yes, and I double-checked that the returns were accepted by the IRS. So, if he really did want to change a return, he should have filed an amended return on form 1040-X, not another 1040."

"Does our firm name appear anywhere on the published returns?"

"Fortunately, no. The preparer information has been redacted."

"Did he mention our name at all?"

"I haven't seen the press release. But I did see him on a local news show last Sunday. He was talking about his returns, and he also mentioned our firm's name. But I'm not sure if he linked our name to a specific return."

"Get me a copy of the press release. And get a transcript from that Sunday show."

TEACHING NOTE

Importance of Case and Student Audience

In 2024, two significant changes occurred that impact tax educators. One of those changes is that the American Institute of Certified Public Accountants (AICPA) updated its Statements on Standards for Tax Services (SSTS), which applies to all Certified Public Accountants (CPAs) who provide tax services. This case has students apply the rules of the SSTS and the AICPA Code of Professional Conduct to an ethical dilemma faced by a CPA firm.

The other change is that the new CPA exam format and content took effect. The CPA exam now has three core sections that all candidates are required to take (AICPA 2023). One of those sections is Tax and Compliance Planning (TCP). The CPA exam blueprint indicates that ten to twenty percent of that exam relates to ethics, professional responsibilities, and federal tax procedures. Purcell and Anders (2024) provide an overview of these changes and resources for faculty.

This case will assist tax educators with addressing both of those changes. The case has students access the SSTSs and the AICPA Code of Professional Conduct and describes a situation where there is a conflict between the tax preparer's duty to protect the confidentiality of the client's information and their duty to act in the public interest.

This case is intended for use in an undergraduate individual income tax class. We have assigned it on an individual basis, although it could also be a group project. The professor could introduce the case in class with a discussion of professional responsibility and then possibly show the students that the two tax returns have similar income and tax amounts. This would help students to move to a more detailed examination of the two returns. The heart of the case is in questions two and three, which ask students to evaluate the ethical responsibilities of the return preparers. The last question asks students to think about the impact that state law could have on the preparer's responsibilities. For many students, this might be the first time that they have read and interpreted a law, so it might be helpful to lead students through Appendix 4, which summarizes the applicable state law.

Questions for Assignment (suggestions for responses and discussion follow each question and are in italics)

1. Compare the 2023 tax return of Roger and Joyce Pentlebraugh prepared and electronically filed by Staringbridge Associates, LLP (Exhibit 1) with the 2023 return published on Roger Pentlebraugh's campaign website (Exhibit 2). List the differences. You may assume that similar comparisons of Roger's 2022 and 2021 returns would yield similar results.

The differences between the 2023 tax return that Staringbridge prepared and the one that was published on Roger Pentlebraugh's campaign website are:

- *Several identifying numbers and addresses have been redacted on the published returns. This is customary and not, by itself, a cause for concern. Candidates differ on the practice of redacting the preparer information at the bottom of page 2 of form 1040. Some candidates redact all of the information, as Roger Pentlebraugh did. Others redact only the firm's PTIN and EIN.*
- *The Presidential Election Campaign boxes are not checked on the Staringbridge return, but they are checked on the published return.*
- *The first listed dependent is identified as Lisa Terrid on the Staringbridge return, and as Lisa Pentlebraugh on the published return.*
- *Line 21 of form 1040 shows $12,447 of income identified as "Gambling income" on the Staringbridge return, but as "Honoraria" on the published return.*
- *Line 16 of Schedule A shows $250 of charitable contributions on the Staringbridge return, an extremely small amount for a public-minded individual with adjusted gross income of $175,673. The published return shows $12,697 of charitable contributions.*

- *Line 28 of Schedule A on the Staringbridge return shows a deduction of $12,447 identified as "Gambling losses up to gambling income." No such deduction appears on the published return. Note that the loss of this deduction on the published return is exactly offset by the increase in charitable contributions noted above, so the total itemized deductions in line 39 of Schedule A is the same on both versions of the return.*
- *Line 1 of Schedule B of the Staringbridge return shows interest of $8,745 from Cayman National Bank. On the published return, the source of that interest income is identified as "United States Treasury."*
- *On the Staringbridge return, the Yes boxes on line 7a are both checked, indicating that Roger and Joyce Pentlebraugh have a financial account located outside the United States and that they are required to file FinCEN Form 114. The foreign country is identified in line 7b as "Cayman Islands." On the published return, the No box of line 7a is checked, and line 7b is left blank.*

Overall, the return prepared by Staringbridge Associates paints a picture of an affluent couple with a significant amount of funds in an offshore account, a propensity for gambling, and little evidence of generosity to charitable causes. The image presented in the published return is very different. It shows a family of high achievers who give back to those less fortunate and who invest in America.

2. Summarize the tax return preparer's responsibilities as set forth in the AICPA's Code of Professional Conduct and its Statements of Standards for Tax Services. The Code of Professional Conduct is available at: https://pub.aicpa.org/codeofconduct/Ethics.aspx# The SSTSs are available at: https://insights.aicpa.org/story/ssts/. What do you conclude about the ethical requirements and professional obligations of Staringbridge Associates, LLP? Is it ethical for the firm to make public the discrepancies between the returns that it prepared and the ones that Roger published? Is it permissible? Is it ethical and permissible for Staringbridge not to do so?

The responsibilities of CPA tax return preparers are described in the AICPA's Code of Professional Conduct. The code discusses both the preparer's obligation to act in the public interest and the duty to maintain client confidentiality. However, the code of conduct does not give specific instructions on the appropriate action for a CPA tax professional when the two values are in conflict with each other.

The AICPA Code of Professional Conduct states, "Members should accept the obligation to act in a way that will serve the public interest, honor the public trust, and demonstrate a commitment to professionalism." (0.300.030.01) The public interest is defined as "the collective well-being of the community of people and institutions that the profession serves." (0.300.030.02) It is clear that the collective well-being of Minnesota voters is best served if they have accurate information about their candidates.

The Code of Professional Conduct also states, "A member in public practice shall not disclose any confidential client information without the specific consent of the client." (1.700.001.01) Of course, Roger Pentlebraugh will not consent to the disclosure that he fraudulently altered his tax returns before he made them public. That puts the confidentiality rule in direct conflict with the public interest rule.

The Code of Professional Conduct acknowledges that conflicts may arise between parties that the CPA is called on to serve. In this case, the interests of Roger Pentlebraugh and the Minnesota voters are clearly in conflict. However, the Code is not specific about how such conflicts should be resolved. It merely says, "In resolving those conflicts, members should act with integrity, guided by the precept that when members fulfill their responsibility to the public, clients' and employers' interests are best served." (0.300.030.03)

The Statements on Standards for Tax Services emphasize the importance for a CPA tax practitioner to protect confidential client information. All of section 1.3 of Statement 1 covers the practitioner's responsibilities "related to the protection of taxpayer data obtained in the course of rendering services for a taxpayer." (1.3.1) While most of the section concerns protection against data breaches, the statement is clear that the practitioner has the responsibility to protect the confidentiality of the client's information.

The SSTSs do not explicitly address a practitioner's responsibility to serve the public interest except as it relates to ensuring compliance with relevant tax laws. That is not an issue in this case. The published tax returns clearly contain significant deficiencies in their information and those reports are based on returns that Staringbridge prepared and filed electronically. However, the original returns had only one intended user, the Internal Revenue Service, and Staringbridge has no reason to believe that the information sent to the IRS is inaccurate.

So, the question is whether Staringbridge has the right, or perhaps the duty, to disclose inaccuracies in the published returns, which they did not prepare but which were based on the returns they did prepare. The firm's duty of confidentiality and its duty to serve the public interest are in conflict. The authors believe that there is no definitive answer to this question. Students' responses have ranged from one end of the spectrum to the other. Some say, in effect, "Sorry, we hate to let Roger get away with this fraud on the electorate, but we're just not allowed to say anything." Others take the opposite view, insisting, "Forget the confidentiality rules; this assault on democracy cannot be allowed to stand." The question can give rise to lively debate.

3. Does Roger's mention of Staringbridge Associates, LLP on the television program Minnesota Sunday Morning affect Staringbridge's rights and responsibilities in this case? Here is an excerpt from the transcript of Roger Pentlebraugh's comments about Staringbridge on Minnesota Sunday Morning:

Moderator: Thank you, Mr. Pentlebraugh. Now, as you know, it's customary for people running for office in Minnesota—and across the country, for that matter—to release their tax returns to the public. Have you done that?

Pentlebraugh: Yes, Frank, we've put five years of returns on our website, 2019 through 2023, so anyone who wants to look them over can see what I've been up to.

Moderator: Who does your taxes?

Pentlebraugh: We had been using Staringbridge Associates for some years. They're one of the most highly respected accounting firms in Minneapolis.

Moderator: You're not with them anymore?
Pentlebraugh: No, since we moved to St. Cloud, we've switched to an outfit closer to home. They'll be handling our taxes beginning in 2024. They're a small firm, but they're very hard workers.

Moderator: Okay, thanks, Mr. Pentlebraugh. Now, you've made some interesting statements about United States immigration policy …

When Roger Pentlebraugh mentioned Staringbridge Associates on Minnesota Sunday Morning, he may have given the firm a way to resolve its ethical dilemma. Jennifer M. would be well within her rights to announce publicly that, contrary to what Roger said on television, Staringbridge did not prepare any of the returns shown on Roger's campaign web site. That would be technically true, because the published returns are different from the ones that Staringbridge prepared. Also, it was Pentlebraugh who published the returns and mentioned Staringbridge's name in connection with them. Of course, if Jennifer did make that public pronouncement, it would prompt reporters to ask, "Did you prepare any of his returns, as he said? If so, which years?" To that, Jennifer could only reply, "My professional rules of conduct prevent me from answering that question except in response to a lawfully issued subpoena."

4. How does Minnesota election law—specifically section 211B.06 regarding false political and campaign material—affect your answers, if at all? Here is the text of section 211B.06 of the Minnesota Statutes:

Subdivision 1. Gross misdemeanor.

(a) A person is guilty of a gross misdemeanor who intentionally participates in the preparation, dissemination, or broadcast of paid political advertising or campaign material with respect to the personal or political character or acts of a candidate, or with respect to the effect of a ballot question, that is designed or tends to elect, injure, promote, or defeat a candidate for nomination or election to a public office or to promote or defeat a ballot question, that is false, and that the person knows is false or communicates to others with reckless disregard of whether it is false.

(b) A person is guilty of a misdemeanor who intentionally participates in the drafting of a letter to the editor with respect to the personal or political character or acts of a candidate, or with respect to the effect of a ballot question, that is designed or tends to elect, injure, promote, or defeat any candidate for nomination or election to a public

office or to promote or defeat a ballot question, that is false, and that the person knows is false or communicates to others with reckless disregard of whether it is false.

Subdivision 2. Exception.

Subdivision 1 does not apply to any person or organization whose sole act is, in the normal course of their business, the printing, manufacturing, or dissemination of false information.

The outcome could very well be affected by the Minnesota election law that makes it a crime to deliberately falsify campaign material. (This case was set in Minnesota specifically because it is one of only a very few states where this is a crime.) Upon hearing Jennifer M.'s answer to their request for further information about Pentlebraugh's tax returns, a diligent journalist would certainly contact the Minnesota Campaign Finance and Public Disclosure Board and ask if the board intends to resolve the question about the Pentlebraugh tax returns by issuing a subpoena for the records of Staringbridge Associates and any and all tax returns they prepared for Roger Pentlebraugh. If such a subpoena were issued, Staringbridge would be free to give the board all of their information, including the work papers created by John H. comparing Roger Pentlebraugh's published returns to the returns prepared and filed by Staringbridge.

REFERENCES

"AICPA Code of Professional Conduct," (2023). Available at et-cod.pdf.

"AICPA Statements of Standards for Tax Services," (2023). Available at https://insights.aicpa.org/story/ssts/

"AICPA Unveils Blueprints for Redesigned CPA Exam." (2023). Available at: AICPA Unveils Blueprints for Redesigned CPA Exam | News | AICPA & CIMA (aicpa-cima.com).

Chin, L. (March 1, 2024), "The CPA Exam Blueprint." *Becker*. Available at: CPA Exam Blueprint for 2024 | Becker.

Minnesota Statutes Section 211B.06 "False Political and Campaign Material." Available at https://www.revisor.mn.gov/statutes/cite/211B.06

Purcell III, T. J. and S. B. Anders. (February 2024). "Teaching tax ethics: Resources for educators." *The Tax Advisor*.

Author Biographies

Dean Crawford, Ph.D., CPA is a professor of accounting at the College of Business and Entrepreneurship in the State University of New York at Oswego. He specializes in accounting for taxation of individuals and business entities. He holds a Ph.D. from the University of Rochester and is licensed as a CPA by New York State. His publications include articles in Issues in Accounting Education, The Tax Adviser, The Journal of Accounting, Auditing, and Finance, and The Journal of Financial and Quantitative Analysis.

Diana R. Franz, Ph.D., CPA is a professor in the Department of Accounting in the John and Lillian Neff College of Business and Innovation at The University of Toledo. She has served as chair of the accounting department for approximately 20 years of her career. She has a Ph.D. from Texas Tech University. She has published in journals such as the *Journal of Financial and Quantitative Analysis*, *Journal of Accounting, Auditing, and Finance*, *Journal of Financial Research, Issues, in Accounting Education, Journal of International Accounting, Auditing and Taxation*, and *The Journal of Accountancy*.

This paper is under revision

A Comparison of Readability of the Most Popular Principles of Macroeconomics Textbooks

Mojtaba Seyedian, State University of New York at Fredonia, USA
Taihyeup Yi, State University of New York at Fredonia, USA
Jeffrey Forrest, Pennsylvania State System of Higher Education, Slippery Rock, USA

ABSTRACT

Selection of a textbook for an introductory macroeconomics course can be challenging. Many criteria may be considered in such decisions, including a textbook's readability level. Using the Flesch-Kincaid readability index, this study analyzes the predicted readability of five popular introductory macroeconomics textbooks. T-tests are performed to determine whether significant differences exist between the textbooks. The study finds that one textbook is clearly more readable than all of the others. These findings can be useful to adopters and editors of introductory macroeconomics textbooks.

Keywords: Readability, Macroeconomics, Textbooks

INTRODUCTION

The selection of a textbook for use in introductory macroeconomics courses is an important decision for faculty. Since introductory macroeconomics is a required course in the typical business and economics curricula, all the majors are affected by their decision. But the text selection process is complicated by the large number of text attributes for faculty to consider. Such attributes may include: a text's pedagogical approach; coverage of material; exhibits, charts, and vignettes; end-of-chapter material; student and instructor supplements; and authors' reputations, as well as instructors' past experiences with the text. Faculty may also wish to consider a text's *readability*.

Readability may be defined as the degree to which a class of people finds certain reading matter compelling and comprehensible (McLaughlin, 1969). "Readability" should not be confused with "legibility," which refers to the ease of being read. Readability, in this context, refers to the qualities of writing which are related to reader comprehension. A variety of techniques have been used to predict readability, including several readability indexes (or formulas) which have been used widely since the 1950s. Examples of readability indexes include SMOG (Simple Measure of Gobbledygook), Flesch Reading Ease, Flesch-Kincaid Grade Level, Gunning-Fog, Fry, and Coh-Metrix.

Information on readability can be helpful to faculty when making textbook adoption decisions. One of the criteria to which faculty attach the most significance in those decisions is textbook comprehensibility (Smith and DeRidder, 1997), which can be predicted, at least in part, using a readability index. Evidence also suggests that the higher the readability (difficulty) level of textbooks in core business courses, the lower the grade averages in those courses (Spinks and Wells, 1993).

As will be discussed in the following survey of literature section, the most recent study of readability of principles of macroeconomics textbooks was done in 2013 with no determination of the most or least readable textbooks available at the time. Obviously, during the past 11 years the textbook industry has witnessed tremendous changes that has resulted in fewer number of publishers, and in turn, fewer textbook availability. Our readability study should prove a timely contribution to the literature as new books by new authors have emerged on the market and as the older books have undergone several editions.

LITERATURE REVIEW

A careful survey of literature identifies only one work that deals specifically with the readability of principles of macroeconomics textbooks. Tinkler and Woods (2013), investigated whether there were differences in readability among 10 popular undergraduate principles of macroeconomics textbooks. The authors applied the Coh-Metrix readability index to a sample of three chapters (GDP, Money, Employment) of each book. However, they were not able to determine the most or the least readable book. Compared to principles of macroeconomics, we found quite a few studies of the readability of the principles of economics, which usually covers a less rigorous treatment of both Macro- and Micro-economics and is suitable for an elective course for non-economics majors. Among such studies,

the most recent one is Plucinski and Seyedian (2014). Applying the Flesch-Kincaid Grade Level index to 10 bestseller textbooks, they were able to determine the most and the least readable ones. In a much older study, Gallagher and Thompson (1981), the authors applied the Flesch Reading Ease Index to 15 principles of economics textbooks and were able to determine that one textbook was the most readable. However, McConnell (1982) was able to show that the application of various readability formulas to the same set of textbooks did not produce consistent results.

Some of the studies of textbook readability for other disciplines include: Pender, Stair, Stearns, and Villere (1976) in operation research, Raab, Stevens, and Stevens (1984) in taxation, Razek and Cone (1976) in business communication, Shuptrine and Lichtenstein (1985) in marketing, Villere and Stevens ((1976) in organizational behavior, Plucinski (2010) in accounting, and Plucinski and Seyedian (2013) in finance.

METHODS

Undergraduate students usually take the introductory course in macroeconomics during their sophomore year, after completing the prerequisite courses. Prior familiarity with the basics of mathematics and statistics is critical to a full grasp of the subject matter. A typical introductory macroeconomics textbook can be divided into six main topics: national income, monetary system, economics fluctuations, fiscal and monetary policy, and international trade. The location of these topics in the textbooks has always been largely dependent on the authors' choice. For this reason, the present study chooses the sample chapters for readability analysis such that they represent the five main topics in equal proportions.

Based on Amazon's "Best Sellers" list, and confirmed by the sales representatives of the four major publishing companies, the following top five most popular textbooks were chosen: Hubbard and O'Brien (2025), Mankiw (2024), Tucker (2023), Frank, Bernanke, Antonovics, and Heffetz (2024), and McConnell, Brue, and Flynn (2022). We randomly selected one 400-word text sample related to each of the topics mentioned above from the appropriate chapters of the chosen books. We then applied the Flesch-Kincaid Grade Level index to the selected passages using the word processing software, Microsoft Word. This software is capable of generating the readability index using large amount of text with objective results that can be readily analyzed and replicated.

Flesch-Kincaid Grade Level: The Flesch-Kincaid Grade Level has its roots in the Flesch Reading Ease formula developed in 1948 by Rudolf Flesch. In 1975, J. Peter Kincaid tested over 500 enlisted United States (U.S.) Navy personnel on a reading-comprehension test and also on passages from Navy training manuals. This enabled him to derive a version of the Flesch Reading Ease formula which yielded reading grade-level scores. The resulting Flesch-Kincaid Grade Level has since been adopted by the U.S. military services as the basis for deciding whether technical manuals from suppliers meet their readability requirements (Pearson, 2002). The Flesch-Kincaid index is now one of the leading readability indexes. It is used extensively by the U.S. government and others, and it is included as a grammar-checking feature in the word processing software, Microsoft Word (MS-Word).

The Flesch-Kincaid Grade Level formula is based upon sentence length and word length. It rates text on a U.S. school grade level. For example, a score of 11.0 means that an eleventh grader can understand the document. The formula is:

$$(0.39 \times ASL) + (11.8 \times ASW) - 15.59$$

where: ASL = average sentence length (the number of words divided by the number of sentences)

ASW = average number of syllables per word (the number of syllables divided by the number of words) (Pearson, 2002).

This study uses MS-Word to calculate the Flesch-Kincaid Grade Level of select passages. The formula used by MS-Word is confirmed by applying the formula above to that specified in the MS-Word help file. The MS-Word calculation is then validated by manually applying the formula above to a 200-word passage and confirming the result with that provided by the grammar-checking function in MS-Word.

Selection and Adaptation of Text Passages: An examination of the offerings of the four largest publishers of business/economics textbooks in the United States yields about twenty introductory macroeconomics texts currently being published in English. That number does not include the many variations of the main texts by the same author(s). To make this study manageable, a subset is chosen for consideration. However, fairly selecting among the many

alternatives is difficult. To make the results useful to the greatest number of instructors while limiting the number of texts, this study examines the most popular (best-selling) macroeconomics textbooks as listed in Table 1, along with each textbook's particulars.

Table 1: Principles of Macroeconomics Textbooks Tested

Authors	Hubbard	Mankiw	Tucker	Frank	McConnell
Title	Macroeconomics	Brief Principles of Macroeconomics	Macro-economics for Today	Principles of Macroeconomics	Macro-economics
Edition	9th	8th	11th	8th	21th
Year	2025	2024	2023	2024	2023
Publisher	Pearson	Cengage	Cengage	McGraw Hill	McGraw Hill
ISBN	9780138102494	9781285165912	9780357721094	9781265471644	9781259915673
Chapter Numbers Tested:					
National Income	8	5	5	5	7
Monetary System	14	11	14	10	15
Economic Fluctuations	13	15	6	12	9
Fiscal/ Monetary Policy	15	16	11	14	13
Demand & Supply	3	4	3	3	3
International Trade	18	13	18	16	19

A review of the list of each text's ancillary materials reveals comparable offerings among the texts. For students, each text has a study guide and online study aids (for example, quizzes and/or spreadsheets). For instructors, each text has an instructor/solutions manual, a testbank, transparencies, PowerPoint presentations, and test generation software. All of the publishers distinguish their products in some way, usually with additional online material. However, it is expected that an instructor will subjectively evaluate the usefulness of any distinctive ancillaries. Therefore, an examination of ancillaries is beyond the scope of this study. This study is limited to the main textbook.

As mentioned earlier, five chapters are respectively selected for analysis from the texts that provide passages covering about 30 percent of each text, based upon an average of 20 chapters per text.

A hardcopy of each text is obtained from the publishers. Digital content is then obtained for each of the five target chapters of each textbook by electronically scanning the relevant pages with optical character recognition (OCR) software. All files are then imported into MS-Word for analysis.

Only the sentences in the body of the chapters are subjected to analysis. Appendices are excluded. Since the Flesch-Kincaid formula analyzes only sentences, all material in figures, exhibits, and headings is omitted from analysis. Since material in graphics and vignettes cannot be readily converted to plain text by word-processing software, it is also omitted. End-of-chapter material (e.g., vocabulary, review, problems) is omitted as well, since it is largely quantitative/ tabular in appearance and does not match the textual nature of the Flesch-Kincaid index.

When a colon appears at the end of a sentence, it is replaced with a period when the sentence is originally followed by a calculation, list, or figure. This is necessary because, in the Flesch-Kincaid calculation, MS-Word does not recognize a colon as the end of a sentence. Since calculations, lists, and figures are removed from the text, a sentence with a colon preceding a figure, for example, would have been combined with the one following the figure, thereby inflating the length of the sentence. In that case, replacing the colon with a period "ends" the sentence before the figure. Colons appearing in sentences that eventually ended in a period are unchanged.

After converting, importing and pruning all files, the spelling and grammar function in MS-Word is applied to all files to correct occasional errors that arise and then to obtain the Flesch-Kincaid Grade Level. The text matter in the target chapters is not just sampled; the entire text matter of each of the five target chapters of each textbook is subjected to the Flesch-Kincaid calculation.

RESULTS

Comparison of Textbooks by Chapter: Table 2 shows the Flesch-Kincaid Grade Levels for the six target chapters of each textbook. The mean of the five grade levels for each text (MGL) is also shown. Since the grade level indicates the U.S. school grade level required to understand a text passage, the lower the grade level the more readable the chapter.

Table 2: Computed Flesch-Kincaid Grade Levels of Textbook Chapters

	Textbook (Author, et al)				
Chapter Content	Hubbard	Mankiw	Tucker	Frank	McConnell
National Income	11.8	9.9	12.2	10.9	9.0
Monetary System	13.2	10.7	13.1	12.4	10.2
Economic Fluctuations	11.2	10.7	12.5	11.7	9.3
Fiscal/Monetary Policy	13.3	11.4	13.0	12.6	10.4
Demand & Supply	13.4	11.1	13.2	12.1	10.7
International Trade	13.1	11.9	12.9	12.9	10.9
Mean Grade Level (MGL)	12.7	11.0	12.8	12.1	10.1

An examination of Table 2 reveals that among the five textbooks analyzed, the McConnell textbook is the most readable (has the lowest grade level) for each of the six chapters tested. For the *National Income* chapter, the McConnell textbook has a grade level of 9.0, compared to a range of 9.9 to 12.2 for the other textbooks. This chapter received the lowest grade level among the six chapters under study. Being the most fundamental chapter in any introductory macroeconomics textbook, this low index is a welcome sign for students and instructors.

The next best level for the McConnell text is 9.3 for the next most fundamental chapter, *Economic Fluctuations* (the range for the other texts for this chapter was 10.7 to 12.5). The least readable McConnell chapter is *International Trade* (10.9, compared to a range of 11.9 to 13.1 for the others). This result is expected, as the topic is fairly rigorous.

With a Mean Grade Level (MGL) of 10.1, the McConnell textbook appears to be the most readable by a wide margin. The Hubbard and Tucker texts, with MGLs of 12.7 and 12.8, respectively, appear to be the least readable textbooks. All five textbooks on average were more readable for the first three chapters tested than the last three chapters. This is perhaps because the last three chapters deal with the more complex and quantitative topics based heavily on microeconomic theories.

Overall Comparison of Textbooks: While the entire text of each target chapter is analyzed, those results constitute sample passages relative to the text overall. Therefore, t-tests are performed to determine whether significant differences exist between the textbooks overall. Independent-samples t-tests are performed on the sample means, without assuming equality of variances. Table 3 shows the p-values of differences between the MGLs of each textbook. The McConnell textbook is clearly the most readable. Its Mean Grade Level (MGL) of 10.1 is significantly lower than the Hubbard, Tucker, and Frank texts at the .01 level, and the Mankiw text at the .10 level. The Tucker textbook, with a mean of 12.8, is the least readable text; it is significantly higher than McConnell's and Mankiw's at the .01 level, and Frank's at .10 level. However, its mean difference with that of Hubbard's is not statistically significant at all.

Table 3: T-Test Results: P-Values of Differences Between Textbook Mean Grade Levels (MGLs)

Textbook Author, et al. (MGL)					
Hubbard (12.7)					
Mankiw (11.0)	.005***				
Tucker (12.8)	.726	.000***			
Frank (12.1)	.266	.018**	.065*		
McConnell (10.1)	.000***	.067*	.000***	.001***	
	Hubbard (12.7)	Mankiw (11.0)	Tucker (12.8)	Frank (12.1)	McConnell (10.1)
	Textbook Author, et al. (MGL)				

Notes:

*** Statistically significant difference at the .01 level;

** Statistically significant difference at the .05 level;

* Statistically significant difference at the .10 level.

Concentrating on the other books whose readability indexes fall somewhere between McConnell's and Tucker's, we observe: Hubbard's MGL is significantly (.01 level) different from Mankiw's, but not significantly different from Frank's; Mankiw's is significantly different from Frank's (.05 level) and Hubbard's (.01 level).

CONCLUSIONS AND LIMITATIONS

Conclusions: If an instructor places substantial emphasis on readability in selecting an introductory macroeconomics textbook, he/she should strongly consider the McConnell textbook. Its predicted readability is significantly higher than any of the other textbooks studied. The Mankiw text is a strong second-choice. Tucker's and Hubbard's, on the other hand, should be discounted, unless readability is not a major consideration in the textbook adoption decision. Also, in terms of readability, there is no compelling evidence to choose Frank's textbook.

Editors of introductory macroeconomics texts can also use these findings. There is more to comprehensibility of a subject than the readability of text matter. The diagrams, charts, demonstrations, calculations, and figures included in textbooks are intended to aid in the student's comprehension of the subject matter. Nonetheless, long, complicated sentences, while sometimes necessary, may hinder a student's comprehension when used extensively. Textbook editors may use these findings to set their expectations of authors of future introductory macroeconomics textbooks.

Limitations: One limitation in this study concerns readability formulas in general. They assume that the lower the readability level the better; but an unrealistically low readability level may lead to lower transferability of the content. In addition, readability formulas *predict* readability; they do not *measure* it. While there have been many critics that questioned the validity and value of readability formulas, there is ample research to suggest that formulas, despite their faults, can predict whether one piece of text will be easier to read than another (Pearson, 2002).

Secondly, the results of this study should not be the sole basis for judging the appropriateness of a particular introductory macroeconomics textbook. Only the main body of each target chapter was analyzed in this study. The calculations, vignettes, charts, exhibits, graphics, figures, and end-of-chapter material are excluded from analysis. Ancillaries such as instructor and student supplements are also not considered. It is likely that an instructor will subjectively evaluate the effectiveness of this material separately from the main body of the textbook.

Finally, as Smith and DeRidder (1997) indicated, business/economics faculty, when making a textbook selection, attach the most significance to comprehensibility to students, timeliness of text material, compatibility between text material and homework problems, and exposition quality of text, respectively. The first of those criteria, comprehensibility, is addressed (at least in part) by this study. Future studies might address comparisons of texts based upon the remaining criteria.

REFERENCES

Frank, R., Bernanke, B., Antonovics, K., and Heffetz, O. (2024). *Principles of Macroeconomics.* New York: McGraw Hill.

Gallagher, D. J. and Thompson, G. (1982). Textbooks in Management, Marketing and Finance: An Analysis of Readability. *Journal of Business Education.* V. 57, No. 4, pp 149-151.

Gallagher, D. J. and Thompson, G. (1981). A Readability Analysis of Selected Introductory Economics Textbooks. *Journal of Economic Education.* Summer, pp 60-63.

Hubbard, G. and O'Brien, A. (2025). *Macroeconomics.* New York: Pearson.

McConnell, C., Brue, S., and Flynn, S. (2023). *Macroeconomics.* New York: McGraw Hill.

McConnell, C. (1982). Readability Formulas as Applied to College Economics Textbooks. *Journal of Reading.* V. 26, No.1, pp 14-17.

McLaughlin, G. H. (1969). SMOG Grading – A New Readability Formula, *Journal of Reading.* V. 22, pp 639-646.

Mankiw, G. (2024). *Brief Principles of Macroeconomics.* New York: Cengage Learning.

Pearson, P. D. (2010). *Handbook of Reading Research*. Mahwah: Lawrence Erlbaum Associates.

Pender, B., Stair, R., Stearns, G., and Villere, M. (1976). The Readability of Operations Research and Operations Management Textbooks. *Interfaces*. V. 7, No. 1, pp 99-105.

Plucinski, K. J. (2010). Readability of Intermediate Accounting Textbooks. *Academy of Educational Leadership Journal.* V. 14, No. 2, pp 49-57.

Raabe, W. A., Stevens, K., and Stevens, W. (1984). Tax Textbook Readability: An Application of the Cloze Method. *Journal of American Taxation Association*. V. 6, No. 1, pp 66-73.

Razek, J. R. and Cone, R. (1976). Readability of Business Communication Textbooks – An Empirical Study. *Journal of Business communication*. V. 18, No. 2, pp 33-40.

Seyedian, M., Yi, T. and Fitzpatrick, J. (2021). Measuring Readability Levels of Undergraduate Investment Textbooks. *Journal of Higher Education Theory and Practice*. V. 21, No. 10 pp 143-149.

Shuptrine, F. K. and Licktenstein, D. (1985). Measuring Readability Levels of Undergraduate Marketing Textbooks. *Journal of Marketing Education*. V. 7, No. 3, pp 38-45.

Smith, K. J. and DeRidder, J. (1997). The Selection Process for Accounting Textbooks: General Criteria and Publisher Incentives – A Survey. *Issues in Accounting Education*. V. 12, No. 2, pp 367-384.

Spinks, N. and Wells, B. (1993). Readability: A Textbook Selection Criterion. *Journal of Education for Business*. V. 69, No. 2, pp 83-88.

Tucker, I. (2023). *Macroeconomics for Today*. New York: Cengage Learning.

Villere, M. F. and Stearns, G. (1976). The Readability of Organizational Behavior Textbooks. *The Academy of Management Journal*. V. 19, No. 1, pp 132-137.

Willey, T., Willey, L., and Mendez, J. (1998). The Readability of Undergraduate Corporate Finance Texts. *Journal of Financial Education*. V. Fall, pp 31-34.

Enhancing Student Engagement in University for Academic and Professional Success

Sanela Porča, University of South Carolina Aiken, SC, USA
Paul R. Goodchild, Texas A&M University – Texarkana, TX, USA
Harshi Lodha Jain, Research Assistant, Augusta University, GA, USA
Abigail Sage Grover, Pacer Center, University of South Carolina Aiken, SC, USA

ABSTRACT

This study examines strategies to enhance student engagement in higher education, a crucial factor in achieving academic success and professional readiness. It investigates the impact of live-based learning (LBL) programs, which integrate real-world experiences into the curriculum. It analyzes student involvement in academic programs, extracurricular activities, and internships, comparing LBL students with their non-LBL counterparts at a southeastern state university. The findings reveal that LBL students demonstrate higher engagement in career-related activities and report more positive interactions with faculty. These results suggest that LBL programs may foster a more career-focused and faculty-engaged learning environment, offering valuable insights for universities seeking to optimize educational approaches and improve student outcomes.

Keywords: Live-based learning, student engagement, student success, academic achievement, professional preparedness

INTRODUCTION

Institutions of higher education are increasingly focused on student engagement, recognizing its pivotal role in fostering academic performance, improving retention rates, and preparing graduates for successful professional careers (Whitten & Roberts, 2017). Considering this recognition, this study examines strategies to enhance student engagement, specifically investigating the impact of live-based learning (LBL) programs, which integrate real-world experiences into the curriculum.

By analyzing student experiences at a southeastern state university and comparing students involved in LBL programs with their non-LBL counterparts, the study aims to provide valuable insights into the effectiveness of LBL programs in promoting student engagement, academic achievement, and career readiness. Student engagement, which involves active participation in academic and extracurricular activities, is particularly salient within innovative educational models, such as live-based learning (LBL).

The concept of student engagement has evolved over the years, with researchers emphasizing its multidimensional nature (Garcia, 2019). Kuh (2009) articulates that engagement is inherently linked to academic success, stating that students actively participating in curricular and co-curricular activities tend to achieve higher academic outcomes. This active participation extends beyond mere attendance; it involves a psychological investment in learning, resulting in a sense of connection with the educational institution and a motivation to continue learning.

Live-based learning (LBL) represents a significant evolution in higher education pedagogy, emphasizing integrating academic learning with practical experience to better prepare students for the demands of the modern workforce. A contemporary, innovative curriculum developed at Malang State University in 2018, known as Life-based Learning, emphasizes cultivating life and career skills, necessitating innovative pedagogical approaches such as LBL. LBL is characterized by learning models that encourage students to identify problems, investigate them, make decisions, and solve them, thus mirroring real-world scenarios within the academic setting.

The definition of LBL encompasses enhanced extracurricular activities, such as competitions, research, and presentations; innovative internships in fields like artificial intelligence, start-ups, and entrepreneurship; and dynamic academic enrichment programs, including math competitions, STEM challenges, and art performances. This approach not only facilitates the development of essential skills such as critical thinking, creativity, communication, and collaboration but also addresses the need for universities to provide meaningful engagement opportunities that attract and retain students.

While the significance of student engagement is widely acknowledged, the specific impact of LBL programs on student engagement, academic achievement, and career readiness requires further exploration. Despite the widely accepted benefits of engagement, many institutions struggle to provide students with adequate opportunities to engage meaningfully. This study aims to address this gap by analyzing student experiences at a southeastern state university, comparing the experiences of students involved in LBL programs with those of their non-LBL counterparts.

This study investigates how student involvement in academic programs, extracurricular activities, and internships can be leveraged to enhance academic success and career readiness. This research is vital because it provides valuable insights into the effectiveness of LBL programs in promoting student engagement and offers practical implications for universities seeking to optimize their educational approaches to enhance student outcomes. The findings of this study reveal informative differences between the experiences of LBL and non-LBL students.

Notably, the results suggest that LBL programs foster a more career-focused and faculty-engaged learning environment. LBL students demonstrate higher engagement in career-related activities and report more positive interactions with faculty. These distinctions highlight the potential of LBL programs to enhance student preparedness for professional success.

PREVIOUS RESEARCH

Research has shown that student engagement is critical to learning outcomes, retention rates, and overall academic performance (Tight, 2020). Students who exhibit higher levels of engagement are more likely to commit to their educational journeys, resulting in improved achievement and persistence. Engagement manifests in various forms, including behavioral, emotional, and cognitive dimensions, each contributing uniquely to students' educational experience.

Student engagement has been examined within the higher education landscape. Kuh (2009) articulates that engagement is inherently linked to academic success; students actively participating in curricular and co-curricular activities tend to achieve higher educational outcomes. Research indicates that extracurricular activities, including internships and leadership roles, play a role in developing essential professional skills (Astin, 1999). Moreover, integrating academic learning with practical experience has prepared students for the workforce (Pascarella & Terenzini, 2005).

A modern, innovative curriculum developed at Malang State University in 2018, known as Life-based Learning, emphasizes cultivating life and career skills, necessitating innovative pedagogical approaches such as LBL to better prepare students for the demands of the modern workforce (Fachrunnisa et al., 2020). Our definition of LBL encompasses enhanced extracurricular activities, such as competitions, research, and presentations; innovative internships in artificial intelligence, start-ups, and entrepreneurship; and dynamic academic enrichment programs, including math competitions, STEM challenges, and art performances. The life-based learning approach offers learning models that teachers can apply, such as project-based learning, problem-based learning, or problem-based project learning. Through these learning models, students are invited to identify problems, investigate them, make decisions, and solve problems (Fachrunnisa et al., 2020).

The need to attract and retain students means that educators must be able to prepare students with the skills to think critically and creatively, communicate, and collaborate by integrating LBL into the learning process. Students experience learning as they would in their field of study. Despite the widely acknowledged benefits of engagement, many institutions struggle to provide students with adequate opportunities to engage meaningfully. This study examines student perceptions of student engagement within higher education, aiming to foster academic success and professional readiness.

METHODOLOGY

This study employed a survey methodology to examine university students' engagement in live-based learning (LBL) and non-LBL activities and assess the impact of these experiences on their academic and career success.

Participants
Participants consisted of undergraduate students from a southeastern state university. The survey was distributed through the university's email system, inviting students to voluntarily participate in a study about their experiences at the university. Participation was anonymous, and students could withdraw from the study at any time. Approximately 90 participants completed the survey, including 60 LBL participants and 30 non-LBL participants.

Instrument
The survey instrument was designed to collect data on students' involvement in academic and extracurricular activities. The instrument included multiple-choice, Likert scale, and open-ended questions. Specifically, questions addressed participation in:

- Academic enrichment programs
- Internships
- Leadership roles
- Extracurricular activities (e.g., student government, clubs, intramural sports)

The survey included questions about students' academic performance, coursework dedication, and educational responsibilities to compare the experiences of LBL and non-LBL participants. Additionally, the survey examined students' interactions with the educational environment, their peers, and available resources to understand the factors influencing academic performance. (See Appendix VII for a detailed description of the survey instrument.)

Data Analysis
Survey responses were analyzed to identify trends and correlations between student engagement in various activities and academic and career success. Statistical analyses, including chi-squared tests of independence (Gravetter et al., 2021), were conducted to examine differences in engagement between LBL and non-LBL student groups.

DISCUSSION

The survey instrument included a comprehensive set of questions to capture various facets of student engagement and experiences. This analysis focuses on the following questions (specify question numbers or topics) because they directly align with the study's primary objective of comparing the academic engagement, career readiness, and interactions with faculty of LBL and non-LBL students. Other questions provided valuable data on student satisfaction, time management, and social integration, but these were not central to the research questions guiding this analysis. A summary of all survey questions and responses is available from the corresponding author.

Academic and Engagement Activities
The data in Table 1 reveal meaningful differences in the engagement levels of LBL and non-LBL students.[1] The results demonstrate that LBL participants engaged more frequently in academic enhancement activities like honors courses and internships. This suggests that university-based LBL environments prioritize personalized learning and foster robust interactions between faculty and students.

On the other hand, non-LBL students tended to engage more in social activities, such as joining fraternities or sororities and participating in varsity sports, as well as having higher frequencies in global learning experiences and community service projects. LBL students preferred academic and professional development opportunities, highlighting a career-oriented focus in LBL programs.

Additionally, LBL students witnessed greater participation in internships and research collaborations with faculty, which are crucial factors for enhancing career readiness. While non-LBL students were less likely to engage in these enriching experiences, this suggests that integrating more career-focused opportunities could benefit them.

The preferences for independent study projects and consistent homework completion were markedly different between the two populations. LBL students displayed higher motivation and engagement in independent projects, whereas non-LBL students were more prone to occasional engagement. This disparity suggests that LBL programs effectively encourage self-directed academic exploration.

[1] Please see the Limitations section regarding the lack of statistical significance. Chi-squared test requires a minimum of five observations per cell, which were not always present in this dataset. Our analysis focuses on practical importance

Academic Support and Development: Comparison of LBL and Non-LBL Students
The survey results from Table 2 indicate significant disparities in academic support and development opportunities between LBL and non-LBL students. LBL students are more likely to be encouraged to pursue advanced studies, with 41.38% frequently receiving encouragement from faculty compared to just 13.33% of non-LBL students. This highlights the active role of LBL programs in fostering academic aspirations.

Regarding research opportunities, the frequency of engagement in research projects is far higher among LBL students (18.97%) than their non-LBL peers (6.67%), suggesting that LBL programs provide better mechanisms for student involvement in scholarly activities. Likewise, many LBL students reported receiving emotional support and academic guidance, which are crucial components of a nurturing educational environment.

Additionally, LBL students received more feedback on academic work (68.97%) compared to 43.33% for non-LBL students, thus indicating that consistent feedback may be instrumental in fostering academic growth. The findings also demonstrated that LBL programs provide students with more frequent stimulation and challenge, enhancing learning outcomes and satisfaction.

Academic and Engagement Activities
The survey results from Table 3 highlight differences in participants' academic and engagement activities. LBL students are likelier to engage in activities that contribute to academic and professional development. For instance, 40.0% of LBL students reported working full-time while attending school, compared to only 6.5% of non-LBL students. This suggests that LBL programs may attract or support students who need to balance work and academics.

Additionally, LBL students participated in internship programs at a higher rate (21.7%) than their non-LBL peers (3.2%). This disparity highlights the emphasis that LBL programs place on providing practical, career-related experiences. LBL students were also more likely to enroll in honors or advanced courses (26.7%) than non-LBL students (12.9%), indicating a stronger focus on academic rigor within LBL programs.

In contrast, non-LBL students showed a higher rate of transferring from a 4-year university (19.4%) than LBL students (11.7%). This may indicate different academic pathways or priorities for non-LBL students. While both groups participate in extracurricular activities, the data suggests differences in the types of engagement, with LBL students leaning more towards career-enhancing experiences.

Participant Skill Changes
Table 4 presents participants' self-reported changes in skills since entering college. It details how students from both LBL and non-LBL groups assess changes in various skills. Overall, the data reveal that both groups report similar patterns of skill enhancement, with a general trend toward perceived improvement.

Many students indicated "Stronger" or "Much Stronger" development regardless of their LBL or non-LBL affiliation. This suggests that university attendance, in general, contributes to students' perceptions of improvement in areas such as general knowledge, analytical and problem-solving skills, and knowledge within a particular field.

Some notable differences exist between the groups. LBL students reported a larger increase in preparedness for employment after college, with 13.8% indicating 'Much Stronger' improvement, compared to 10.9% of non-LBL students. In contrast, non-LBL students reported a greater increase in their ability to manage time effectively, with 44.4% reporting more substantial improvement than LBL students at 25.9%.

While the percentages vary slightly across specific skills, the overall trend is a perceived positive development. This finding suggests that both LBL and non-LBL educational experiences offer students opportunities for skill enhancement, and students generally recognize these gains. LBL helps universities meet their goals of preparing students for employment.

Participant Traits vs. Average Person of Their Age

Table 5 presents how participants in the study rated their traits compared to the average person of their age, offering a self-assessment of various personal characteristics. The data reveal notable differences in how LBL and non-LBL students perceive themselves.

Most LBL and non-LBL students rated themselves as 'Average' or 'Above Average' across most traits, revealing some key distinctions. LBL students tended to rate themselves higher in creativity, with 29.3% indicating they were 'Higher' compared to only 6.7% of non-LBL students. This disparity of 22.6% suggests that LBL programs or the students they attract may foster a stronger sense of creative self-perception. Additionally, LBL students reported a higher drive to achieve (51.7%) than non-LBL students (43.3%).

Conversely, non-LBL students demonstrated a higher self-assessment of their artistic ability. A substantial 48.3% of non-LBL students rated their creative ability as 'Above Average,' while only 22.4% of LBL students did so. This difference of -25.9% indicates a potentially significant divergence in how these groups perceive their artistic talents. Non-LBL students also rated themselves higher in self-confidence (43.3%) than LBL students (24.1%).

The self-perceptions captured in Table 5 highlight some critical distinctions between LBL and non-LBL students. LBL students appear to have a stronger sense of creativity and drive, while non-LBL students express greater confidence in their artistic abilities and overall self-confidence. For universities, these findings suggest that LBL programs may cultivate specific personal attributes or attract students already possessing those traits. Understanding these differences can inform targeted support and development initiatives. For example, universities might further consider how to foster creative self-efficacy within LBL programs or provide resources to enhance self-confidence among LBL students. Recognizing the stronger artistic self-perception in non-LBL students, universities can tailor extracurricular or support services to meet the needs of this group.

Student Interactions with Professors

Table 6 details participants' interactions with professors, providing insight into the level and nature of faculty engagement experienced by LBL and non-LBL students. The data highlights some statistically significant differences, indicating variations in the quality and frequency of student-faculty interactions.

LBL students reported significantly more frequent encouragement to pursue graduate or professional study, with 41.4% receiving this encouragement 'Frequently' compared to only 13.3% of non-LBL students. This substantial difference of 28.0% suggests that LBL programs foster a culture where faculty actively mentor and guide students toward advanced academic pursuits.

Similarly, LBL students reported receiving more frequent feedback on their academic work, with 69.0% indicating they received feedback 'Frequently' compared to 43.3% of non-LBL students. This 25.6% difference underscores the potential for LBL programs to emphasize consistent and constructive feedback, which is crucial for student learning and development. LBL students also reported more frequent advice and guidance about their educational programs (41.4%) than non-LBL students (21.4%), a difference of 20%. LBL students reported more frequent emotional support and encouragement (34.5%) than non-LBL students (21.1%), a difference of 13.4%.

These findings suggest that LBL programs offer a more supportive and engaging learning environment, characterized by increased faculty interaction. For universities, these results underscore the importance of cultivating robust student-faculty relationships. LBL programs appear more effective, suggesting that other programs could benefit from adopting strategies that promote mentorship, feedback, and guidance. This could include faculty development initiatives focused on effective advising and feedback techniques, and creating structural opportunities for faculty-student interaction within curricula.

Participant Graduate or Professional Plans

Table 7 presents the graduate or professional plans of participants, offering a glimpse into the post-graduation aspirations of LBL and non-LBL students. The data reveal no statistically significant differences between the two groups in their immediate graduate or professional school plans.

The percentages vary slightly across the response categories, but the overall distribution of plans is similar for both LBL and non-LBL students. For example, 29.31% of LBL students and 31.03% of non-LBL students reported having 'No plans to apply to school now or in the future.'

The results suggest that participation in LBL programs does not significantly influence students' decisions to pursue graduate or professional education immediately after graduation. This indicates that LBL programs offer unique academic and career-related experiences; however, they do not drastically alter students' post-graduation plans compared to non-LBL programs. Universities can use this information to understand that factors beyond LBL participation are likely to drive students' decisions about further education, and they should consider a range of influences when advising students, including the industry.

Likelihood of Participating in Specific Activities

Table 8 presents participants' likelihood of participating in various activities if given the opportunity, exploring students' openness to different forms of experiential learning and engagement. LBL students were more likely to complete an internship or apprenticeship, with 44.8% indicating they were 'Extremely Likely' to participate, compared to 33.3% of non-LBL students. This 11.5% difference aligns with other findings suggesting a career and professional development focus within LBL programs.

Conversely, LBL students expressed less likelihood of completing a real-world-based project, with only 36.2% indicating they were 'Extremely Likely' to participate, compared to 52.4% of non-LBL students. This difference of -16.2% is notable and may suggest variations in how these groups perceive or prioritize different applied learning experiences.

These results provide valuable insights into students' preferences for experiential learning opportunities. The resurgence of interest in internships among LBL students highlights the importance of providing robust internship programs, particularly for students in LBL programs. The lower interest in real-world projects among LBL students than non-LBL students warrants further exploration. Universities can utilize this data to tailor their program offerings, ensuring they align with student interests and potentially increasing student engagement and satisfaction.

Summary of Findings

The findings in Tables 1-8 provide a comprehensive overview of student experiences and engagement within LBL and non-LBL programs. Many observed differences between LBL and non-LBL students did not reach statistical significance, but the consistent trends suggest meaningful practical implications. For example, LBL students demonstrated higher engagement in academic enhancement activities, which, while not statistically significant, points to the potential of LBL programs in fostering a more proactive approach to learning and career readiness. The data indicates a trend where LBL students participate more actively in internships and career-related activities, highlighting the potential of these programs to improve career preparedness. These findings suggest that, despite sample size limitations, the observed differences provide valuable insights into the potential benefits of LBL programs.

The analysis of student satisfaction revealed similar levels between the LBL and non-LBL groups (Table 1). This finding underscores the importance of universities prioritizing quality education and fostering positive student experiences. However, notable distinctions emerged in academic and engagement activities (Table 2). LBL students demonstrated higher engagement in career-related activities, such as work and internships, aligning with the mission of business schools to equip students with practical skills and real-world experience for workforce readiness. In contrast, non-LBL students reported higher rates of transferring from 4-year universities. These differences were further illustrated in Table 3. LBL students showed a greater propensity for working full-time, enrolling in honors courses, and participating in internships, highlighting a career-focused academic orientation. In contrast, non-LBL students participated more in social activities.

Skill development, as reported by students, showed similar levels of improvement across both groups (Table 4), indicating that both LBL and non-LBL environments contribute to overall skill enhancement. Notably, non-LBL students reported a greater increase in their ability to manage time effectively, a crucial skill for professional success. When examining personal traits (Table 5), LBL students rated themselves higher in creativity and drive to achieve, characteristics often valued in innovative business settings, while non-LBL students reported higher artistic ability and self-confidence. Interactions with faculty (Table 6) were reported more positively by LBL students, who indicated receiving more encouragement, feedback, and academic guidance, aligning with the university's goal of fostering supportive learning environments and strong mentorship relationships. Graduate and professional plans (Table 7) did not differ significantly between the groups, suggesting similar post-graduation aspirations. Finally, Table 8 highlights differences in students' likelihood of participating in specific activities, with LBL students expressing greater interest

in internships and non-LBL students showing more interest in real-world projects, suggesting an opportunity for universities to tailor experiential learning to align with diverse student preferences and career goals.

Although the statistical limitations necessitate careful interpretation, the results consistently suggest that LBL programs may offer a more career-focused and faculty-engaged learning environment. These findings are particularly relevant for business schools prioritizing practical skills, industry connections, and strong mentorship to prepare students for successful professional careers.

Implications for Higher Education Practice

This study emphasizes the necessity of fostering student engagement through diverse academic and extracurricular opportunities. The findings highlight differences between learning environments with and without LBL, influencing student success and preparedness. Institutions integrating structured career counseling, community service initiatives, and robust academic support mechanisms are better equipped to ensure student success in academic and professional domains.

Universities should encourage independent and collaborative learning activities to enhance student involvement further. By offering flexible, work-integrated learning options, institutions can better support students as they navigate their academic and professional commitments.

Actionable Recommendations for Non-LBL Programs

Several actionable strategies can be implemented for non-Live-Based Learning (non-LBL) programs to enhance student engagement and prepare students for academic and professional success. Firstly, fostering a robust mentorship culture is paramount. This involves providing comprehensive faculty training on effective advising and feedback techniques, alongside increasing readily accessible advising resources to offer personalized support and guidance to students. Secondly, expanding research and applied learning opportunities is crucial. Non-LBL programs should actively encourage collaboration between faculty and students to create structured internships and research opportunities, helping students contextualize theoretical knowledge within practical scenarios. This aligns with the observed higher engagement of LBL students in career-related activities like internships. Thirdly, implementing frequent and detailed feedback mechanisms is essential. Faculty should be encouraged to provide timely and constructive feedback on academic work, fostering an environment that promotes continuous academic improvement and enhances student engagement. This is particularly important given that LBL students reported significantly more frequent feedback on their academic work. Lastly, broadening global learning and interdisciplinary opportunities can enrich the educational journey for non-LBL students, providing them with a broader perspective and experience. While non-LBL students tended to engage more in social activities and global learning experiences, intentionally integrating more career-focused opportunities could benefit them. By adopting these strategies, non-LBL programs can cultivate learning environments that more closely align with the career-focused and faculty-engaged experiences observed in LBL programs, ultimately enhancing student outcomes and professional preparedness.

Conclusion

This study investigates the impact of live-based learning (LBL) programs on student engagement, academic achievement, and career readiness by comparing LBL students with their non-LBL counterparts at a southeastern state university. To address this, the research analyzed student involvement in academic programs, extracurricular activities, and internships, examining how these experiences influence student outcomes. The findings revealed several key distinctions between the experiences of LBL and non-LBL students. Specifically, LBL students engaged more in career-related activities, such as internships and work experience. They reported more positive interactions with faculty, including frequent encouragement, feedback, and academic guidance. In contrast, non-LBL students participated in social activities more frequently.

The study acknowledges limitations; however, the findings have important implications for higher education. The results suggest that LBL programs may foster a more career-focused and faculty-engaged learning environment, particularly relevant for universities and business schools that prepare students for successful professional careers. The emphasis on practical skills, industry connections, and strong mentorship within LBL programs aligns with the growing need for higher education institutions to provide students with relevant, real-world experiences. By highlighting the differences in student engagement and experiences between LBL and non-LBL programs, this research offers valuable insights for universities seeking to optimize their educational approaches and enhance student outcomes.

Limitations

This study acknowledges several limitations that warrant careful interpretation of its findings. First, the sample size of approximately 90 participants (60 LBL and 30 non-LBL students), which is two percent of the possible participants, limits the generalizability of the results to a larger population, resulting in many observed differences not reaching statistical significance due to the chi-squared test's requirement for a minimum of five observations per cell. While statistical significance was often not achieved, the consistent trends and meaningful differences observed between LBL and non-LBL groups offer valuable practical insights for higher education.

Additionally, the reliance on self-reported survey data may introduce potential biases, such as social desirability or recall bias, and the non-random sampling method may further limit the sample's representativeness. Future research employing larger, more diverse samples, incorporating longitudinal designs, and utilizing mixed-methods approaches, including qualitative data, would provide a more robust understanding of the long-term impact of LBL programs on student outcomes.

The calculated chi-squared values for the various analyses ranged from approximately 0.03 to 23.73, with corresponding p-values ranging from 0.04 to 33.61. The degrees of freedom for the chi-squared tests conducted in this study varied depending on the number of response categories for each survey question. For comparisons involving two response categories (e.g., 'Yes' or 'No' as presented in Table 3), the degrees of freedom were 1. For analyses with three response categories (e.g., 'Frequently', 'Occasionally', or 'Not At All', as detailed in Tables 2 and 6), the degrees of freedom were 2. Finally, for questions with five response categories (such as the satisfaction ratings in Table 1 and the skill changes or trait assessments in Tables 4, 5, 7, and 8), the degrees of freedom were 4. Therefore, the chi-squared tests performed across the various comparisons in this study utilized degrees of freedom ranging from 1 to 4. Though these specific values are not presented in the main text due to the final publication format of the tables, these complete statistical test results are available upon request from the corresponding author, ensuring full transparency and reproducibility.

Avenues for Additional Research

This study lays the groundwork for further investigation into the impact of LBL programs and student engagement. Additional research could build upon these findings in several ways:

- Longitudinal Studies: Future research could track students over an extended period to examine the long-term effects of LBL participation on career trajectories, professional success, and alum engagement.
- Qualitative Research: In-depth qualitative studies, such as interviews or focus groups, could provide richer insights into students' experiences in LBL programs, capturing the nuances of their engagement, challenges, and personal growth.
- Impact on Diverse Student Populations: Further research is necessary to investigate the effects of LBL programs on diverse student populations, including underrepresented minority students, first-generation college students, and students with disabilities.
- Comparison of Different LBL Models: Studies could compare the effectiveness of different LBL models or pedagogical approaches to identify best practices for implementation and maximize student outcomes.
- Influence of Institutional Support: Research could investigate the role of institutional support, resources, and policies in the success of LBL programs and student engagement.
- Broader Measures of Student Success: Future studies might incorporate a broader range of measures of student success, including critical thinking skills, civic engagement, and personal well-being, to provide a more holistic evaluation of LBL programs.

These additional research avenues can further contribute to understanding effective educational practices and inform the development of innovative programs that enhance student engagement and success in higher education.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

While preparing this work, the author used Gemini, Google's AI language model, and Grammarly AI. Gemini was used to refine the introduction, results, and conclusion sections and explore further research avenues. Grammarly was used to enhance grammar and style. After using these tools, the author reviewed and edited the content as needed and takes full responsibility for the publication's content.

REFERENCES

Astin, A. W. (1999). Student involvement: A developmental theory for higher education. Journal of University Student Development, 40(5), 518–529.

Beltyukova, S. A., & Fox, C. M. (2002). Student satisfaction as a measure of student development: Towards a universal metric. *Journal of University Student Development.*

Cassidy, S. (2016). The Academic Resilience Scale (ARS-30): A new multidimensional construct measure. *Frontiers in Psychology*, *7*. https://doi.org/10.3389/fpsyg.2016.01787

Fachrunnisa, R., Fitriyati, U., Susilo, H., Suwono, H., Setiawan, D., & Ibrohim, I. (2020). Life-based learning: Two trajectories of students in the biology education program. AIP Conference Proceedings. 2215. 030003. 10.1063/5.0000704.

Finley, A. (2021). How University Contributes" to" Workforce Success: Employer Views on What Matters Most. *Association of American Universities and Universities*.

Garcia, A. (2019). Student Perceptions of Bullying Victimization: Associations with Student Engagement and Teacher Support. https://core.ac.uk/download/220154691.pdf

Gravetter, F. J., Wallnau, L.B., Forzano, L.B., and Witnauer, J.E. (2021). Essentials of Statistics for the Behavioral Sciences. 10th ed. Boston: Cengage Learning.

Kuh, G. D. (2009). What student affairs professionals need to know about student engagement. Journal of University Student Development, 50(6), 683–706.

Pascarella, E. T., & Terenzini, P. T. (2005). How college affects students: A third decade of research. Jossey-Bass.

Ralston, S. J. (2020). Higher education's micro-credentialing craze: A postdigital- Deweyan critique. *Postdigital Science and Education*, *3*(1), 83–101. https://doi.org/10.1007/s42438-020-00121-8

Rohm, A. J., Stefl, M., & Ward, N. (2021). Future proof and real-world ready: The role of live project-based learning in students' skill development. *Journal of Marketing Education*, *43*(2), 204–215. https://doi.org/10.1177/02734753211001409

Tight, M. (2020) Student retention and engagement in higher education, Journal of Further and Higher Education, 44:5, 689-704, DOI: 10.1080/0309877X.2019.1576860

Whitten, D., James, A. G., & Roberts, C. (2017). Factors That Contribute to a Sense of Belonging in Business Students on a Small 4-Year Public Commuter Campus in the Midwest. Journal of College Student Retention: Research, Theory and Practice. https://doi.org/10.1177/1521025117726520

BIOGRAPHIES

Sanela Porča is the Timmerman Chair in Enterprise Development, Professor of Economics, and Pacer Center Director, School of Business Administration, University of South Carolina Aiken, 471 University Parkway, Aiken, SC 29801, 803-641-3232, corresponding author. sanelap@usca.edu

Paul R. Goodchild, Texas A&M University – Texarkana, pgoodchild@tamut.edu, is an Assistant Professor of Accounting, College of Business, Engineering, and Technology, Texas A&M University – Texarkana.

Harshi Lodha Jain is a research assistant at Augusta University.

Abigail Sage Grover is a research assistant at the Pacer Center, University of South Carolina Aiken.

Formative Assessment: Closing the Gap with Active Learning Quizzes

Amy Grace Vaughan, Zimpleman College of Business, Drake University – Iowa, USA
Daniel Finn, Zimpleman College of Business, Drake University – Iowa, USA

ABSTRACT

Formative assessment is often used as a tool to demonstrate to students their current level of knowledge and the gap between it and the level of learning that is desired. Active learning seeks to turn students from passive listeners to those dynamically engaged in learning who control their own course performance. The current study has undertaken evaluation of student performance in higher education on active learning assessments to evaluate whether they have a positive impact on subsequent formative and summative assessment scores. This study proposes a multi-faceted intervention that also incorporates attributes of working in teams, timing of feedback, question and feedback formats, and group size to additionally assess their effectiveness in a formative active learning task. This study involves students taking a business statistics course. The results found significant improvements in homework, test, and overall course scores when the active learning tasks were present.

Keywords: active learning, formative assessment, bonus quiz, *t* tests

INTRODUCTION

Higher education has frequent discussions regarding optimal teaching techniques and effective assessment tools to appropriately capture student learning and subsequent performance. Within these discussions there are numerous issues of interest. Are summative assessments sufficient or should there be formative assessments to track and guide student performance? What are active learning activities that successfully lead to increased student performance and class participation? Should students work individually or in teams? What are some attributes of optimal feedback? The study in this article aims to carry out an in-class activity that will address a number of these aforementioned questions and investigate whether this activity leads to increased student performance on formative and summative assessments. We first look at some of the research that addresses these various issues.

FORMATIVE FEEDBACK

Feedback is an integrated feature throughout any classroom, giving both educators and students the opportunity to develop an understanding of the course's required performance level or standard. In doing so, both parties can compare a student's performance to the established standard and formulate a plan to close the gap between actual and desired outcomes. Once a performance standard has been established, effective assessment can result in students' self-evaluation of learning and monitoring of their progress, encouraging students to practice self-reflection in all areas of their studies (Sadler, 1989; Jindal-Snape & Holmes, 2009; Shatzkin, 2022). Formative assessment should elucidate student errors in ongoing work and those constant feedback loops should foster a culture of students feeling enabled to improve their performance based on evidence that they themselves are generating (Stelmach et al., 2022). Sadler (1989) identified formative assessment as that which is concerned with how judgments about the quality of student responses can be used to improve the student's competence by avoiding trial-and-error learning. Summative assessment by contrast was identified as that which aims to summarize the achievement status of a student, typically towards the end of the course, and because it is passive, it does not normally have an immediate impact on student learning (Sadler, 1989). Brown and Knight (1994) stated pointedly that the distinction between formative and summative assessments is that formative feedback is done *for* students while summative assessment is done *to* students.

Past research has highlighted several benefits achieved via formative assessment - including promoting student motivation through instructor feedback, developing awareness of class progress achieved, and establishing direction as to which areas require more attention (Weurlander et al., 2012). These benefits should also contribute to the goal of improving students' learning through instructors' feedback on student performance (Sadler, 1998; Falchikov, 2005; Phelps, 2012; Morris et al., 2021). Students also have a vested interest in the timing of feedback, where feedback immediately applicable was viewed more favorably, as indicated by Price et al. (2010), Weurlander et al. (2012), and Koka et al. (2023). Bangert-Drowns et al. (1991) found in a meta-analysis that there was a significant difference in

effect size based on timing of feedback, with feedback that is delayed but returned within a short time frame having the largest positive result.

Students must be able to comprehend and then implement an instructor's feedback within the classroom to achieve a higher desired performance (Sadler, 1989; Black & Wiliam, 1998; Sadler, 1998; Nicol & Macfarlane-Dick, 2006). Feedback should offer specific ways learning tasks could be improved and should advance students' critical thinking and 'mindfulness' (Bangert-Downs et al., 1991), therefore extending beyond a justification of why a mark was received (Wisniewski et al., 2020). Simply correcting errors without offering specific explanations may not outright aid in closing the knowledge gap (Shepard, 2009). Sleeman et al. (1989) suggested both error remediation via corrective feedback and reteaching methods of instruction could be effective in related reviews of learning and research, but that the error-based results trump reteaching. Sassenrath and Garverick (1965) found that when groups of students were exposed to 4 different forms of feedback, the group which had each question reviewed and discussed by the instructor had significantly higher performance on subsequent exams than the other forms of feedback groups. Other past studies have shown that students disliked feedback that provided the bare-minimum justification for the grade received, perpetuating student belief that feedback has no 'feed-forward opportunity' in future summative assessments (Price et al., 2010).

ACTIVE LEARNING

Bonwell and Eison (1991) defined active learning as 'instructional activities involving students in doing things and thinking about what they are doing'. Koka et al. (2023) noted that active learning tasks turn students from passive listeners to engaged participants for the entire class period. According to Weaver (2006), active learning activities give instructors the feedback to gauge and, if need be, change the amount of delegated time spent on teaching a concept and the methods by which it is taught or explained. Activities should address a restricted number of academic objectives, allowing swift alterations to be effectively implemented to easily fit in with class instruction. Ideally, activities should use 'high-quality open-ended tasks' if given the option between such and multiple-choice tasks (Shepard, 2009). Nardo et al. (2022) also commented that class work should entail problem-solving questions that reflect the same type of open questions on exams, particularly for science related disciplines. Shepard further indicated that while there may not be much harm in the use of multiple-choice questions, this type of question offers no insight as to what specific information a student is not comprehending.

Hodgson and Pang (2012) noted that most students are assessment driven, spending most of their conscientious effort only on assignments that are graded and count towards their final grades in the course. Fitch et al., (1951), along with Townsend and Wheatley (1975), Kika et al., (1992), and Huang et al., (2023), found that administering frequent quizzes or active learning tasks in class led to significant increases in test scores. While quizzes appear to be helpful in classroom learning, Olsen et al., (1968) found that quizzes not contributing to the overall grade of the class were not effective in contributing to higher examination scores. Furthermore, Weurlander et al. (2012) indicated that students were motivated to study for individual assessments if they were awarded just a few extra credit points.

STUDENT COLLABORATION

Student collaboration is a critical element within the learning process and can be harnessed through formative assessment, which ultimately enhances a learning environment. Freeman and Dobbins (2013) suggested that self-esteem in both students and instructors can increase by engaging formative group assessment. Group active learning has been found to increase students' content knowledge, which leads them to feel their chances of success in the course are raised, which decreases their anxiety (Cooper et al., 2018). Cardozo et al. (2020) also found that an active learning methodology carried out via groups led to higher average exam scores and lower levels of stress and anxiety. Research has also shown that students learn by both discussing their ideas with others in written responses to questions, as well as through oral explanation during group assessment (Weurlander et al., 2012). When working with others, students are brought face to face with a wide range of ideas, and exposure to these expands their own repertoire of concepts. Collaboration also promotes success as part of positive goal interdependence, which is when students realize they can be successful in achieving their goals only if their peers are also successful (Johnson & Johnson, 1991; Zagal et al., 2006; Szewkis et.al, 2011; Jongjaroenkamol, 2023). Gaudet et al. (2010) also demonstrated that both high and low performing students experienced increased scores after engaging in small group learning, with the lower students reaping the largest benefit.

The positive effects of collaborative learning have been studied theoretically from a constructivist perspective, which focuses on how social interactions promote cognition and learning in opportunities of instructional conversation (Palincsar, 1998). Evans and Waring (2011) state that the constructivist perspective helps students self-regulate themselves and enables them to take greater ownership of their role within the feedback process. Giuliodori et al. (2009) found that both high and low performing students, when correct, can generally convince their peers. Constructivist learning also typically entails problem-based learning and cooperative learning discussions between fellow students and teachers (Loyens & Gijbels, 2008). Two-stage examinations which consist of a first stage in which students work individually followed by a second stage in which they work in groups were found to lead to increases in performance (Levy et al., 2018 and Song, 2021). Reciprocal peer tutoring, where students function as both tutor and tutee, has been found to provide increases in interaction, self-confidence, long term retention, and post-test scores (Dioso-Henson et al., 2009; Dioso-Henson, 2012; Miravet et al., 2014; Drozdenko et al., 2022).

Mulder et al. (2014) reported that the students who provided constructive feedback to others noted it was the most valuable part of a peer-review process in a post-review questionnaire. Those students also stated increased ability in detecting what was right or wrong in their own work after going through the peer review process. When looking at someone else's alternative approach to the assignment, students learned to reevaluate their own approaches and to justify their reasons for working on problems in a particular way. McDowell (1995) noted in a collaborative case study that students felt at the end of the projects they learned to have more confidence in their ideas and could push themselves forward into a leading role. They also felt that being able to accept and give criticism in a professional way of one's own and others' work is a beneficial skill that can be used in future professional environments. They learned how to refine their ideas and to provide each other with mutual support. Students often acknowledge the benefit of using their fellow students as a resource to assist them, while also getting increased feedback from the 'expert' professor in an active, collaborative environment about where they may have gone wrong (McDowell, 1995; Sosa et al., 2018; Downing et al., 2020).

A popular technique known as Team-Based Learning (TBL) was originally proposed by Michaelsen and Sweet (2008) as a way to promote participation in collaborative face-to-face activities. In TBL, groups are predetermined, permanent, and contain several students. In the current study, groups are only pairs that are formed by matching a student with their neighbor in class and may vary each class period (although this was after the seating chart was made permanent). Feedback from the professor is rapid, occurring in the next class period, but not immediate, as it often is with TBL. There is, however, still the attribute of immediate feedback present, but just from their partner who may have a similar or different answer. Similar to TBL, there is an individual readiness assurance test (iRAT) taken, but that piece is not graded. Previous research on TBL often focuses on whether it is effective at increasing team scores over individual scores. This paper focuses on whether there is improvement for individual students in their own homework and test scores due to this type of active learning intervention. The assignments are designed to promote critical thinking and collaborative work as they are always an open response problem, and a common answer must be negotiated and agreed upon. Swanson et al. (2019) state that TBL is most appropriate in courses that (1) require understanding of a significant body of information and (2) have a primary goal in the course to apply content by solving problems. Both of those attributes are present in the business statistics course in this study. An important deviation in this study from TBL is the size of the groups. In their meta-analysis, Swanson et al. (2019) report that most implementations of TBL involve teams of five to seven students, but that smaller groups were associated with better outcomes. In this study, teams consist only of pairs of students to help eliminate members who cannot be held individually accountable and may be social loafers, as mentioned in Jackson and Williams (1985) and Benning (2024), for example. These pairs also compel students to participate more fully and exert more effort on difficult tasks.

Time assigned for group discussion also creates an opportunity for a student to ask the instructor questions on a personalized level that would not compromise the student's perceived social comfort. A normal lecture style class may discourage students from raising their hands and freely asking questions to the room. By creating a one-on-one encounter where the instructor comes to the student during the quiz taking period when they raise their hand, the instructor ensures anonymity and eliminates a student's fear of asking a 'bad' question in the presence of their peers. Bryson and Hand (2007) found that students were more likely to engage in a classroom with instructors that developed an inviting environment with freely available discussion opportunities. Students may trust that their instructors are more 'in-tune' or engaged when group time is allocated and the professor is able to roam around the class freely, compared to a traditional lecture environment when the instructor's focus is the class as a whole when speaking. McLean and Attardi (2023) found that most students desire increases in interaction and time when the professor is approachable and available for help than what takes place in a pure lecture setting. In normal lecture courses, questions are asked aloud in full view of the entire class, which often discourages interactions from taking place. A solution to

this is that responses regarding one-on-one questions can be shared by the instructor in an overall discussion to the class at the end of the activity.

LONG-TERM KNOWLEDGE

Administration of periodic progress tests can assist in determining students' initial learning of the material as well as students' long-term retention of the material. Situations which create anxiety due to time constraints and requiring the recall of facts are also strongly associated with a surface approach to the task and do not result in deep learning (Marton & Saljo, 1984; Ramsden, 1992; McDowell, 1995). Nardo et al. (2022) stated that students desired more time on groupwork so they could meaningfully engage with the material and with one another. Altintas et al. (2014) and Ramsden (1992) emphasize that tasks which provide active involvement with the subject material and feedback on progress in learning are critical to promoting a deep learning approach. McLean and Attardi (2023) and Chow (2024) found that face-to-face peer feedback during an exercise provides students with immediate clarification on topics which leads to deeper understanding. Whitmore (2023) adds that active tasks equip students to be competent and confident when they encounter complex problems as future practitioners.

Students retaining their knowledge learned in a course long term is a desire of all instructors. One reason for assigning active learning tasks is to reduce learning deterioration that occurs between when material is taught in class and when a student begins to try and implement their knowledge on homework and test problems. By using active learning tasks, students get the opportunity to instigate their own thoughts in how best to approach a problem and practice their problem-solving skills. This will also help separate students' declared knowledge and competencies from real ones in a dynamic, but controlled environment (Olejniczak et al., 2020). A topic may seem well understood in class, but students may not be able to effectively carry out every nuance necessary to arrive at a correct conclusion or solution without practice.

The aforementioned research studies have all served to address individually the issues of prompt but slightly delayed feedback, feedback marks denoting errors with added explanation comments, open response questions on focused topics, collaborative learning with student interaction and peer tutoring, personalized attention for privately asked questions, points assigned to drive assignment importance, and frequent quizzing to decrease learning deterioration. Cohen et al. (2003) and Matta et al. (2024) note that when studying educational interventions, integrating mixed methods is challenging to evaluate. Olejniczak (2017) designed a learning method utilizing hands-on experience, quick feedback, and reflective discussion. Rezaei (2015) examined the effectiveness of the three items of frequent testing, open-book quizzes, and collaborative quizzes together with positive results. However, there still exists a gap in the literature that studies the effect that these individual strategies altogether have on students' scores. It is the purpose of this study to determine whether combining attributes of frequent active learning tasks results in improved performance on homework and test problems of corresponding concept topics.

METHODS AND RESULTS

This study was performed in an introductory business statistics course in a private, midwestern, AACSB-accredited university in the United States. A total of 88 students, 57% male and 43% female, were enrolled in two sections of the course with the same professor. The course was taught with traditional lectures where students listened and took notes on handouts provided in advance. One section of the course did contain the active learning tasks, and the other did not, and thus served as the control group. For the active learning bonus quiz activities conducted in this study, the problems were open response, open note, covering a topic taught the current or preceding period. Following Shepard's (2009) recommendation, bonus quiz, homework, and test questions presented to students within these assessment activities used only open response questions. The aim of this format, in addition to students expressing their level of understanding of the material, is to provide opportunities that highlight areas for student improvement.

Data Collection

The frequency of the bonus quiz activity occurred once every class period in a semester course that met twice per week. Students worked on a written solution to each quiz for several minutes individually and then were put together in teams of two where they discussed ideas before submitting their final written answers, committing to one answer per team. This forced the students to discuss varying possible results after critically assessing their own and their partner's work. The problem solving and discussion period follow Bonwell and Eison's (1991) previously mentioned definition of active learning as 'instructional activities involving students in doing things and thinking about what they

are doing'. The discussion was often lively, and teams frequently interacted with other teams after overhearing their discussions.

The pairs' quizzes were graded and recorded as correct or incorrect. Individual answers were neither collected nor graded. Points were given to reinforce students' perceived importance of the task (Weurlander et al., 2012). The opportunities for bonus points seemed to be taken seriously by the students given their cumulative effect towards their grades at the end of the semester. To address timeliness concerns, researchers in the current study returned problem feedback results the next class period after every bonus quiz assignment was submitted. To make formative feedback meaningful and beneficial, the researchers provided written corrections and comments as well as a discussed solution. The solution covered common mistakes before homeworks or tests on that same material were given, therefore providing feed-forward opportunities and encouraging better performance on subsequent formative and summative assignments. This aforementioned error remediation aimed to preemptively prevent them from committing any common errors discussed on subsequent homework assignments or tests and was accompanied with reteaching of a very specific concept if it was widely misunderstood.

Data Analysis

Each bonus quiz question was matched for this study with a homework and a test question that covered the same concept. All homework assignments were compulsory and scored after the bonus quizzes. Tests were closed book format, timed, and given after the bonus quizzes and homeworks were returned. There were three tests and three homework assignments in the class, one homework per test. Utilizing only the course data from the section with bonus quizzes, Z for two independent proportion tests were conducted to compare the overall proportion of correct responses between homework and test questions that were accompanied with a previous bonus quiz versus those without such a bonus quiz. Every effort was made to ensure that all problems under consideration were of the same level of difficulty. The null hypotheses for these tests are that the proportion of correct responses between homework/test problems that did have a bonus quiz activity are equal to the proportion of correct responses on those homework/test problems that did not have a bonus quiz activity. The alternative hypotheses are that:

H1: The proportion of correct responses between homework problems that did have a bonus quiz activity are higher than those homework problems that did not have a bonus quiz activity.
H2: The proportion of correct responses between test problems that did have a bonus quiz activity are higher than those test problems that did not have a bonus quiz activity.

Statistical Package for Social Science (SPSS) 25.0 was used for the analysis. In all tests, alpha = 0.05 was used to determine significance. In Table 1, we see the questions on the homework that were paired with a bonus quiz question and their overall correct proportion was compared to the overall correct proportion for separate homework questions which had not had a previous bonus quiz question. For homework one, there was a significant difference between the 82.4% and 70.1% correct proportions on the questions between those that did and did not have previous bonus quiz questions ($Z = 3.394$, $p = 0.0003$). There were no significant differences between the correct proportions on the other two homework assignments. This indicates only partial support of our alternative hypothesis as there was significant improvement in student performance found on one homework, but not the other two.

Table 1: Homework proportions for topics with a bonus quiz versus without a bonus quiz

	HW proportion correct with bonus activity	HW proportion correct without bonus activity	Z	p-value
Homework 1	0.8235	0.7007	3.394	0.0003**
Homework 2	0.7243	0.7324	-0.215	0.5853
Homework 3	0.6448	0.6570	-0.297	0.6169

* $p < .05$, ** $p < .01$

The same comparison was made with test questions which had a corresponding matching bonus quiz question versus separate test questions that did not have a matching bonus quiz question. Those results are seen in Table 2. For test three, there was a significant difference between the 65.6% and 56.0% correct proportions on the test questions between those that did and did not have previous bonus quiz questions ($Z = 2.292$, $p = 0.0109$). There were no significant differences between the correct proportions on the other two tests. This again indicates partial support of our alternative hypothesis as there was significant improvement in student performance found on one test, but not the

other two. In investigating homework and test performance, the only significant differences that occurred between groups of questions that did or did not have previous bonus quiz assessments led to a significant increase in performance for those where a previous bonus quiz was present.

Table 2: Test proportions for topics with a bonus quiz versus without a bonus quiz

	Test proportion correct with bonus activity	Test proportion correct without bonus activity	Z	p-value
Test 1	0.5846	0.5563	0.672	0.2508
Test 2	0.7574	0.7711	-0.383	0.6490
Test 3	0.6564	0.5596	2.292	0.0109*

* p < .05, ** p < .01

Comparing the course data from the section with bonus quizzes to the section without bonus quizzes, independent sample *t* tests were conducted to compare the mean scores between homeworks, tests, and overall course percentage. The null hypotheses for these tests are that the mean scores between the two sections, one with bonus quiz activity and one without, are equal. The alternative hypotheses are that:

H3: The homework mean scores in the section with bonus quiz activities are higher than those in the section that did not have bonus quiz activities.
H4: The test mean scores in the section with bonus quiz activities are higher than those in the section that did not have bonus quiz activities.
H5: The overall course mean scores in the section with bonus quiz activities are higher than those in the section that did not have bonus quiz activities.

For the homework, the maximum scores were 25, 26, and 25. The means and standard deviations for each group are provided in Table 3. The alternative hypothesis is supported for homework 3 with the means of 18.46 and 16.22 showing a significant statistical difference ($t = 1.808$, df = 86, p = 0.0371). This shows support that on this homework, the one from the class section with bonus quizzes does significantly outperform the control group section without the active learning tasks.

Table 3: Homework means for the course section with bonus quizzes versus the section without

	With bonus activities		Without bonus activities		*t*(86)	*p*	Cohen's *d*
	M	SD	M	SD			
Homework 1	18.76	4.62	18.1	4.96	0.527	0.2999	0.138
Homework 2	21.31	3.68	21.42	4.25	-0.111	0.4559	0.028
Homework 3	18.46	4.38	16.22	5.41	1.808	0.0371*	0.455

* p < .05, ** p < .01

Looking at Table 4, we see that hypothesis 4 is proven for Test 1 ($t = 2.227$, df = 86, p = 0.0143). The bonus quiz course section outperforms the one without the quizzes with a mean of 82.87 to 74.44. Had an alpha = 0.10 been used, the Test 2 means of 89.39 and 81.17 would also have been determined to be significantly different ($t = 1.442$, df = 86, p = 0.0837).

Table 4: Test and Overall Grade means for the course section with bonus quizzes versus the section without

	With bonus activities		Without bonus activities		*t*(86)	*p*	Cohen's *d*
	M	SD	M	SD			
Test 1	82.87	13.01	74.44	16.41	2.227	0.0143*	0.569
Test 2	89.39	8.33	81.17	23.15	1.442	0.0837	0.472
Test 3	82.42	11.19	81.79	18.83	0.130	0.4492	0.041
Course Grade	85.01	8.75	75.22	18.13	2.167	0.0220*	0.688

* p < .05, ** p < .01

Finally, when looking at hypothesis 5, we see that this too has turned out to be significantly supported. (Note that the bonus points were removed in the students' overall point total as to not skew the results for this test.) The overall

course grade from the bonus quiz section averaged 85.01, which was over the 75.22 from the section without the bonus active learning tasks (t = 2.167, df = 86, p = 0.0220). The difference in the overall course grades was 9.79 points, which was higher than the 8.43, 8.22, and 0.63 gain in points between the sections' tests. This is believed to be due to the weight of homework grades in their overall scores. Students can receive help with their homeworks from peers or professor office hours, leading to higher homework scores. However, they must test on their own, leaving some to score lower on exams. Since the homework scores are factored into their overall grade, it helps raise the overall grade of some of the students that do not test well. This also contributes to more of a difference in test scores than homework scores.

The experimental group performed better than the traditional methodology control group in multiple instances. Results show that these blended aspects helped students achieve a higher level of understanding, due to formative active learning tasks. In Tables 3 and 4, the values of Cohen's d, a standardized effect size for the difference between two means, are also provided. Values around 0.5, or between 0.2 and 0.8, are considered medium. For all items that were noted significant above for hypotheses 3 through 5, the Cohen's d values are 0.455, 0.569, 0.472, and 0.688, which are good medium effect sizes.

CONCLUSION

It was proposed that if students take frequent active learning bonus quizzes, they will perform better on subsequent homework and test problems than on homework and test problems that do not have a corresponding bonus quiz. While this study shows benefits of frequent and collaborative bonus quiz taking, there are still some educators who believe that frequent testing does not result in increases in scores (Başol & Johanson, 2009). However, in the current study, frequent bonus quizzes not only improved students' performance in the short term, as reflected in their progress on homeworks, but also improved their sustained understanding, as reflected on their tests. Therefore, frequent bonus quizzing was not only helpful in short-term learning but also in long-term critical thinking. This finding - that frequent testing, frequent bonus quizzes in this case, acts as an impetus to higher performance - has been reported in previous studies on frequent testing (Rezaei, 2015) and frequent feedback (McCord et al., 2015).

In addition to frequent testing, other aspects of classroom activities need to be present to lead to students' optimal performance. Chickering and Gamson (1987) offered principles of good practice in undergraduate education which included encouraging contact between students and faculty, developing reciprocity and cooperation among students, encouraging active learning, and giving prompt feedback. The current study utilizes active learning formative assessment which aims to incorporate these elements as well as those mentioned by other researchers in the classroom. As noted by Swanson et al. (2019), although like all other multi-component interventions it is impossible to attribute gains to individual components, the effects reflect only the attributes as a whole. These do, however, mimic the authentic real life multifaceted classroom experience. The combined attributes here of prompt but slightly delayed feedback, feedback marks denoting errors with added explanation comments, open response questions on focused topics, collaborative learning with student interaction and peer tutoring, personalized attention for privately asked questions, points assigned to drive assignment importance, and frequent quizzing to decrease learning deterioration serve to increase students' participation with their peers as well as the professor, engaging them in the learning process, thus aiding in closing their learning gap and driving increased performance.

Evaluative assessment is done to present information to instructors, academic administrators, and others who can assist in the implementation of steps to improve learning programs, teaching methods, and student outcomes. Nichols et al. (2009) suggested that the main goal of formative assessment is to improve student learning and performance. To make positive changes within the classroom, information garnered from formative assessment must be used in conjunction with the correct processes to quickly implement changes regarding student learning. Active learning formative assessment data collection enables instructors to continually adjust material concept explanation after students present their understanding of the material. If many students receive low marks on an activity, more time can be committed to that solution's explanation when students receive back their assignment. In subsequent semesters, more time may be given to the original instruction of those topics with low scores. These efforts lead to increased confidence of the instructor in their informed teaching approach and students in their subsequent learning.

Formative assessment serves to motivate students to close their knowledge gap in what becomes the elucidated difference between the current and the desired state of their level of learning. Montrosse-Moorhead et al. (2024) note that the constructivist learning framework incorporates valuing the merit or significance of something. The valuing done here is when students determine that putting the effort into formative activities, such as the bonus quizzes in this

study, will advance their overall level of understanding of the material and thus their course grade. The results from the current study have demonstrated some significant statistical differences between formative homework scores, summative test scores, and overall course grade when active learning formative bonus quizzes were present. It is noted that the standard deviations are higher in the section without the bonus activities than the one with the activities. This is due to some of the highest and lowest scoring students being in that section. The authors speculate that this can be attributed to the students' self-selection when they registered for the courses. A couple of students on the lower end were students who were repeating the course and a few on the higher end were strong overall students, both sets of which may not have wanted to participate in a section set up with group activities. To ensure there was no difference in the quality of students coming into each section of the course, the difference in their mean GPAs was found to be not significant ($t = 1.939$, df = 86, $p = 0.0558$) with averages of 3.232 and 2.965, with and without bonus respectively.

A limitation of this study is that it was restricted to a statistics course in one university. Additional studies should investigate whether similar gains are observed across courses in various other subjects. Longitudinal studies could also follow students through time to more effectively track long term learning and measure the amount of learning degradation after these types of effective active learning tasks have taken place. Future research could focus on student motivation within these active learning task environments. Students could be surveyed regarding their motivation levels, as well as any input they might provide on how to improve the activity or specific aspects which they believe lead to increases in scores. Another future topic could be tailoring feedback by students' age levels. Henderson et al. (2021) found that undergraduate students did find feedback useful, but that the desire for feedback did decrease as the students' year in school increased.

Students' motivation was not directly measured in this study. However, informal observation of the students suggests that these open-book group bonus quizzes lead to greater class participation, less test anxiety, and greater student satisfaction. Other studies across multiple universities, such as Allen et al. (2013), also have results where faculty have reported perceived increased student engagement due to these team-based learning activities compared to the traditional lecture format. This finding was also evident in students' evaluations of the instructor at the end of the semester. Not every homework or test showed significant improvement in scores on problems where previous bonus quiz questions were presented. However, there were significant differences found between some of the homework and test comparisons. The presence of these significant differences does reinforce the benefits that can be attained in the classroom when professors utilize formative assessment through active learning tasks. Our hope is that this research may help instructors rethink their formative and summative assessment strategies and strive to aggregate those that may achieve optimum student performance.

REFERENCES

Allen, R.E., Copeland, J., Franks, A.S., Karimi, R., McCollum, M., Riese, D.J., and Lin, A. (2013). Team-based learning in US colleges and schools of pharmacy. *American Journal of Pharmaceutical Education, 77(6),* 1-9.

Altintas, L., Altintas, O., and Caglar, Y. (2014). Modified use of team-based learning in the ophthalmology course for fifth-year medical students. *Advances in Physiology Education*, *38(1),* 46-48.

Bangert-Drowns, R.L., Kulik, C.C., Kulik, J.A., and Morgan, M.T. (1991). The instructional effect of feedback in test-like events. *Review of Educational Research, 61(2),* 213-238.

Başol, G. and Johanson, G. (2009). Effectiveness of frequent testing over achievement: A meta-analysis study. *International Journal of Human Sciences*, 6(2), 99–121.

Benning, T.M. (2024). Reducing free-riding in group projects in line with students' preferences: Does it matter if there is more at stake? *Active Learning in Higher Education, 25(2),* 242-257.

Black, P. and Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education, 5(1),* 7–73.

Bonwell, C.C. and Eison, J.A. (1991). Active learning: Creating excitement in the classroom. *ASHE-ERIC Higher Education Report No. 1.* Washington, D.C.: The George Washington University, School of Education and Human Development.

Brown, S. and Knight, P. (1994). *Assessing Learners in Higher Education*. London: Kogan Page.

Bryson, C. and Hand, L. (2007). The role of engagement in inspiring teaching and learning. *Innovations in Education and Teaching International, 44(4),* 349-362.

Cardozo, L.T., Ramos de Azevedo, M.A., Carvalho, M.S.M., Costa, R., Oliveira de Lima, P., and Marcondes, F.K. (2020). Effect of an active learning methodology combined with formative assessments on performance, test anxiety, and stress of university students. *Advances in Physiology Education, 44(4)*, 744-751.

Chickering, A.W. and Gramson, Z.F. (1987). Seven principles for good practice in undergraduate education. *Washington Center News, Fall 1987.*

Chow, M.F. (2024). Understanding student perspectives on peer feedback: Written versus video versus face-to-face dialog. *Active Learning in Higher Education. https://doi.org/10.1177/14697874241301263*

Cohen, D.K., Raudenbush, S.W., and Ball, D.L. (2003). Resources, instruction. and research. *Educational Evaluation and Policy Analysis, 25(2),* 119-142.

Conway, M.A., Cohen, G., and Stanhope, N. (1991). On the very long-term retention of knowledge acquired through formal education: Twelve years of cognitive psychology. *Journal of Experimental Psychology: General, 120*, 395-409.

Cooper, K.M., Downing, V.R., and Brownell, S.E. (2018). The influence of active learning practices on student anxiety in large-enrollment college science classrooms. *International Journal of STEM Education, 5(1)*, 1-18.

Dioso-Henson, L. (2012). The effect of reciprocal peer tutoring and non-reciprocal peer tutoring on the performance of students in college physics. *Research in Education, 87(1),* 34-49.
Dioso-Henson, L., Hagos, L.C. and Villapando, R.A. (2009). The effectiveness of reciprocal peer tutoring (RPT) on the academic performance of students in mathematics. *Proceedings of the 2nd International Conference of Teaching and Learning.*
Downing, V.R., Cooper, K.M., Cala, J.M., Gin, L.E., and Brownell, S.E. (2020). Fear of negative evaluation and student anxiety in community college active-learning science courses. *Life Sciences Education, 19(2)*, 1-16.
Drozdenko, R., Coelho, D., and Zarecki, T. (2022). The Efficacy of a Business Simulation in an Orientation Course on Student Engagement and Learning. *Business Education Innovation Journal, 14(1),* 30-37.
Evans, C. and Waring, M. (2011). Exploring students' perceptions of feedback in relation to cognitive styles and culture. *Research Papers in Education, 26(2)*, 171-190.
Falchikov, N. (2005). *Improving Assessment through Student Involvement.* London: Routledge-Falmer.
Fitch, M. L., Drucker, A.J., and Norton, A.J. Jr (1951). Frequent testing as a motivating factor in large lecture classes. *Journal of Educational Psychology, 42(1),* 1-20.
Freeman, R. and Dobbins, K. (2013). Are we serious about enhancing courses? Using the principles of assessment for learning to enhance course evaluation. *Assessment and Evaluation in Higher Education, 38(2),* 142-151.
Gaudet, A.D., Ramer, L.M., Nakonechny, J., Cragg, J.J., and Ramer, M.S. (2010). Small-group Learning in an upper-level university biology class enhances academic performance and student attitudes toward group work. *PLoS ONE, 5(12)*, 1-10.
Giuliodori, M.J., Lujan, H.L., and DiCarlo, S.E. (2009). Student interaction characteristics during collaborative group testing. *Advances in Physiology Education 33(1)*, 24-29.
Henderson, M., Ryan, T., Boud, D., Dawson, P., Phillips, M., Molloy, E., and Mahoney, P. (2021). The usefulness of feedback. *Active Learning in Higher Education, 22(3)*, 229-243.
Hodgson, P. and Pang, M.Y.C. (2012). Effective formative e-assessment of student learning: A study on a statistics course. *Assessment and Evaluation in Higher Education, 37(2),* 215-225.
Huang, C., Bradley, K.P., and Zhang, Q. (2023). Fostering Active Learning: The Effects of Using the Socrative App in Undergraduate Advanced Accounting Classes. *Business Education Innovation Journal, 15(2),* 30-34.
Jackson, J.M. and Williams, K.D. (1985). Social loafing on difficult tasks: Working collectively can improve performance. *Journal of Personality and Social Psychology, 49(4),* 937-942.
Jindal-Snape, D. and Holmes, E.A. (2009). A longitudinal study exploring perspectives of participants regarding reflective practice during their transition from higher education to professional practice. *Reflective Practice, 10(2),* 219–32.
Johnson, D.W., and Johnson, R.T. (1991). Learning Together and Alone. Englewood Cliffs, NJ: Prentice Hall.
Jongjaroenkamol, P. (2023). Using Team Rewards and Individual Assessment to Incentivize Collaboration in Team Projects. *Business Education Innovation Journal, 15(2),* 7-14.
Kika, F.M., McLaughlin, T.F., and Dixon, J. (1992). Effects of frequent testing of secondary algebra students. *Journal of Educational Research, 85(3),* 159-162.
Koka, R., Jurane-Bremane, A., and Koke, T. (2023). Formative assessment in higher education: From theory to practice. *European Journal of Social Sciences Education and Research, 10(4)*, 79-89.
Levy, D., Svoronos, T., and Klinger, M. (2023). Two-stage examinations: Can examinations be more formative experiences? *Active Learning in Higher Education*, *24*(2), 79-94.
Loyens, S.M.M. and Gijbels, D. (2008). Understanding the effects of constructivist learning environments: Including a multi-directional approach. *Instructional Science, 36(5)*, 351-357.
Marton, F. and Saljo, R. (1984). Approaches to Learning in Marton, F., D. Hounsell, and N. Entwistle. (eds) *The Experience of Learning*, Scottish Academic Press, Edinburgh.
Matta, C., Lindvall, J., and Ryve, A. (2024). The mechanistic rewards of data and theory integration for theory-based evaluation. *American Journal of Evaluation, 45(1),* 110-132.
McCord, M., Houseworth, M., and Michaelsen, L. (2015). The integrative business experience: Real choices and real consequences create real thinking. *Decision Sciences Journal of Innovative Education*, *13(3),* 411–429.
McDowell, L. (1995). The impact of innovative assessment on student learning. *Innovations in Education and Training International, 32(4),* 302-313.
McLean, S. and Attardi, S.M. (2023). Sage or guide? Student perceptions of the role of the instructor in a flipped classroom. *Active Learning in Higher Education, 24(1)*, 49-61.
Michaelsen, L., and Sweet, M. (2008). The essential elements of team-based learning. *New Directions for Teaching and Learning*, *116*, 7–27.
Miravet, L.M., Ciges, A.S. and Garcia, O.M. (2014). An experience of reciprocal peer tutoring at the university. *Procedia – Social and Behavioral Sciences, 116,* 2809-2818.
Montrosse-Moorhead, B., Schröter, D., and Becho, L.W. (2024). The garden of evaluation approaches. *American Journal of Evaluation, 45(2),* 166-185.
Morris, R., Perry, T., and Wardle, L. (2021). Formative assessment and feedback for learning in higher education: A systematic review. *Review of Education, 9(3),* 1-26.
Mulder, R.A., Pearce, J.M., and Baik, C. (2014). Peer review in higher education: Student perceptions before and after participation. *Active Learning in Higher Education, 15(2),* 157-171.
Nardo, J.E., Chapman, N.C., Shi, E.Y., Wieman, C., and Salehi, S. (2022) Perspectives on active learning: Challenges for equitable active learning implementation. *Journal of Chemical Education, 99(4)*, 1691-1699.
Nichols, P.D., Meyers, J.L., and Burling, K.S. (2009). A framework for evaluating and planning assessments intended to improve student achievement. *Educational Measurement: Issues and Practice, 28(3),* 14-23.
Nicol, D.J. and Macfarlane-Dick, D. (2006). Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. *Studies in Higher Education, 31(2),* 199–218.
Olejniczak, K. (2017). The game of knowledge brokering: A new method for increasing evaluation use. *American Journal of Evaluation, 38(4),* 554-576.
Olejniczak, K., Newcomer, K.E., and Meijer, S.A. (2020). Advancing evaluation practice with serious games. *American Journal of Evaluation, 41(3),* 339-366.
Olsen, R.E., Weber, L.J. and Dorner, J.L. (1968). Quizzes as teaching aids. *Journal of Medical Education, 43,* 941-942.
Palincsar, A.S. (1998). Social constructivist perspectives on teaching and learning. *Annual review of Psychology, 49,* 345-375.

Phelps, R.P. (2012). The effect of testing on student achievement, 1910-2010. *International Journal of Testing, 12(1)*: 21-43.
Price, M., Handley, K., Millar, J., and O'Donovan, B. (2010). Feedback: All that effort, but what is the effect? *Assessment and Evaluation in Higher Education, 35(3),* 277-289.
Ramsden, P. (1992). *Learning to Teach in Higher Education*, Routledge, London.
Rezaei, A.R. (2015). Frequent collaborative quiz taking and conceptual learning. *Active Learning in Higher Education, 16(3),* 187-196.
Sadler, D.R. (1989). Formative assessment and the design of instructional systems. *Instructional Science, 18(2),* 119–144.
Sadler, D.R. (1998). Formative assessment: Revisiting the territory. *Assessment in Education: Principles, Policy and Practice, 5,* 77–84.
Sassenrath, J.M. and Garverick, C.M. (1965). Effects of differential feedback from examinations on retention and transfer. *Journal of Educational Psychology, 56(5),* 259-263.
Shatzkin, M. (2022). The YOU DRIVE: A Deliberate Approach to Effective Active Learning. *Business Education Innovation Journal, 14(2),* 122-131.
Shepard, L.A. (2009). Commentary: Evaluating the validity of formative and interim assessment. *Educational Measurement: Issues and Practice, 28(3),* 32–37.
Sleeman, D., Kelly, A.E., Martinak, R., Ward, R.D., and Moore, J.L. (1989). Studies of diagnosis and remediation with high school algebra students. *Cognitive Science, 13,* 551– 568.
Song, J. (2022). An Experimental Study of the Effectiveness of Group Quiz in an Operations Management Course. *Business Education Innovation Journal, 14(2),* 97-101.
Sosa, P.M., Goncalves, R., Carpes, F.P., and Mello-Carpes, P.B. (2018). Active memory reactivation previous to the introduction of a new related content improves students' learning. *Advances in Physiology Education, 42(1)*, 75-78.
Stelmach, R.D., Fitch, E., Chen, M., Meekins, M., Flueckiger, R.M., and Colaço, R. (2022). An integrated MERLA (monitoring, evaluation, research, learning, and adapting) framework for evidence-based program improvement. *American Journal of Evaluation, 43(4),* 504-514.
Swanson, E., McCulley, L., Osman, D., Lewis, N., and Solis, M. (2019). The effect of team-based learning on content knowledge: A meta-analysis. *Active Learning in Higher Education*, *20(1),* 39–50.
Szewkis, E., Nussbaum, M., Rosen, T., Abalos, J., Denardin, F., Caballero, D., Tagle, A., and Alcoholado, C. (2011). Collaboration within large groups in the classroom. *Computer-Supported Collaborative Learning, 6,* 561-575.
Townsend, N.R. and Wheatley, G.H. (1975). Analysis of frequency of tests and varying feedback delays in college mathematics achievement. *College Student Journal, 9(1),* 32-36.
Weaver, M.R. (2006). Do students value feedback? Student perceptions of tutors' written responses. *Assessment and Evaluation in Higher Education, 31(3),* 379–394.
Weurlander, M., Soderberg, M., Scheja, M., Hult, H. and Wernerson, A. (2012). Exploring formative assessment as a tool for learning: Students' experiences of different methods of formative assessment. *Assessment and Evaluation in Higher Education, 37(6),* 747-760.
Whitmore, C.B. (2023). Teaching evaluation through community-engaged learning courses. *American Journal of Evaluation, 44(2),* 270-281.
Wisniewski, B., Zierer, K., and Hattie, J. (2020). The power of feedback revisited: A meta-analysis of educational feedback research. *Frontiers in Psychology, 10*, 3087.
Zagal, J.P., Rick, J., and His, I. (2006). Collaborative games: Lessons learned from board games. *Simulation and Gaming*, *37(1),* 24-40.

Amy Grace Vaughan, Ph.D., is an Associate Professor of Statistics in the Zimpleman College of Business at Drake University. Her research interests include nonparametrics, structural equation modeling, and active learning in higher education.

Daniel Finn was a Finance and Economics student in the Zimpleman College of Business at Drake University. His primary interests include financial markets, asset allocation, and finance innovation.

A Multi-faceted Approach to Aligning Workforce Demands and a Business Core Curriculum

Ken Chadwick, Nicholls State University – Thibodaux, LA USA
En Mao, Nicholls State University – Thibodaux, LA USA

ABSTRACT

Curriculum review is critical to delivering programs that equip students with skills to effectively compete in industry. Unfortunately, business schools often fail to adequately provide graduates with applied skills and competencies directly linked to employment outcomes (Rosenbaum, Russell-Bennett, and Contreras-Ramirez, 2021). Such shortcomings can be attributed, in part, to a failure to adequately refine curriculums. Consequently, aligning the needs of industry with the capabilities of business graduates is a timely issue. This research presents a model of a business school's core curriculum review to optimally identify and incorporate business core requirements necessary to achieve workforce and curriculum unanimity. This, in contrast to more traditional approaches which is often singular and less thorough in its focus (e.g., assessing the core by comparing course offerings with the peer, aspirant, and competitor schools). The model reflects business core review in progress at an AACSB-accredited business school.

Keywords: curriculum review, curriculum refinement, workforce needs

INTRODUCTION

Curriculum development and refinement is viewed as the design and delivery of programs, courses, and related content to students through various means (e.g., lectures, projects, internships, etc.) (Davey et al., 2011; Plewa et al., 2015). According to Ornstein and Hunkins (2009), curriculum development involves three stages: planning, implementation, and evaluation and includes the critical components of people, processes, and procedures. As a critical component of the evaluation stage, a regular and systematic review of one's curriculum is essential to ensuring it is relevant and aligned with both student and industry needs.

Business school programs generally consist of a general education (university core) requirement, a business core curriculum, and courses in the major. The business core curriculum is designed to expose all business students, regardless of their major, to foundational knowledge in each of the business disciplines. Because of its impact across the entire business student body, currency of content, and delivery, is vital to providing students with the competencies to succeed in an increasingly competitive, rapidly changing, business environment. Thus, the need to review and refine curriculums on a continuous basis. For this article, curriculum "development" is the refinement of an existing business core curriculum, both in design and delivery of content.

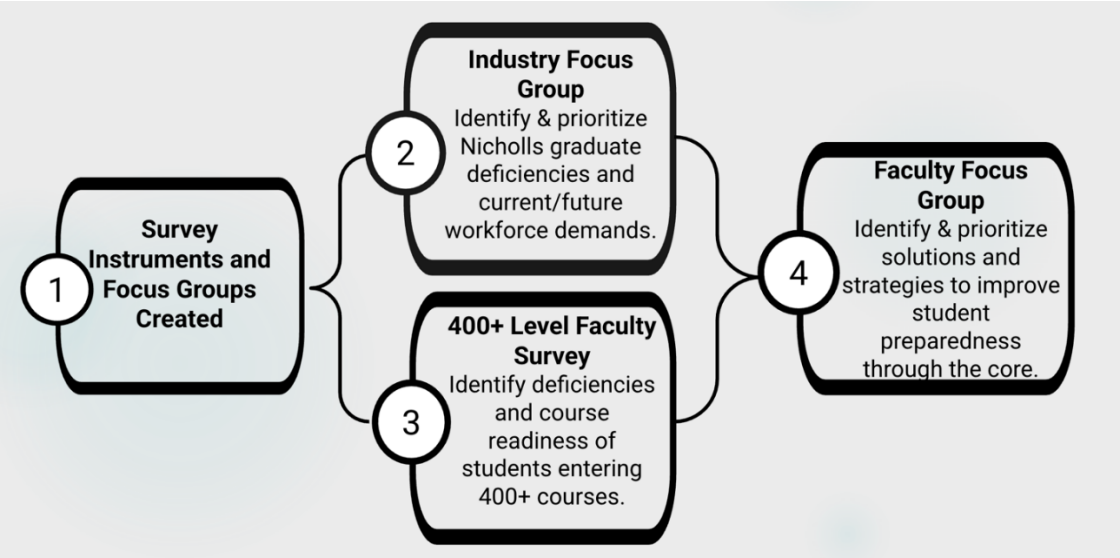
Unfortunately, business schools in higher education often fail to adequately provide graduates with applied skills and competencies directly linked to employment outcomes (Rosenbaum, Russell-Bennett and Contreras-Ramirez, 2021). Such criticism seems to be growing, and driving the call to better equip graduates with job competencies and attributes to better meet specific workforce needs and contribute to the success of hiring firms (Lawson, Fallshaw, Papadopoulos, Taylor and Zankom, 2011; Bisoux, 2018). This perspective supports findings from the *2022 Job Outlook Survey* by the National Association of Colleges and Employers (NACE), which reported that hiring managers and students have differing views on the skills and attributes graduates bring to the workforce (National Association of Colleges and Employers, 2022). Following record job growth after the pandemic, the latest NACE survey reports an overall decrease in business hiring (Collins and Gray, 2024). The decrease, concentrated in areas including accounting, finance, and real estate, signals a more competitive job market for graduates. Further evidence suggests a disconnect between business schools and workforce needs. The AACSB 2020 standards (and as updated in 2023), mandate that accredited business schools ensure their curricula provide learners with "currency, relevancy, and competency" (2020: 41). As a result, colleges of business are recognizing the value of relationships between universities and industry (Plewa et al., 2015; Shinn, 2018; Chadwick and Cashen, 2019) in pursuit of job ready graduates. Doing so in the business core helps ensure all students are better positioned to overcome misalignments between skillsets that are important to professionals, educators, and accrediting agencies such as AACSB (Kearns, 2014; Woodside, 2018a; Woodside, 2019).

As previously mentioned, aligning the needs of employer firms with the capabilities of business graduates is a timely and urgent issue. Maintaining a curriculum that is rooted in this alignment requires a regular, thorough, and multi-faceted assessment of courses, content, delivery methodologies, and the interrelationships of various disciplines. This research provides a model of curriculum and content assessment that seeks to optimally achieve workforce and business core curriculum alignment. The multifaceted approach is designed to identify and minimize deficiencies. This contrasts with the traditional approach often found in curriculum reviews, which tend to be more singular in focus and less thorough (e.g., simply assessing courses by comparing offerings with a college's peer, aspirant, and/or competitor schools of business). The proposed model presents a four-stage business core review and refinement initiative currently in progress at an AACSB-accredited business school. See Table 1.

The review includes: 1) a preparation stage, which includes the formation of an industry focus group and development of a survey instrument 2) identifying and prioritizing of graduate current and future workforce demands by use of the industry focus group, 3) surveying faculty teaching upper-level courses to assess student "readiness" upon entering the courses, and 4) a faculty focus group to identify and prioritize solutions and strategies for refining the core to better prepare graduates to meet future workforce demands.

The implementation of the curriculum review and suggestions for schools looking to implement a similar plan are presented in the following sections.

Table 1 – Business Core Revision Plan



In the fall of 2023, the Undergraduate Program and Instruction Committee (UPIC) at an AACSB-accredited school of business was charged with implementing a comprehensive review and refinement of the business core curriculum. The College's core consists of twelve courses and includes at least one from each of the business disciplines. The purpose of the core is to provide students with a broad overview and understanding of essential business principles so they can apply these concepts across various industries and roles within firms. The result being a cohort of graduates prepared to meet a broad range of workforce needs.

During the 2023-2024 academic year, UPIC met seven times plan for the core review and revision process. Those meetings focused on the tasks such as the planning of the focus groups, developing the survey instrument, and engaging with stakeholders. In addition, emails and informal discussions with the Dean, Department Heads, and individual faculty members were held prior to the Industry Focus Group.

UPIC applied a total quality management approach in developing and implementing the business core review. This included, among other elements, involving both internal and external stakeholders, utilizing cross-functional teams, a visual plan, and using data to drive decision making.

THE INDUSTRY FOCUS GROUP

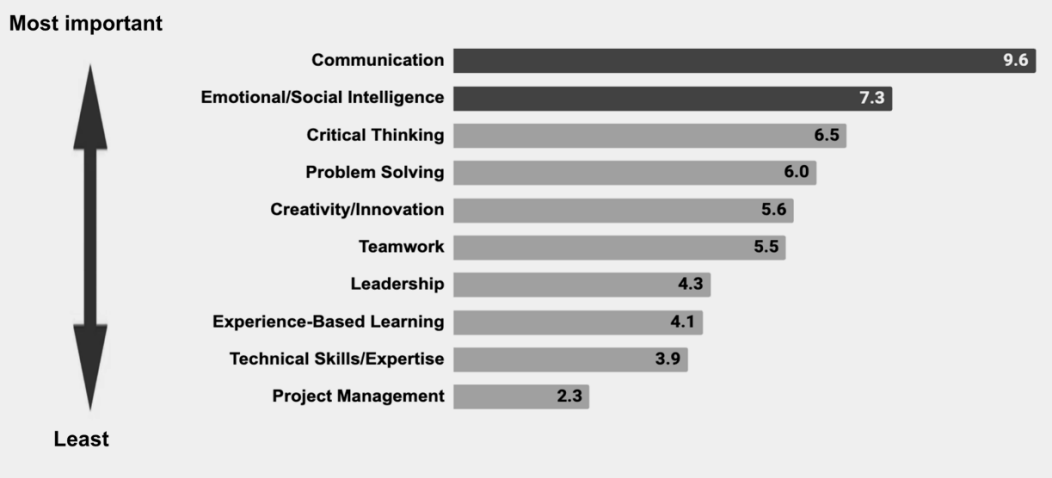
Focus groups are a recommended method for identifying diverse perspectives on program offerings and outcomes. Key questions to address include the purpose or key insights sought from participants, who should be included, and who will run the group. Data were collected with open-ended questions that are directed toward identifying critical skill sets and opportunities for change (Western University, 2019).

Faculty members leveraged their personal industry relationships to identify a group that represented both the functional areas of the business core and key industries of graduates. Specifically, the College sought to have at least one participant from each of the major areas of study. Potential focus group members were asked to volunteer their time to the curriculum review. The final group of eight were either alumni or actively involved in the College in some capacity (e.g., served as panelists, guest lecturers, recruiters, etc.).

Using the Delphi Method, the UPIC was able to extract the top 10 applied skills and competencies linked to employment outcomes and thus, most critical according to our panelists. The process began with a pre-meeting survey to solicit important skills for business graduates. The group provided a list of 132 various skills and knowledge areas. These were then synthesized into sixteen categories prior to the in-person focus group meeting. The goal was to have them enter the meeting focused on these sixteen generally accepted critical skills. During the meeting, panelists reviewed the skills and were asked to choose the top 10. A series of discussions was held to reach a consensus.

The focus group was then asked to rank these skills from 1 to 10, with 10 being most important. See Table 2. The score to the right side of the bar indicates the average of rankings. This ranking process was designed to help the College prioritize revisions to the business core curriculum.

Table 2 – Critical Skills as Identified by the Industry Focus Group



The panel pressed the College to focus on developing the top two skills in our students, "communication" and "emotional intelligence" which are highlighted in dark gray. In discussing strategies, the panel provided many actionable strategies relating to communication and emotional intelligence (EQ). See Figures 1 and 2.

In Figure 1, several key strategies and solutions related to communication skill development were identified by the focus group. One of the most notable themes was the need to assign more written work to students across the business curriculum. Specifically, the ability to write effective, professional emails—particularly client-facing correspondence—was highlighted as a consistent shortcoming among recent graduates entering the workforce. This challenge is not simply a technical skill deficit but reflects a broader gap in clarity of expression, tone management, audience awareness, and business etiquette.

To address these concerns, the focus group recommended a multi-faceted writing approach that moves beyond formulaic, rubric-driven assignments. They proposed the integration of unstructured writing tasks—assignments that intentionally withhold detailed instructions or rubrics. This instructional strategy aims to foster students' creativity,

critical thinking, and ability to formulate logical, audience-specific content. Similarly, ungraded assignments or those evaluated solely for completion can reduce performance anxiety and encourage experimentation, risk-taking, and authentic voice development.

Figure 1. Industry Focus Group Strategies and Solutions - Communication Skills

Another dimension of modern written communication discussed was the increasing importance of presentation slide writing. In today's business environment, especially with the shift toward hybrid and remote work, presentations often serve as both visual aids and stand-alone deliverables. The ability to craft clear, persuasive, and visually coherent slides has become a key professional competency. Therefore, the curriculum should emphasize not only oral delivery, but also how to design slides with contents that communicate effectively without verbal support.

In addition to written formats, the focus group stressed the value of individual presentations as a developmental tool. While group presentations are common in undergraduate programs, individual presentations foster a different set of skills—namely, self-reliance, confidence, and personal responsibility for message delivery. Incorporating more individual presentation opportunities can prepare students to become "generalists" who are well-rounded and capable of a variety of tasks in today's work environment.

Finally, the group addressed an increasingly overlooked area: professional phone call skills. As younger generations have grown up with texting and asynchronous communication, many students enter college—and later the workforce—with minimal experience making formal phone calls. This lack of exposure has led to notable discomfort, hesitance, and in some cases, avoidance. Yet, phone-based communication remains essential in many business functions, including sales, customer service, and client relationship management.

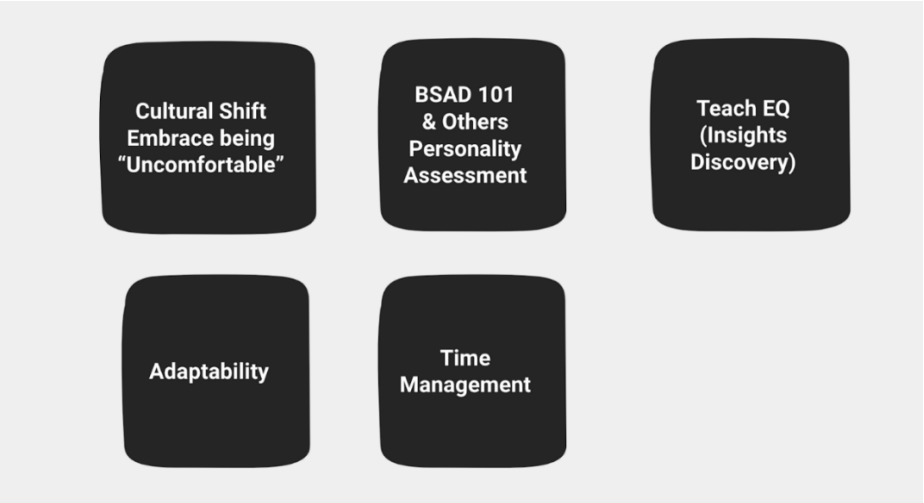
Taken together, these strategies advocate for a comprehensive and experiential approach to communication skill development. By diversifying the types of assignments and creating intentional practices, the curriculum can better prepare students to communicate with precision, adaptability, and professionalism in the modern workplace.

In Figure 2, strategies and solutions for developing emotional intelligence are presented. The focus group emphasized the importance of helping students embrace discomfort—a crucial component of emotional growth. This includes building resilience in the face of challenges, learning how to navigate difficult tasks, and accepting constructive criticism without disengaging. The group noted that an increasing number of students are expressing a desire to quit or withdraw after receiving feedback, which highlights a gap in emotional coping mechanisms and maturity.

To address this, the group recommended introducing self-awareness training as early as the freshman year, beginning in the BSAD 101 course, the introductory business course. Self-awareness serves as the foundation for emotional intelligence, enabling students to recognize and regulate their emotional responses, reflect on feedback, and remain open to continuous improvement. Tools such as Insights Discovery, already used in many professional

settings, were identified as valuable resources that can be adapted to higher education to help students better understand their communication styles, emotional triggers, and interpersonal dynamics.

Figure 2. Industry Focus Group Strategies and Solutions - Emotional Intelligence



In addition, the focus group stressed the importance of incorporating adaptability and time management into the curriculum. Today's business landscape is marked by constant technological advancements, hybrid work environments, and shifting industry demands. As such, adaptability is not merely a soft skill but a professional imperative. Students must learn how to pivot strategies, respond to new information, and remain flexible in uncertain environments.

Equally, time management is a critical skill that influences academic performance, mental health, and eventual career success. The ability to prioritize tasks, set realistic goals, and manage competing demands is often assumed rather than taught. Activities and assignments that help students internalize effective time management strategies are needed.

Together, these competencies—emotional intelligence, adaptability, and time management—are not just desirable; they are essential for producing graduates who are workplace-ready and capable of thriving in diverse and dynamic environments. The integration of these skills into the business core will not only enhance student development but also strengthen employer confidence in program outcomes.

THE FACULTY SURVEY

Faculty play a key role in curriculum reviews and revisions. This includes the use of surveys as part of a comprehensive approach to shaping curriculum changes to better meet student needs (Liu and Carter, 2020). In addition, faculty from various departments can provide unique perspectives and foster a more holistic approach to curriculum refinement (Reeve et al., 2019). Involving faculty also promotes ownership of the curriculum and enhances the likelihood of successfully implementing relevant and effective changes (Henderson et al., 2017).

A faculty survey was employed to provide further data on current core courses and educational objectives. The survey instrument was designed to assess perceived deficiencies and readiness of students entering senior level (400+ level) courses. Only one of the 400+ level courses is in the College's business core. This being the capstone course. Faculty members who teach senior level courses were asked to rate students' course readiness on thirty various knowledge and skills areas. A score of 1 indicates greatly falls short on that skill (a deficiency), 3 meets expectations, and 5 greatly exceeds expectations. The survey encompassed twenty-nine senior level courses and the results suggest that, according to the survey, twenty-three of the thirty skills did not meet faculty expectations.

Of the thirty skills, twenty-three were rated below 3 (deemed as deficient). Among the top 10 deficient areas, various communication skills were #4, #6, and #8. See Table 3. Interestingly, communication skills were deemed as the most

critical by the focus group. Such results support the idea that a multifaceted curriculum review allows for a more nuanced understanding of whether the curriculum meets its objectives and where improvements are needed.

Table 3 – Top Deficiencies as Identified by Faculty

THE FACULTY FOCUS GROUP

The final stage of the curriculum review and revision consisted of a faculty focus group. The goal was to identify and prioritize solutions and strategies to improve student preparedness through the core. The session was attended by 22 faculty members (75%). All business disciplines were represented at the meeting.

The meeting began with a recap of the methodology employed, the results of the industry focus group, and those of the faculty survey. What followed were focused discussions on recommended strategies and solutions from those in attendance. As expected, these discussions focused mainly on enhancing student communication and research skills, employing evidence-based techniques and interventions, and methods for tracking skills and knowledge development. Based on input from both internal and external stakeholders, the faculty focus group resulted in the emergence of specific recommendations for the College. These recommendations continue to be refined presently, as well as additional recommendations being made.

Following the faculty focus group, UPIC conducted a follow-up survey to gauge faculty acceptance of the review process and the developing action plan. A total of 11 faculty members responded. Overall, they felt extremely positive about the process (rating 4.8 out of 5 for the question "I feel positive about the core revision/review process.").
The College also held subsequent "faculty salons" where faculty continued discussing strategies to improve the core course delivery and content. The average attendance at the Salons was eight faculty members. Feedback gathered through the faculty focus group and salons support the premise that a multifaceted, collaborative curriculum review and refinement can foster a more holistic approach (Reeve et al., 2019) and promote ownership of the curriculum Henderson et al., 2017).

RECOMMENDATIONS

Continuous Curriculum Evaluation

Business schools should implement ongoing, systematic reviews of their curricula, including the core, to ensure that courses remain relevant and aligned with industry needs and evolving job market trends. This should involve regular interaction with stakeholders across academia and industry.

Faculty Engagement

Faculty should be intimately involved in the curriculum review and redesign process. Schools should facilitate ongoing faculty interactions (such as faculty salons) to discuss curriculum developments, share best practices, and address any emerging needs in both teaching strategies and content delivery.

Cross-disciplinary Collaboration
Integration of business disciplines/faculty is essential to identifying unique perspectives (Reeve et al., 2019) and enhances the likelihood of successfully implementing relevant and effective changes (Henderson et al., 2017).

Integration of Soft Skills and Emotional Intelligence
Given the perceived importance of communication skills and emotional intelligence, it is recommended that business schools strengthen the development of these skills throughout the curriculum. In addition, a dedicated course on business communication, taught by an industry practitioner could be implemented to address these skills.

By adopting these recommendations, business schools can better prepare students for the workforce, meet the demands of accrediting agencies, and ensure that their programs remain competitive in a rapidly changing, hypercompetitive, business environment.

CONCLUSION

A multifaceted business core curriculum review and revision is crucial for aligning educational programs with the needs of industry. It also plays a vital role in maintaining a college's reputation with stakeholders. A comprehensive approach helps ensure that curricula remain relevant and that the business school meets accreditation requirements with respect to providing a common body of business knowledge and continuous improvement.

The need for continuous refinement of business school curricula is more than merely keeping pace with industry trends. It also helps ensure that students are equipped with the applied skills and competencies directly linked to successful employment outcomes. By involving a variety of stakeholders, including industry professionals, faculty, alumni, and employers, a holistic and responsive business core curriculum can be maintained. This approach fosters a more nuanced understanding of student readiness by identifying critical skill gaps and strategic solutions. Our findings suggest that soft skills, particularly communication and emotional intelligence, are crucial for student success in the workplace.

REFERENCES

Bisoux, T. (2018). In service of a sector. *BizEd, 17*(May/June), 24-26.

Chadwick, K., and Cashen, L. (2019). The 'berth' of a maritime management program: A case study on value creation through industry-university collaboration. *Industry and Higher Education, 34*(2), 108-114. https://doi.org/10.1177/0950422219832736

Collins, M., and Gray, K. (2024, April 8). Job outlook spring update: Overall hiring dips, but most employers will maintain or increase hiring. *National Association of Colleges and Employers*. https://naceweb.org/job-market/trends-and-predictions/job-outlook-spring-update-overall-hiring-dips-but-most-employers-will-maintain-or-increase-hiring

Henderson, M., Greene, J., and Ray, S. (2017). Curriculum reform through faculty engagement: The importance of faculty focus groups in decision-making. *Journal of Curriculum and Instruction, 22*(1), 34-47.

Kearns, G. S. (2014). The importance of accounting information systems in the accounting curricula: A CPA perspective. *AIS Educator Journal, 9*(1), 24-40.

Lawson, R., Fallshaw, E., Papadopoulos, T., Taylor, T., and Zanko, M. (2011). Professional learning in business curriculum: Engaging industry, academics, and students. *Asian Social Science, 7*(4), 61-68. https://doi.org/10.5539/ass.v7n4p61

Liu, P., and Carter, R. (2020). Curriculum review in higher education: Best practices and faculty perspectives. *Educational Assessment Review, 12*(1), 34-51.

National Association of Colleges and Employers. (2022). *2022 job outlook survey*. Bethlehem, PA: National Association of Colleges and Employers.

Ornstein, A. C., and Hunkins, F. P. (2009). *Curriculum foundations, principles, and issues* (5th ed.). Boston: Allyn and Bacon.

Plewa, C., Davey, T., and Galán-Muros, V. (2015). Engaging business in curriculum design and delivery: A higher education institution perspective. *Higher Education, 70*(1), 35-53. https://doi.org/10.1007/s10734-014-9822-1

Reeve, M., Andrews, L., and Parsons, D. (2019). Engaging faculty in curriculum redesign: The effectiveness of focus groups in educational institutions. *Teaching and Learning in Higher Education, 10*(4), 439-453.

Rosenbaum, M., Russell-Bennett, R., and Contreras-Ramírez, G. (2021). Editorial: Business education in profound disruption. *Journal of Services Marketing, 35*(5), 553-558. https://doi.org/10.1108/JSM-11-2020-0432

Shinn, S. (2018, January 1). The faculty piece. *AACSB Insights*. https://www.aacsb.edu/insights/articles/2018/01/the-faculty-piece (Accessed January 16, 2023).

Western University. (2019, August 2). Conducting focus groups for curriculum review and improvement. *Centre for Teaching and Learning*.

Woodside, J. M. (2018a). Real-world rigour: An integrative learning approach for industry and higher education. *Industry and Higher Education, 32*(5), 285-289. https://doi.org/10.1177/0950422218767985

Woodside, J. M. (2018b). *Applied health analytics and informatics using SAS*. Cary, NC: SAS Press.

Woodside, J. M. (2019). A meta-analysis of AACSB program learning goals. *Journal of Education for Business*, 94(4), 221-227. https://doi.org/10.1080/08832323.2019.1678586

A Primer on Big Data and Analytics for Accounting Educator: Three Alternative Approaches to Curriculum Design

B. Brian Lee, Prairie View A&M University, Prairie View, Texas, USA
Young-Won Her, California State University at Northridge, California, USA
Moosa Khan, Prairie View A&M University, Prairie View, Texas, USA

ABSTRACT

Accounting educators have faced the need for accounting curriculum reform in response to the rise of big data and advancements in related technologies. By analyzing professional developments—such as the revised CPA exam and AACSB's updated accreditation criteria—and reviewing recent literature, the study evaluates three alternative approaches to curriculum development: standalone data analytics courses, integration within existing accounting subjects, and a hybrid model that combines elements of both. Each approach offers its benefits and challenges. The hybrid model, however, appears most practical as it encourages the gradual incorporation of analytics competencies across the curriculum while making centralized support available to subdiscipline accounting courses. Accordingly, technological advancements in accounting education prepare graduates to thrive in a data-driven world.

Keywords: Big Data, Data Analytics, Accounting Curriculum, AACSB Standards, Revised CPA Exam

INTRODUCTION

The vast availability of data from advanced technologies necessitates that accounting professionals acquire new skill sets to deliver relevant and value-added services. Traditionally, accountants have been trained to work with structured data generated by established accounting systems governed by regulations such as Generally Accepted Accounting Principles (GAAP). Financial data is recorded and classified according to accounting rules to produce financial reports, which serve as inputs for decision-making models.

However, advancements in information technology and data analytics now enable the transformation of diverse signals—such as numbers, images, and sounds—into data that can feed analytical models. These models generate insights that enhance decision-making beyond the reliance on conventional financial reports. This shift, driven by the increasing volume, variety, and velocity of data, demands that accounting professionals develop expertise in data analytics and emerging technologies.

Recognizing this need, the American Institute of Certified Public Accountants (AICPA) and the National Association of State Boards of Accountancy (NASBA) introduced a revised Certified Public Accountant (CPA) exam format that emphasizes information technology. In response, accounting firms have implemented data analytics and IT training programs to equip future professionals with the necessary skills to provide high-quality, value-added services. Similarly, the Association to Advance Collegiate Schools of Business (AACSB) underscores the importance of data analytics and technological agility in business and accounting education.

We examine how accounting curricula should evolve to meet industry demands and accreditation standards. By reviewing existing literature, we provide insights into the future direction of accounting education. Specifically, we explore three approaches to incorporating data analytics into the accounting curriculum: standalone courses, integrated modules, and hybrid models. Additionally, we evaluate the benefits and challenges of data analytics and information technology, offering guidance to accounting faculty on effective curriculum integration.

The paper is structured as follows. First, we examine recent changes in the accounting profession, industry, and accreditation standards in response to emerging technologies and big data. Next, we define big data and discuss methods for extracting valuable insights. Finally, we evaluate different approaches to integrating data analytics into accounting curricula and present our conclusions.

CHANGES IN THE ACCOUNTING PROFESSION AND ACCREDITATION STANDARDS

1. Accounting Profession

AICPA and NASBA introduced a revised format for the CPA exam, effective from 2024. The updated exam consists of two major components: core and discipline sections. The core sections include: 1) Auditing and Attestation (AUD), 2) Financial Accounting and Reporting (FAR), and 3) Taxation and Regulation (REG). CPA candidates must pass all three core sections, as required in the previous CPA exam. Additionally, they must complete one of the following discipline sections: 1) Business Analysis and Reporting (BAR), 2) Tax Compliance and Planning (TCP), and 3) Information Systems and Controls (ISC).

This new structure allows candidates to choose a discipline section based on their area of expertise rather than being required to take identical exam sections. To obtain CPA certification, candidates must complete all three core sections and one selected discipline section. Under the previous CPA exam format, candidates were required to pass four standardized sections: 1) Audit & Attestation (AUD), 2) Business Environment & Concepts (BEC), 3) Financial Accounting & Reporting (FAR), and 4) Regulation (REG). In the revised exam, content from these sections has been redistributed across the core and discipline sections, with BEC being eliminated. While all six sections incorporate data, analytics, and technology elements, the ISC section specifically focuses on data and technology competencies, including systems and organization controls, data management, information security, and related topics (Baldwin, Hurtt, and Hurtt, 2023).

Traditional accounting curricula that cover topics from the four-section CPA exam should adequately prepare students who choose BAR or TCP as their discipline section. However, students aiming to take ISC may find themselves underprepared unless they take additional coursework in information systems beyond the standard accounting curriculum. For example, a typical Accounting Information Systems (AIS) course may not provide sufficient exposure to technology-related topics. Students may need supplementary courses from Management Information Systems (MIS) or related departments to pursue the ISC discipline confidently. Alternatively, accounting programs could incorporate data analytics and technology courses to better align with industry demands.

Recognizing the growing importance of technology in accounting, the Pathways Commission, established by the American Accounting Association (AAA) and the AICPA, created a Technology Task Force to identify essential technologies for modern accounting education. The commission emphasized integrating these technologies into the accounting curriculum to ensure relevance (Pathways Commission, 2013). Similarly, the Certified Management Accountant (CMA) exam has responded to industry needs by including Technology and Analytics as one of the six core competencies in Part 1, underscoring its importance as a necessary skill set for business success (IMA, 2024).

The Big Four accounting firms—KPMG, Deloitte, PwC, and EY—offer programs designed to equip accounting students with essential data analytics skills and provide specialized coursework to enhance their expertise:

- KPMG's Master of Accounting with Data and Analytics (MADA) Program partners with 16 universities, offering accounting students up to $40,000 in tuition assistance and career opportunities.
- Deloitte's Graduate School Assistance Program (GSAP) provides tuition reimbursement for analysts pursuing graduate-level studies.
- PwC offers the Data and Analytics Academy, where individuals learn to use data science and analytics tools to extract relevant business insights from massive amounts of data.
- EY Academic Resource Center offers free educational resources to help faculty train students in emerging technologies.

These initiatives underscore the industry's commitment to integrating technology and data analytics into accounting education, ensuring students develop skills aligned with evolving business needs.

2. Accreditation Standards

AACSB has emphasized the growing importance of technology in business education. According to AACSB (2024a), "Technology will be ever important…to ensure that both learners and faculty are competent with current and emerging technologies" (p. 21). Degree programs must incorporate current and emerging technologies appropriately to ensure students develop agility in adapting to technological advancements.

AACSB (2024b) has expanded its accounting accreditation standards by introducing Standard A5, which mandates the integration of information technologies into accounting degree programs. This standard emphasizes:

- The ability of both faculty and students to adapt to emerging technologies
- The mastery of current technology in accounting education

Accredited accounting programs are expected to incorporate three key technology components: 1) Information Systems, 2) Data Analytics, and 3) Technology Agility. From an AACSB accreditation perspective, accounting has become more technology-driven than general business disciplines. As a result, accounting curricula must evolve to incorporate technology-related subjects, ensuring that faculty and students achieve higher learning outcomes in technology integration than their business counterparts.

AACSB (2024b) further emphasizes that accounting curricula should prepare students to manage big data generated by daily business activities. This includes competencies in:

- Data gathering, organization, and mining
- Analyzing data to produce actionable insights
- Storing and managing data for future use

As data analytics becomes a critical component of accounting education, the discipline must move beyond its traditional focus on processing structured financial data. Given the rapid evolution of business technologies, accounting faculty must continuously reassess and adapt their curricula to address content and teaching methodologies (Pincus, Stout, Sorensen, Stocks, and Lawson, 2017). This ongoing adaptation ensures that accounting education remains aligned with industry expectations, equipping students with cutting-edge skills necessary for success in a data-driven business environment.

BIG DATA AND TECHNOLOGIES

1. Understanding Big Data

Recent advances in information technology have led to the generation of vast amounts of big data characterized by diverse formats and high-speed processing capabilities. This wealth of data enables data scientists and professionals to extract valuable insights that benefit business entities. Ridsdale et al. (2015) highlight that by 2012, approximately 90% of the world's data had been generated within just two years, underscoring the growing trend for businesses to transition from being data-rich to information-rich and ultimately knowledge-rich (Vesset et al., 2014). The increasing significance of big data has created a high demand for skilled professionals capable of processing and analyzing large datasets. By 2018, the U.S. alone was projected to need nearly 200,000 data scientists and 1.5 million managers capable of incorporating big data into decision-making processes (Manyika et al., 2011; Ridsdale et al., 2015).

Big data is not solely defined by massive dataset sizes but also by the complexity of analysis associated with its attributes. Laney (2001) introduced the three Vs of big data:

- Volume – The sheer size of data generated and stored
- Velocity – The speed at which data is created, processed, and analyzed
- Variety – The diversity of data formats, types, and sources

Over time, researchers have expanded this framework to include additional V characteristics to better describe big data's evolving nature and impact. The U.S. Department of Commerce (2019) and Dow, Jacknis, and Watson (2021) identified more dimensions, including:

- Variability – The dynamic and unpredictable changes in data structures and meanings
- Veracity – The accuracy and reliability of data
- Validity – The extent to which data accurately represents what it is intended to measure
- Volatility – The rate at which data changes over time
- Visualization – The ability to present data in meaningful graphical formats
- Value – The impact of data on enhancing business decision-making

The National Institute of Standards and Technology (NIST) categorizes these Vs into two groups:

- Big Data Vs: Volume, Velocity, Variety, and Variability
- Additional Data Vs: Veracity, Validity, Volatility, Visualization, and Value

In contrast, Dow et al. (2021) classify the three Vs (Volume, Velocity, Variety) as external big data. Veracity, Visualization, Viscosity, and Virality are considered organizational data—derived from internal and external sources. Given these varying classifications, this paper follows the NIST framework.

Core Vs of Big Data

a. Volume is measured in terabytes (TB) or petabytes (PB), with 1 PB equal to 1,024 TB. For example, 1 TB is equivalent to storing approximately 220 DVDs or 16 million Facebook photos. Facebook alone stores an estimated 260 billion images, occupying over 20 PB of virtual space (Dow et al., 2021).

b. Velocity refers to the speed at which data is generated, accumulated, processed, and analyzed in real time. Data sources include: business transactions, social media feeds, Internet of Things (IoT) sensors, etc. For example, real-time browsing behavior allows companies to provide instant product recommendations to users. Organizations can leverage perishable data to make real-time business decisions, optimizing customer interactions and operations.

c. Variety represents diversity of data sources, formats and structures. Big data can be classified into three types:
   - Structured data – Organized in relational databases or spreadsheets, allowing easy machine processing. However, Cukier (2010) estimates that structured data accounts for only 5% of all existing data.
   - Unstructured data – Lacks a fixed format, making electronic processing more challenging (e.g., social media posts, emails, PDFs, audio, video, images).
   - Semi-structured data – Falls between structured and unstructured formats, such as XML files with semantic tags that enable partial organization. Unlike traditional databases, semi-structured data provides flexibility without requiring rigid formatting, allowing easier storage and retrieval.

d. Variability refers to unpredictable changes in data structures and meanings over time, complicating data interpretation. Examples include:
   - Fluctuations in online transactions (higher sales during holidays)
   - Stock price movements, which exhibit more significant variability compared to stable investments like bonds

Additional Vs of Big Data

e. Veracity refers to data quality, accuracy, and reliability. For example, a malfunctioning temperature sensor may provide inaccurate readings, affecting data integrity.

f. Validity assesses whether data correctly measures what it is intended to measure. For instance: If a box's weight is recorded in pounds but labeled as kilograms, the measurement is accurate (veracity) but invalid (misleading).

g. Volatility represents how frequently data changes. Highly volatile data, such as stock prices, shift rapidly throughout the trading day, requiring constant updates and analysis.

h. Visualization refers to using graphs, charts, and dashboards to simplify complex data and enhance comprehension. Well-designed visualizations enable decision-makers to extract insights quickly from large datasets.

i. Value represents the business impact of big data, ensuring that organizations can leverage it for informed decision-making. High-value data improves operational efficiency, enhances customer insights, and optimizes business strategies.

The expansion of big data analytics has transformed how organizations collect, process, and analyze information. While Volume, Velocity, and Variety remain the core attributes of big data, additional Vs such as Variability, Veracity, and Value play a crucial role in enhancing its utility. Businesses and researchers must continuously adapt to the evolving big data landscape, ensuring that data-driven decisions are accurate, relevant, and impactful.

Gamage (2016) categorized data into three groups based on volume and analysis complexity: financial, enterprise, and big data:

- Financial data are structured and regulated, ensuring accuracy and reliability.
- Enterprise data can be structured or unstructured and are generated for internal use, including customer records, emails, and social media streams. These data sources are managed within organizations through Enterprise Resource Planning (ERP) systems, Human Resources Information Systems (HRIS), and other enterprise applications.
- Big data are predominantly unstructured and sourced from external entities, such as Internet of Things (IoT) devices, social media feeds, and web search engines.

As data size and complexity grow, organizations increasingly require professionals with advanced technical and analytical skills to optimize data utilization in three key areas:

- Enhancing data asset value through robust controls – Data quickly loses its value without proper management.
- Improving decision-making quality – Providing real-time support and integrating inputs from internal and external stakeholders.
- Assessing potential risks in real-time – Enabling proactive risk management and mitigation (Gamage, 2016; Faccia and Petratos, 2024).

As a result, the future of the accounting profession is expected to expand beyond traditional financial expertise, incorporating finance, technology, and information management to provide a more comprehensive range of services to clients.

2. Extracting Insights from Big Data

Gandomi and Haider (2015) propose two key procedures for extracting meaningful insights from big data to support data-driven decision-making: Data Management and Analytics.

2.a. Data Management Process

The data management process consists of three stages:

- Acquisition and Recording – Capturing raw data from various sources.
- Extraction, Cleaning, and Annotation – Removing noise, correcting errors, and enriching data with metadata.
- Integration, Aggregation, and Representation – Combining datasets and presenting them in a structured format for analysis.

2.b. Analytics Process

The analytics process involves two stages:

- Modeling and Analysis – Applying statistical and machine learning techniques to uncover patterns.
- Interpretation – Translating analytical findings into actionable business insights.

Gandomi and Haider (2015) outline several analytical techniques applicable to both structured and unstructured data. Text analytics (text mining) extracts relevant insights from textual data, such as emails, blogs, survey responses, and documents, to improve decision-making. Key techniques include:

- Information Extraction (IE) – Converts unstructured text into structured datasets by identifying key terms. For example, extracting drug names, dosages, and frequencies from medical prescriptions.
- Text Summarization (TS) – Creates concise summaries using:
    - Extractive Method – Selects and combines key sentences without modification (fast but less fluid).
    - Abstractive Method – Rewrites content with new wording for coherence (requires advanced NLP techniques).
- Question Answering (QA) – Uses Natural Language Processing (NLP) to respond to user queries by searching large datasets.
- Sentiment Analysis (Opinion Mining) – Categorizes text as positive, negative, or neutral using NLP and machine learning. Additional sentiment categories can be included based on specific objectives.

Audio analytics processes spoken language and sound for various applications, including:

- Speech Recognition – Converts spoken words into text.
- Speaker Identification and Verification – Identifies or authenticates speakers.
- Emotion and Sentiment Analysis – Detects emotions in speech to assess customer sentiment.
- Text-to-Speech Conversion – Converts written text into spoken language.

Applications: security & surveillance, customer service & call centers, smart homes & IoT, education & e-learning.

Video analytics extracts insights from video footage using:

- Motion Detection – Identifies movement patterns.
- Object Detection & Tracking – Recognizes and follows objects in real time.
- Facial Recognition – Identifies individuals using facial features.

Applications: security & surveillance, traffic management, smart cities.

Social media analytics extracts insights from online interactions to understand customer behavior and industry trends. Key techniques include:

- Sentiment Analysis – Measures emotional tone in social media posts.
- Topic Modeling & Trend Analysis – Detects emerging discussions and viral topics.
- Text & Hashtag Analysis – Identifies key themes and trends in user-generated content.

Benefits to organizations: real-time customer feedback analysis, influencer marketing insights, lead generation through targeted campaigns

Predictive analytics forecasts future outcomes by analyzing historical and real-time data. Techniques include:

- Moving Averages – Identifies trends over time.
- Linear Regression Models – Establishes causal relationships between dependent and independent variables.

Organizations leverage predictive analytics to enhance decision-making, optimize business strategies, and anticipate market shifts.

DATA ANALYTICS CURRICULA IN ACCOUNTING

1. Evolution of Data Analytics in Accounting Curricula

Traditionally, accountants have processed transactions using paper ledgers to generate structured accounting data. However, with advancements in information technology, the volume and variety of big data have grown exponentially, with structured data (e.g., accounting records) now representing less than 5% of all available data. As a result, accounting curricula must evolve to include knowledge, skills, and abilities (KSAs) related to big data and analytics, ensuring that graduates possess the competencies required by the industry.

There is a high demand for accounting professionals who can apply the scientific method to solve business problems. This involves:

- Identifying relevant research questions and theories
- Developing effective research methodologies
- Collecting and analyzing structured and unstructured data
- Generating data-driven solutions
- Communicating findings effectively to decision-makers (Ballou, Heitger, and Stoel, 2018)

Furthermore, accounting graduates must be able to extract insights from unstructured data sources—such as emails, social media, and financial reports—to enhance decision-making quality. In this evolving role, accountants are no longer confined to traditional accounting functions but should serve as information coordinators across various organizational departments (Swanson, 2020).

1.a. The Growing Role of Data Analytics in Accounting Education

Many academic institutions have integrated analytics learning outcomes into accounting curricula, recognizing the increasing importance of data analytics. Key drivers of this transformation include:

- AACSB Accreditation Standards – Require accounting programs to ensure faculty and students are proficient in current and emerging technologies.

- Revised CPA Exam Format – Introduced the Information Systems and Controls (ISC) section to assess a CPA's technological competence.
- Consensus Among Accounting Faculty – Widespread agreement that data analytics should be a core component of accounting education.

Additionally, AACSB-accredited business schools emphasize data analytics in accounting curricula more than non-AACSB-accredited institutions (Salimi, 2023). However, integrating big data analytics into accounting education requires significant resources, such as:

- Hiring new faculty with expertise in data analytics
- Training existing faculty in data analytics tools and methodologies
- Gaining access to big data sources and analytics software

Nevertheless, AACSB-accredited schools are more likely to incorporate data analytics into their accounting programs due to their greater access to resources.

1.b. Approaches to Integrating Data Analytics in Accounting Curricula

Accounting programs have three primary options for incorporating big data and analytics into their curricula (Dzuranin, Jones, and Olvera, 2018):

- Developing Standalone Accounting Data Analytics Courses – Offering dedicated courses focusing on data analytics concepts, tools, and applications in accounting.
- Integrating Data Analytics Across Existing Accounting Courses – Embedding analytics concepts within traditional accounting subjects (e.g., financial accounting, auditing, taxation).
- Combining Both Approaches – Implementing a hybrid model that includes dedicated courses and embedded analytics components in existing courses.

To remain relevant in an increasingly data-driven industry, accounting programs may adopt one of these approaches, ensuring that graduates are well-prepared for the modern accounting landscape.

1.b.1. Standalone Approach

Tapis and Priya (2020) developed a survey questionnaire to assess students' knowledge, skills, and abilities (KSAs) in data analytics courses, aligning with the two primary learning outcomes emphasized in Standard A5 of AACSB International: agility and adaptability.

- Agility refers to students' ability to master specific software or techniques and then transfer their skills to similar tools with minimal effort (Vein, 2018).
- Adaptability reflects students' readiness to keep pace with technological advancements and adjust to changes in disruptive environments.

To measure these competencies, Tapis and Priya (2020) structured their survey into three components:

- Openness to experience (a proxy for adaptability, measured using the Big Five Personality Inventory)
- Task-specific self-efficacy
- Self-confidence

Students enrolled in the data analytics course completed the survey twice—at the beginning and end of the semester. The collected data was analyzed statistically to measure changes in agility and adaptability, indicating the course's effectiveness in achieving learning outcomes. Tapis and Priya (2020) propose that an Accounting Information Systems (AIS) course should be a prerequisite for Data Analytics courses. This ensures that students have a foundational understanding of how data is generated and flows through the information lifecycle in accounting systems. Coyne, Coyne, and Walker (2016) further stress that accountants must understand the data relevant to their tasks; otherwise, they cannot effectively collect and use data as inputs for decision-making models. Similarly, Qasim, Issa, Refae, and Sannella (2020) identify three primary learning activities in AIS courses that prepare students for data analytics: predictive modeling, artificial intelligence, and robotic process automation. They also recommend data analytics tools for AIS courses, including Access, Excel, Alteryx, Tableau Prep, and UiPath.

On the other hand, Kennedy and Stratopoulos (2024) discuss the adoption of five data analytics and emerging technologies (DA&ET) courses in the accounting program at the University of Waterloo in Canada (p. 2):

- Business Analytics I: Introduction to Data Analytics Process
- Business Analytics II: Introduction to Statistics
- Business Analytics III: Communication Using Dashboards and Storytelling
- Business Analytics IV: Foundation of Accounting & Finance Analytics
- Business Analytics V: Emerging Technologies in Business

Accounting students take these five courses in their first two years while taking related courses in accounting, business, and economics courses in parallel. For example, during the first semester of the first year, students take the Business Analytics I course coupled with other introductory courses in accounting, business, and economics. Then, the Business Analytics I course adopts cases to address and extend the subjects discussed in these courses by presenting data-driven solutions. For example, students in the Business Analytics I course learn to collect data and analyze gross profits based on variables, such as sales and cost of goods sold, addressed in other courses to reinforce their understanding of these concepts using real-world data.

Kennedy and Stratopoulos (2024) suggest four levels of data analytics integration: Light, Medium, Advanced, and Waterloo. The light level could adopt the first two courses, Business Analytics I and II, in addition to the AIS course. The Medium and Advanced Levels may adopt the first three and four courses, respectively, depending on how extensively the accounting program plans to integrate data analytics. Nonetheless, the University of Waterloo model may not be practical for most accounting programs in the US that have no room to add multiple data analytics courses unless existing courses are removed.

1.b.2. Standalone Data Analytics Certificate Program

An alternative approach to integrating data analytics into business education is the Data Analytics Certificate Program developed by Clayton and Clopton (2019). This program allows business students to leverage massive datasets in daily decision-making.

The certificate program consists of four courses:

- Introduction to Data Analytics
- Principles of Data Communication and Visualization
- Applications of Data Analytics
- Analytics Capstone

Key modifications to the business curriculum:

- The first three courses replace existing business courses, ensuring that business majors develop big data and analytics competencies.
- The capstone course is not part of the core business curriculum but is required to earn the data analytics certificate.
- The program is open to all students across the university.

This model ensures that students gain relevant analytics skills without overcrowding the curriculum.

Challenges of the Standalone Approach:
While dedicated data analytics courses can enhance accounting education, two main challenges exist. First, data analytics is a relatively new field in accounting, making it difficult to recruit qualified faculty with expertise in accounting and data analytics. Second, most accounting programs lack the flexibility to add additional courses due to existing CPA exam requirements. For example, the Texas State Board of Public Accountancy (TSBPA) mandates that CPA applicants must complete:

- 21 semester hours of upper-level accounting courses to sit for the CPA exam
- Six additional semester hours of upper-level accounting coursework for CPA certification
- A TSBPA-approved three-semester-hour ethics course

As a result, accounting programs have limited room to introduce standalone data analytics courses unless they remove or restructure existing courses.

In summary, the standalone approach to data analytics education has advantages—it allows for focused instruction, the use of specialized faculty, and the development of in-depth analytics skills. However, faculty shortages and curriculum constraints present significant barriers. Universities considering this approach must evaluate whether they can accommodate additional courses or explore alternative solutions, such as integrating analytics into existing accounting courses.

1.b.3. Integrating Data Analytics in Accounting Curriculum

Qasim et al. (2020) advocate for integrating data analytics into the accounting curriculum rather than developing a standalone data analytics course for two primary reasons:

- Limited curriculum space – Most accounting programs do not have room to add data analytics courses (Appelbaum, Kogan, and Vasarhelyi, 2017).
- Multifaceted nature of data analytics learning – Beyond technical skills, students need to develop an analytical mindset, interpret insights, and communicate findings effectively (Dzuranin et al., 2018).

Qasim et al. (2020) argue that an integrated approach allows data analytics to be gradually embedded within accounting courses, ensuring students acquire the necessary skills to make data-driven business decisions. Moreover, this approach eliminates the need to add a new course to the accounting curriculum.

1.b.3.a. Two Models for Integrating Data Analytics in Accounting

Qasim et al. (2020) propose two models for incorporating data analytics into accounting education:

- Integration by Study Level – A progressive learning approach across three levels: introductory, intermediate, and advanced.
- Integration by Course – Embedding data analytics tools and techniques into specific accounting courses.

Integration by Study Level

Data analytics is introduced progressively in accounting programs as shown in Figure 1:

- Introductory Level – Students learn why data analytics matters in accounting and apply spreadsheet software (e.g., Excel) to basic tasks such as calculating depreciation or preparing financial statements.
- Intermediate Level – Students are introduced to data preparation, extraction, transformation, and loading (ETL) using tools like Tableau, Alteryx, Excel, Power BI, and QlikView. They apply advanced analytics techniques to financial statement analysis and cost accounting using software such as IDEA CaseWare, SAS, R, and Python.
- Advanced Level – In upper-level accounting courses, students learn to adapt enterprise accounting procedures and use data analytics and AI to interpret and predict financial results. Additionally, they focus on communicating their analytical findings effectively to stakeholders.

Integration by Course

Qasim et al. (2020) outline a course-sequenced model to embed data analytics into existing accounting courses. This model ensures that courses maintain their core learning objectives while incorporating relevant case studies and projects focused on data analytics.

They identify six key course groups for integration: Introduction to Financial Accounting, Introduction to Managerial Accounting & Cost Accounting, Intermediate Accounting I & II, Accounting Information Systems, Auditing, and Financial Statement Analysis as shown in Figure 2.

Figure 1: Integration of Data Analytics by Study Level

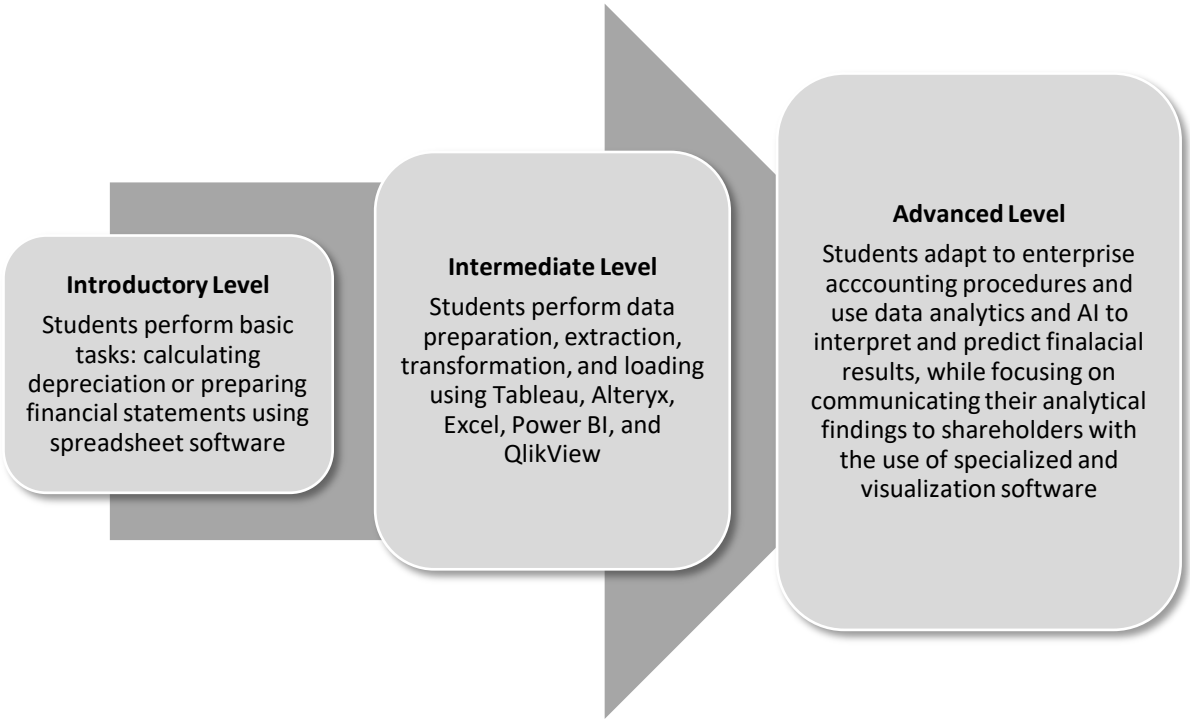
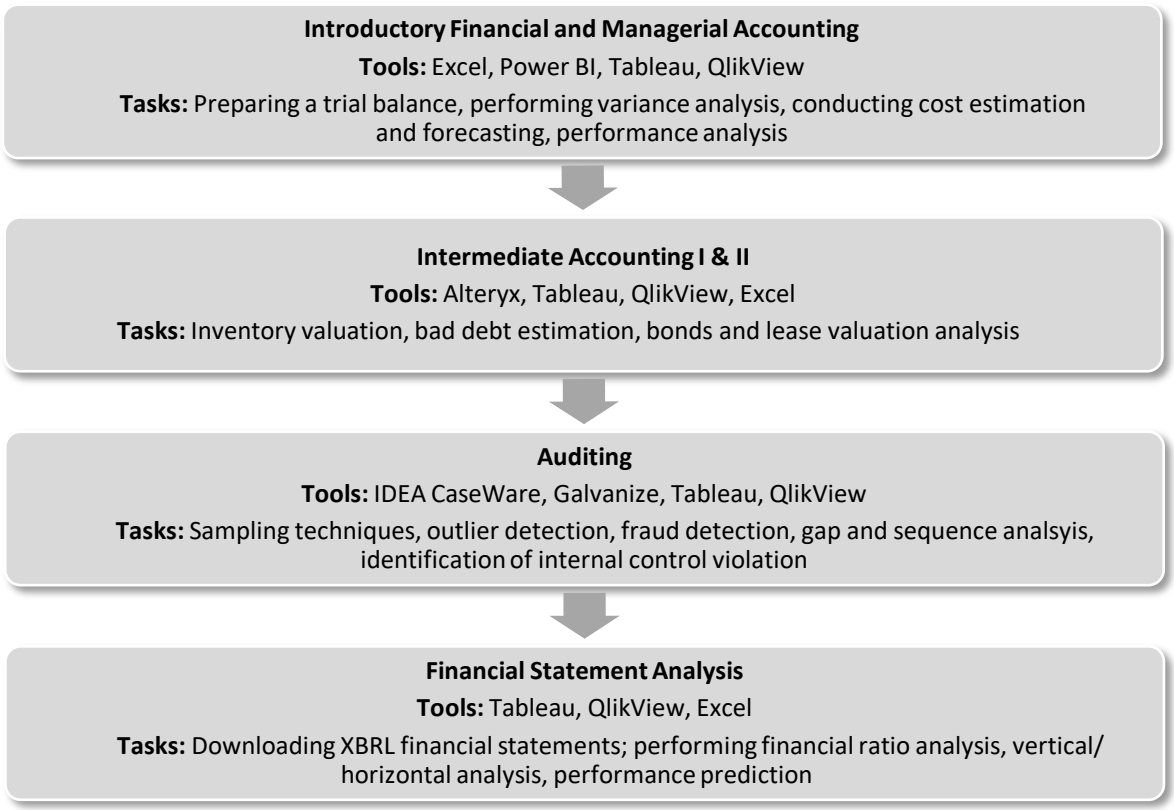


Figure 2: Integration of Data Analytics by Course



Introductory Courses: Financial and Managerial Accounting:

- Utilize spreadsheet and visualization tools (e.g., Excel, Power BI, Tableau, QlikView) to teach fundamental data analytics tasks such as:
    - Preparing a trial balance
    - Performing variance analysis
    - Conducting cost estimation & performance analysis
    - Traditional manual accounting exercises (pen and paper) are replaced with data-driven applications using relevant software.

Intermediate Accounting I & II courses:

- Focuses on mastering GAAP for financial statement preparation.
- Students use Alteryx, Tableau, QlikView, Excel, and other tools for data-driven assignments such as: inventory valuation methods, bad debt estimation, lease valuation analysis, etc.
- Challenges:
    - Heavy workload for students – Intermediate accounting courses already require significant effort to master GAAP, the key component of the CPA exam.
    - Risk of over-reliance on software – Students may struggle to fully understand accounting principles if software automates financial calculations, diminishing their conceptual learning.

Auditing Course:

- Advanced data analytics tools such as IDEA CaseWare, Galvanize, Tableau, and QlikView are introduced.
- Students practice sampling techniques, outlier detection, fraud detection using Benford's law, gap and sequence analysis, identification of internal control violation
- Challenges:
    - The audit course already has an overloaded syllabus, as it is typically the only undergraduate course covering auditing and assurance concepts.
    - Instructors may need to replace traditional competencies with data analytics-focused skills to maintain balance

Financial Statement Analysis Course:

- Integrated with data analytics techniques, but its selection remains unclear without presenting relevant data analytics tools to support financial statement analysis. Tools include Tableau, QlikView and Excel
- Students download XBRL financial statements and also perform financial ratio analysis, vertical/horizontal analysis and performance prediction
- Instead, other core accounting courses—such as Federal Income Tax, Advanced Accounting, or Fund Accounting—could incorporate unique data analytics applications.

Challenges of the Integrated Approach:

- Lack of centralized oversight – Who ensures students develop a cohesive data analytics skill set across courses?
- Instructor engagement – Faculty may view data analytics as a minor component within their course rather than a key learning outcome.
- Faculty training requirements – Accounting instructors must be motivated and trained to integrate data analytics effectively.

In summary, the integrated approach enables students to progressively develop data analytics skills within existing accounting courses without expanding the curriculum. However, successful implementation requires:

- A clear oversight mechanism to track students' cumulative data analytics competencies.
- Faculty training and motivation to ensure instructors effectively incorporate analytics into their courses.
- Strategic course selection to ensure data analytics is integrated into the most relevant accounting subjects.

The standalone and integrated approaches have unique advantages and limitations, and accounting programs must evaluate their curriculum structure to determine the most effective implementation strategy.

Hybrid Approach for Integrating Data Analytics into Accounting Curricula

The hybrid approach presents a practical and structured method for integrating data analytics into accounting curricula. In this model, an accounting data analytics instructor is the lead instructor, ensuring that learning outcomes are effectively incorporated across various accounting courses. This approach ensures that accounting students develop data analytics competencies while maintaining the core accounting knowledge required for their profession.

Survey findings support the hybrid model:

- 69% of accounting faculty prefer the hybrid approach over a standalone data analytics course (Dzuranin, Jones, and Olvera, 2018).
- Nearly 90% recommend incorporating data analytics into Accounting Information Systems (AIS) and Auditing courses.
- 60% believe that data analytics should be included only in AIS, Auditing, and standalone data analytics courses, rather than being spread across the entire accounting curriculum (Ballou, Heitger, and Stoel, 2018; Dzuranin et al., 2018; Dow, Jacknis, & Watson, 2021).

However, many accounting programs struggle to hire qualified faculty who can serve as lead instructors to oversee data analytics integration (Andiola, Masters and Norman, 2020). The scarcity of faculty with both accounting and data analytics expertise poses a significant challenge to implementing the hybrid approach effectively.

Dow et al. (2021) apply the Diffusion of Innovation Theory to propose a five-stage framework for successfully integrating data analytics into accounting education:

- Knowledge/Awareness – Instructors gain an understanding of data analytics and its relevance to accounting education, recognizing the increasing market demand for analytics skills and the importance of accreditation requirements, such as technology agility.
- Persuasion – Instructors evaluate the benefits and challenges of incorporating data analytics into their courses.
- Decision – Faculty determine how to integrate analytics concepts while balancing traditional accounting learning objectives.
- Implementation – Data analytics content is gradually introduced into accounting courses by following three steps below.
- Confirmation/Continuation – The program continuously improves, incorporating emerging tools and industry trends.

Three steps in the implementation stage.

Step 1: Integrating Data Analytics into the AIS Course

Dow et al. (2021) propose that AIS is the best entry point for data analytics, as this course traditionally teaches technology tools such as Excel, Access, and ERP systems. AIS instructors are also more likely to continuously update technologies in their courses. Example: The instructor may introduce Excel's Analysis ToolPak for students to perform standard descriptive and inferential statistics, such as:

- Mean, median, variance
- t-Test and regression
- ANOVA and MANOVA

The AIS course thus provides foundational data analytics skills, preparing students for more advanced analytics applications in upper-level accounting courses.

Step 2: Expanding Data Analytics Across Accounting Courses

After completing the AIS course, students should be exposed to practical data analytics applications in other accounting subdisciplines. Dow et al. (2021) present two options for this step:

Option 1: Developing a Standalone Data Analytics Course

- A dedicated data analytics course is introduced.
- The lead instructor collaborates with subdiscipline instructors to develop course-specific analytics modules (e.g., audit, tax, financial accounting, managerial accounting).

- During the semester, subdiscipline instructors join the lead instructor in delivering their respective data analytics modules.
- Over time, these learning modules are continuously updated and shared among faculty for improvement.
- Potential challenges:
    - Not all programs can add a new course due to credit-hour limitations.
    - Faculty shortages may limit the availability of qualified instructors.

Option 2: Embedding Data Analytics Within Existing Accounting Courses

- Data analytics topics are integrated into each accounting course under the guidance of a lead instructor.
- The AIS instructor may assume the role of lead instructor if a dedicated data analytics faculty member is unavailable.
- Subdiscipline instructors receive support and training in developing course materials.
- Cross-disciplinary collaboration with faculty from MIS, computer science, and other fields may provide additional expertise.
- Key Benefit: Faculty need not be data analytics experts but should feel comfortable incorporating analytics concepts with support from other faculty and training programs.

Step 3: Establishing a Data Analytics-Infused Accounting Curriculum

- The accounting curriculum is fully revised to integrate data analytics into all relevant courses.
- Faculty continuously update course content to align with industry trends and new technologies.
- Accounting programs engage with professionals to ensure students are trained in the latest data analytics tools.
- Introduction of data analytics courses tailored to address unique issues in subdisciplines, provided the accounting program has resources to support them.

The hybrid approach offers a balanced solution for integrating data analytics into accounting curricula. However, successful implementation requires:

- A clear leadership structure to oversee data analytics learning outcomes.
- Faculty engagement and support to ensure instructors effectively incorporate analytics into courses.
- Continuous updates and collaboration with industry experts to stay ahead of evolving trends.

Both the standalone and integrated models have strengths and challenges. Accounting programs must assess their curricular flexibility, faculty expertise, and resource availability to determine the most effective approach for preparing students for a data-driven accounting profession.

CONCLUDING REMARKS

The rise of big data has reshaped the accounting profession, emphasizing the need for accountants to process structured and unstructured data, extract meaningful insights, and enhance strategic decision-making. Professional accounting organizations have updated certification requirements, such as CPA and CMA, to include data analytics proficiency. Similarly, AACSB has reinforced its commitment to aligning accounting education with technological advancements in the industry.

As universities play a crucial role in equipping graduates with the skills employers demand, this paper explores three approaches to integrating data analytics into accounting curricula: standalone, integrated, and hybrid. The standalone approach involves hiring dedicated faculty to lead data analytics courses, ensuring a structured transition but facing challenges such as faculty shortages and curriculum constraints. The integrated approach weaves data analytics into existing courses, minimizing the need for additional faculty but risking insufficient coverage due to competing learning objectives.

Recognizing these challenges, most surveyed accounting professors support the hybrid approach, where a lead instructor serves as a resource to assist faculty in embedding data analytics into their courses. As businesses increasingly rely on real-time data insights, accounting programs must prepare graduates to embrace technological advancements and remain competitive in a data-driven world.

Lastly, research focusing on the integration of new technologies into accounting curricula is still in its early stage and further work is needed to explore the impact of other significant technological advancements. For instance, Artificial Intelligence (AI) is another influential technological development in recent years and rapidly transforming the accounting profession. While this paper focuses on big data and data analytics, future studies could explore how AI technologies—such as machine learning, natural language processing, and robotic process automation—are reshaping the knowledge and skills needed by accounting graduates. Integrating AI literacy into the accounting curriculum may help students better interpret AI-generated insights and address emerging ethical and professional challenges in technology-driven environments.

REFERENCES

Andiola, L. M., Masters, E., & Norman, C. (2020). Integrating technology and data analytics skills into the accounting curriculum: Accounting department leaders' experience and insights. *Journal of Accounting Education*, 50, 100650.

Appelbaum, D. A., Kogan, A., & Vasarhelyi, M. A. (2017). Big data and analytics in the modern audit engagement: Research method. *Auditing: A Journal of Practices & Theory*, 36(4), 1-27.

Association to Advance Collegiate Schools of Business (AACSB). 2024a. 2020 Guiding Principles and Standards for Business Accreditation. Available at https://www.aacsb.edu/-/media/documents/accreditation/_2020-aacsb-business-accreditation-standards-_final--july-1-2024.pdf? rev=91a715d3f85043d9ac8b3007cf942e44&hash=139EAD863BEA1DC02C1C386FD2CEF297

Association to Advance Collegiate Schools of Business (AACSB). 2024b. 2018 Standards for Accounting Accreditation. Available at https://www.aacsb.edu/-/media/documents/accreditation/accounting/standards-and-tables/accounting2018standards_july-1-2024_finl.pdf?re v=0df476c595744b5492cdabcef8d668dc&hash=50C6B37A580C024DAD9CE89B83FCEB31

Baldwin, J. N., Hurtt, K., & Hurtt, D. (2023). What changes are coming to the 2024 CPA exam? *Today Society of CPAS*, 19-23.

Ballou, B., Heitger, D. L., & Stoel, D. (2018). Data-driven decision-making and its impact on accounting undergraduate curriculum. *Journal of Accounting Education*, 44, 14-24.

Clayton, P. R. & Clopton, J. (2019). Business curriculum redesign: Integrating data analytics. *Journal of Education for Business*, 94 (1), 57-63.

Coyne, J. G., Coyne, E. M., & Walker, K. B. (2016). A model to update accounting curricula for emerging technologies. *Journal of Emerging Technologies in Accounting*, 13(1), 161-169.

Cukier, W. (2010). Data, data everywhere. *The Economist*. Retrieved from https://www.economist.com/special-report/2010/02/27/data-data-everywhere, December 15, 2024

Dow, K. E., Jacknis, N., & Watson, M. W. (2021). A framework and resources to create a data analytics-infused accounting curriculum. *Issues in Accounting Education*, 36 (4), 183-205.

Dzuranin, A. C., Jones, J. R., & Olvera, R. M. (2018). Infusing data analytics into the accounting curriculum: A framework and insights from faculty. *Journal of Accounting Education*, 24-39.

Faccia, A. & Petratos, P. (2024). Big data applications in accounting information systems. 9th International Conference on Big Data and Computing (ICBDC 2024), May 24-26, 2024, Bangkok, Thailand.

Gamage, P. (2016). Big data: are accounting educators ready? *Accounting and Management Information Systems*, 15(3), 588-604.

Gandomi, A. & Haider, M. (2015). Beyond the hype: Big data concepts, methods, and analytics. *International Journal of Information Management*, 35, 137-144.

IMA (Institute of Management Accountants) downloaded from https://www.imanet.org/en/IMA-Certifications/CMA-Certification November 8, 2024

Kennedy, D. B. & Stratopoulos, T. C. (2024). How to implement a data analytics and emerging technologies-enabled accounting curriculum. *Journal of Emerging Technologies in Accounting*, 1-19, from DOI: 10.2308/JETA-2023-040.

Laney, D. (2001). 3D data management: Controlling data volume, velocity and variety. *META group research note* 6 (70):1.

Manyika, J., Chui, M., Brown, B., Bughin, J., Dobbs, R., Roxburgh, C., & Byers, A. H. (2011). Big data: the next frontier for innovation, competition, and productivity. Washington, DC: McKinsey & Company.

Pathways Commission. (2013). Implementing Recommendation for the Future of Accounting Education: The First Year Update. Retrieved November 30, 2024, from https://aaahq.org/portals/0/images/education/pathways/8-9-51009.pdf?ver=2021-02-23-180244-967

Pincus, K. V., Stout, D. E., Sorensen, J. E., Stocks, K. D., & Lawson, R. A. (2017). Forces for change in higher education and implications for the accounting academy. *Journal of Accounting Education*, 40, 1-18.

Qasim, A., Issa, H., Refae, G. A. E., & Sannella, A. J. (2020). A model to integrate data analytics in the undergraduate accounting curriculum. *Journal of Emerging Technologies in Accounting*, 17(2), 31-44.

Ridsdale, C., Rothwell, J., Smit, M., Ali-Hassan, H., Bliemel, M., Kelley, D., Matwin, S., & Wuetherick, B. (2015). Strategies and best practices for data literacy education: knowledge synthesis report. Dalhousie University, Canada.

Salimi, A. Y. (2023). Inclusion of data analytics in the accounting curriculum. *Journal of Business and Education Leadership*, 13(1).

Swanson, E. B. (2020). How information systems came to rule the world: Reflections on the information systems field. *The Information Society*, 36(2), 109-123.

Tapis, G. P. & Priya, K. (2020). Developing and assessing data analytics courses: A continuous proposal for responding to AACSB Standard A5. *Journal of Emerging Technologies in Accounting*, 17(1), 133-141.

US Department of Commerce. (2019). NIST Big Data Interoperability Framework: Volume 1 Definitions. *NIST Special Publication 1500-1r2*.

Vein, C. (2018). What to know about AACSB Accounting Standard A5. *Journal of Accountancy*. December 11. Available at https://www.journalofaccountancy.com/newsletters/extra-credit/aacsb-accounting-standard-a5.html

Vesset, D., Olofson, C. W., Schubmehl, D., McDonough, B., Woodward, A., Stires, C., Fleming, M., Nad-karni, A., Zaidi, A., & Dialani, M. (2014). IDC FutureScape: Worldwide Big Data and Analytics 2015 Predictions [report]. International Data Corporation.

What? I Need To Read Before Class? A Post-Pandemic Understanding of Undergraduate Student Mindset and Class Preparation

Kathleen Pinson, Georgia Gwinnett College (Retired) - Lawrenceville, Georgia, USA
Janita Rawls, Ph.D., Georgia Gwinnett College - Lawrenceville, Georgia, USA

ABSTRACT

Have you ever wondered what your undergraduate students are thinking as they come to class? Or, if they have read the material and are prepared to discuss it? This paper focuses on student mindset and class preparation for undergraduate students since the pandemic, and the general research question is: 1) How are students preparing to learn? Specifically, the authors are researching what are students' thoughts and behaviors related to their learning process.

Survey results capture student preferences and ideas regarding their favorite class. The manuscript presents quantitative research findings. The research results indicate that nearly half (46%) of the survey participants stated they came to class very often with a mindset of what they need to learn. When the somewhat often results are added, that percentage jumps to 81%. However, respondents simply want to be told what to do to get a passing grade (44% very often and somewhat often categories and nearly 77% when the sometimes group is added). As noted in the statistics above, results portray a learning gap in the respondents' preparation for learning. This discussion concludes with a summary of teaching practices a professor can utilize to increase a focused classroom environment and encourage development of student interest and deeper learning in daily class sessions.

Keywords: mindset, curiosity, undergraduate student preparation, student interest, and self-determination theory.

INTRODUCTION

As a professor in either face to face or synchronous online courses, one meets their students for each class session with the anticipation that lives will be transformed or, at least, somewhat changed. Faculty members are passionate about student learning, especially in their disciplines. Sometimes classes go well and sometimes not so well. The idea that one person, the faculty member, can hold the attention and teach to a multitude of people stretches the boundaries of human connectivity, but that is what dedicated faculty members try to achieve.

Anecdotally, one hears faculty colleagues talking amongst themselves declaring that post-pandemic students are different than pre-pandemic students. Often, we find that students are prepared to discussed the material and sometimes not so much. How would we modify our classes if we knew what students are thinking or their level of preparation? The aim of this study was to understand the post-pandemic preparation and mindset of students in an undergraduate business classroom, as there are few research studies in U.S. higher education after the 2020 pandemic in this area. Since the events of COVID 19 changed how students interact with their higher educational experience, this research is important because it provides student perceptions of their preparation, preferences, and engagement after most institutions closed for the pandemic. Thus, the data is relevant and necessary to understand students' approach to daily coursework so faculty can better meet their needs. The research question posed was: *What are the experiences and preferences of our students as they prepare for class and are experiencing class.* The more we understand students' understanding, motivation, preparation, and interaction with the material, the better faculty members will be able to teach and design an environment to support student learning.

THEORETICAL FRAMEWORK

This research project applied self-determination theory as its theoretical framework which links human need to social context to inherent tendencies. The fundamental ideas of self-determination theory are that individuals are "inherently active, intrinsically motivated, and oriented toward developing naturally through integrative processes…. they develop over time, play a central role in learning, and are affected by social environments." (Deci & Ryan, 2011, p. 417). Ryan and Deci (2000) researched individual growth and development through the lens of intrinsic motivation due to the nature of it being "also an important motivator of the learning, adaptation, and growth in competencies that

characterize human development" (p. 43). Intrinsic motivation is important to this theory, but they also recognize the use of extrinsic motivation in certain situations. Deci and Ryan (2011) further noted that both intrinsic and extrinsic motivation are based on three universal needs: 1) relatedness (is there a sense of connection to others), 2) competence (will the individual achieve understanding within a supportive context) and 3) autonomy (will behavioral choices be available to the individual) (p. 417). In Ryan and Deci's (2018) book*, Self-determination Theory*, they conclude that activities which support or do not support these three needs will influence an individual's actions and thus development. Within the context of this research study, the concept of intrinsic motivation is utilized through the lens of interest. Based on the Self-determination Theory, students who possess higher levels of intrinsic motivation, and thus interest in the topic, will take the time to be active in their preparation, pursuit of learning, and with the mindset for learning.

LITERATURE REVIEW

Student motivation and engagement in higher education have been well researched from a variety of perspectives: (*metamotivation theories,* Yu, Zhang, & Nunes (2023*); teacher-student rapport,* Bardorfer & Dolenc (2022*); building relationships,* Leenknecht, Snijders, Wijnia, Rikers, & Loyens (2023*); sustaining engagement and interest,* Larson (2014*); first impresssions,* LaPiene, Pettijohn II, & Palm (2022*); the role of a calling,* Lavine & Blankenship (2022); *cooperative learning*, Tran (2019); *gamification,* Rebelo & Isaías (2020); *test taking and engagement,* Satkus & Finney (2021); *online learning,* Kim, Notts, & Albers, (2021); *effects of e-learning,* Elshareif & Mohamed (2021); *virtual learning environments,* Beluce, C., de Oliveira, A., Luciane, K., Carvalho, A. Rua, B., Grosso, M, Beluce, A. C., & de Oliveira, K. L (2015), etc.) . Motivation involves interest and curiosity (cognitive aspects) as well and the engagement (behavioral aspects) by the student. Dewey (1900) wrote about the importance of utilizing an individual's interest and combining that with experience and structure in a learning environment. These concepts are foundational to learning, and a student's preparation and mindset begin with interest in the course's subject matter. Interest becomes crucial when students attempt to engage in the course material.

Interest

Renninger and Hidi (2016) stated that interest is powerful and produces "productive engagement and the potential for optimal motivation" (p. 1). Interest can only be activated when a student is, at some level, curious. Deci and Ryan (1985) argue that "curiosity is a basic propensity in human functioning. The desire to explore, discover, understand, and know is intrinsic to people's nature and is a potentially central motivator of the educational process" (p. 245). Additionally, Deci and Ryan (1985) frame curiosity within the understanding of intrinsic motivation, as noted:

> Intrinsic motivation is the innate, natural propensity to engage one's interests and exercise one's capacities, and in so doing, to seek and conquer optimal challenges. Such motivation emerges spontaneously from internal tendencies and can motivate behavior even without the aid of extrinsic rewards or environmental controls. Intrinsic motivation is also an important motivator of the learning, adaptation, and growth in competencies that characterize human development. (p. 43)

In his book, Curiosity, Leslie (2014), states "that curious learners go deep and they go wide. They are the people best equipped for the kind of knowledge-rich cognitively challenging work required …. They are also the ones most likely to make creative connections between different fields of the kind that lead to new ideas the ones best suited to working in multidisciplinary teams." (p.xvi). Leslie (2014) divides curiosity into three areas 1) diversive, 2) epistemic, and 3) emphatic, and this research focuses on the first two types. Leslie (2014) defines diversive curiosity as the "attraction to everything novel" and explains this type of curiosity must be honed and fed with deeper knowledge which he calls epistemic (p. xx) "Diversive curiosity is where the hunt for knowledge begins in the desire for new information, sensations, experiences and challenges" (Leslie, 2014, p.7). Thus, diversive curiosity is good, but needs to develop into epistemic to be of value to the individual. This development into epistemic curiosity is more difficult as it "involves sustained cognitive effort" (Leslie, 2014, p.11). Both diversive and epistemic curiosity are "active" parts to learning.

Questioning "is an incredibly important engine for cognitive development" and the basis to begin one's curiosity search (Leslie, 2014, p. 28). Leslie (2014) breaks down questions into three processes: 1) "you have to know that you don't know, 2) you have to be able to imagine different, competing possibilities and 3) you have to understand that you can learn from other people" (p.29-30). Thus, the questions about the wider world become important to begin the curiosity journey from diversive to epistemic realms. In order to begin questioning, the notion of an informational gap becomes crucial (Leslie, 2014). This gap "fuels curiosity by creating awareness of ignorance which gives rise to

a desire to know more" (Leslie, 2014, p.36). Thus, the question or the gap provides a source of motivation for learning more about a subject and helps in framing additional questions. There is a sense of urgency, of some degree, to answer the question and bring closure to close this gap.

Sinek (2009) asserts questioning should arise in a particular format. Sinek (2009) argues inspirational motivation, rather than manipulating motivation, needs to start with asking the question, WHY, working from the inside out of his three-phase circle—WHY, HOW, and WHAT. Sinek (2009) defines WHY as "one's purpose, cause, or belief" (p.39). WHY is mostly likely, according to Sinek (2009), the unanswered question or the "gap" in addressing inspirational motivation. He believes "we rarely say WHY we do WHAT we do" (Sinek, 2009, p.39). The "WHY must come first. The WHY provides the context for everything else" (Sinek, 2009, p. 70). This WHY is important for students since many may not be able to see the gap on their own.

The questioning process supports interest development. Interest, according to Renninger and Hidi (2016), "is characterized by increased attention, effort, concentration, and affect during engagement," and it has four different phases of development (p.9). The phases are: 1) Triggered situational interest, 2) Maintained situational interest, 3) Emerging individual interest as students switch to self-directed learning, and 4) Well-development individual interest (Renninger & Hidi, 2016). The scope of this research will be to explore only their first phase, which they define as the "psychological state resulting from short-term changes in cognitive and affective processing associated with a particular class of content" (Renninger & Hidi, 2016, p. 13). Interest has two different meanings and are interrelated--there is a psychological state (a trigger) and a motivational disposition (actions).

Learning and Rewards: Intrinsic, Extrinsic, and Amotivation

A discussion about student motivation and engagement is not complete without a discussion about learning and rewards from intrinsic, extrinsic, and amotivational perspectives. Ideally, faculty members want all students to be completely intrinsically motivated. This might be the case in students' favorite classes or ones where they feel a connection to the material. However, more often than not, students may not be interested/motivated in a class session. Amotivation refers to a learner who is has no desire externally or internally to act (Deci & Ryan, 1985). On the opposite side of the motivational continuum, there is intrinsic motivation. Deci and Ryan (1985) note that "When conditions are created that facilitate intrinsic motivation, students' learning, particularly conceptual learning and creative thinking, increases dramatically relative to that of students in settings that foster extrinsically oriented learning" (p. 261). Conceptual learning, as described above, is the opposite of rote learning, which is procedural in nature. Extrinsic motivation is action derived from an external stimulus and can erode intrinsic behavior (Deci and Ryan, 1985). Intrinsic and extrinsic motivation relate to the self-determining aspects of Deci and Ryan's (1985) theory as noted

> Events that lead to an external perceived locus of causality and undermine intrinsic motivation are those that deny one self-determination, whereas events that lead to an internal perceived locus of causality and enhance intrinsic motivation are those that facilitate self-determination. We often say that the former events control behavior, whereas that the latter events support autonomy. (p.65)

Mindset

Curiosity, interest, and motivation are cognitive processes which precipitate action or inaction. These concepts are fundamental to Dweck's (2006) ideas in *Mindset, The New Psychology of Success*. Dweck (2006) presents two opposing views of learning behavior--the Growth and Fixed mindsets. The critical piece for these two mindsets lies with the notion of how students interact with their learning environment. "When students view intelligence as fixed, they tend to value looking smart above all else. They may sacrifice important opportunities to learn …..Students with a growth mindset, on the other hand, view challenging work as an opportunities to learn and grow" (Dweck, 2010, p. 16). Thus, the behaviors toward learning are directly impacted by the perceptions of learning one possesses. Specifically, "Fixed Mindsets have a tendency to avoid challenges, give up easily, see effort as fruitless or worse, and ignore useful negative feedback and feel threatened by the success of others. Whereas, a Growth Mindset embraces challenges, persists in the face of setbacks, sees effort as the path to mastery, learns from criticism, and finds lessons and inspirations in the success of others" (Dweck, 2006, p. 245). Having a sense of your students' mindset would be important in order to plan class sessions.

MATERIALS AND METHODS

The researchers utilized a quantitative survey design and obtained IRB approval. Informed consent was also acquired

from each participant and all participants were told both of the survey's purpose, which involved answering questions about their classroom experience, and the time required for the survey's completion. Furthermore, all participants were instructed they could withdraw from the research project at any time, since their participation was voluntary.

Data Collection and Analysis

There were 780 student responses generated within an undergraduate institutional setting in a state university system. After the data were cleaned, approximately 720 responses were used in the data analysis. The researchers conducted the data collection from Spring 2021 to Spring 2022 after the pandemic shutdown. The researchers administered the survey in a business school subject pool Principles of Management course, and the research represents an exploratory, single-case study approach. This management course is a requirement for eight different BBA concentrations. Thus, the findings represent a wide-range of academic interests within a business administration curriculum. The researchers believe the variety of students both within a single degree program and outside the degree program creates applicability to other disciplines other than business administration. In fact, there were 20.4% (See Table 1) of the participants who majored outside of business and who utilized this management class to fulfill a degree or major requirement.

Table 1: Business Administration Concentration and Nonbusiness Majors Percentages

BBA Concentration	Percent
Accounting	13.9%
Economics	1.4%
Finance	10.3%
International Business	4.8%
Management	20.5%
Management Information Systems	12.7%
Marketing	14.1%
Supply Chain Management	2.0%
Not a Business Major	20.4%

The researchers utilized Qualtrics software to manage the survey data. The instrument was an online survey which students completed in their own setting, and the questions were structured around the three research questions noted below. Eight questions, each containing multiple subparts, used a five-point Likert scale. Respondents chose from the following options: Very Often, Somewhat Often, Sometimes, Rarely, and Never. The remaining questions were closed multiple choice questions which asked participants their preferences about their study habits and demographics. Statistical testing was run with SPSS Version 29.0.2.0 (20).

Participant Demographics

As highlighted in Table 2, the majority of participants were male at nearly 54%. This is a greater percentage in higher education based on the comparison to the institutional and system percent.

Table 2: Gender Identification

Gender	Research Study Percent	Institutional Percent (FA 2021)	System Percent (FA 2021
Female	43.0%	58.7%	56.9%
Male	53.9%	41.3%	43.1%
Nonbinary	1.3%	Not reported	Not reported
Prefer not to state	1.8%	Not reported	Not reported

The survey respondents were also overwhelming juniors, with 61% stating they were in this class standing as portrayed in Table 3. The prerequisites required for this management course excluded freshmen from enrolling. Furthermore, there is a somewhat balanced percentage of three ethnic/racial groups, African-American, Caucasian, and Latino or

Hispanic, as noted in Table 4. Also, respondents' demographics generally match with either the institution or system percentages for the identified ethnicity or race.

Table 3: Class Standing

Class Standing	Percent
Sophomore	25.3%
Junior	61.1%
Senior	13.6%

Table 4: Respondent Race or Ethnicity

Race or Ethnicity	Research Study Percent	Institutional Percent (FA 2021)	System Percent (FA 2021)
African-American	21.4%	31.8%	25.7%
Asian	14.9%	11.6%	11.7%
Caucasian	26.5%	25.6%	46.1%
Latino or Hispanic	26.1%	26%	10.5%
American Indian or Alaskan Native	0.0%	.2%	.2%
Native Hawaiian or Other Pacific Islander	0.3%	.1%	.1%
Two or More	6.0%	3.9%	3.9%
Other/Unknown	1.6%	.7	1.7%
Prefer not to state	3.2%	Not reported	Not reported

RESULTS

The researchers structured the study's results around topics originating from the main research question, *How are students preparing to learn?* and students were asked to respond to questions from the context of their favorite class.

Student Mindset – Behaviors more conducive to learning

What is the mindset and behaviors students bring to the classroom? Nearly half (46%) of the survey participants stated they came to class very often with a mindset of what they need to learn. When the somewhat often results are added, that percentage jumps to 81% as noted in Table R1. Additionally, 61.5% state they very often or somewhat often came to class having read the material. However, it is important to note that only about 31% responded they come very often having read the material. Approximately, 74% of the respondents stated they come to class (very often, somewhat often, and sometimes) with questions in mind that they want answered.

Table R1: Preparation for Class Session Behavior

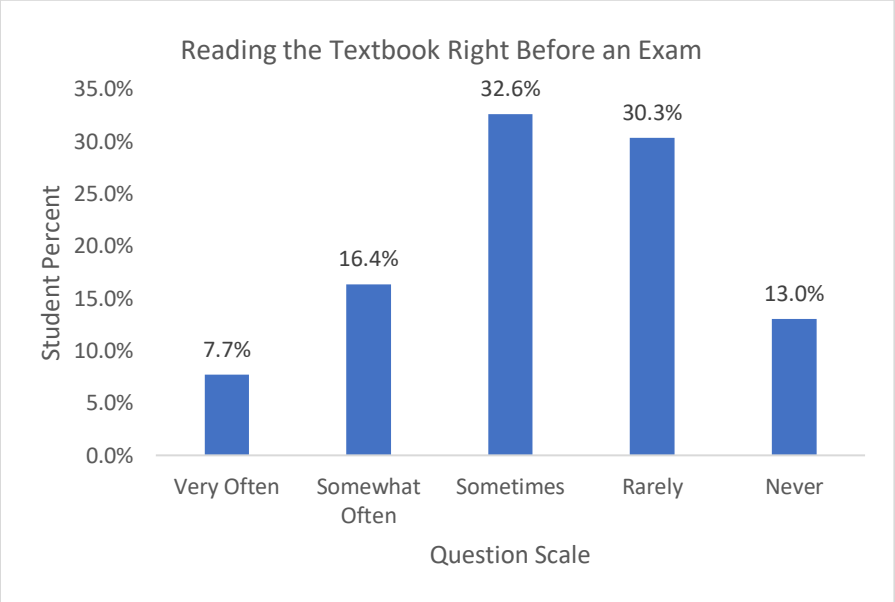
I come to class with a mindset of what I need to learn.		I read the assignment material for the upcoming class session.		I come to classes with questions in mind that I want answered.	
Very Often	45.9%	Very Often	30.6%	Very Often	11.6%
Somewhat Often	35.4%	Somewhat Often	30.9%	Somewhat Often	24.6%
Sometimes	15.0%	Sometimes	24.0%	Sometimes	37.9%
Rarely	2.9%	Rarely	11.4%	Rarely	19.2%
Never	0.8%	Never	3.1%	Never	6.7%

Table R2: Learning Behaviors

I test myself on important topics until I understand them completely.		I find most new topics interesting and often spend extra time trying to obtain more information about them.		I find that I have to do enough work on a topic so that I can form my own conclusion before I am satisfied.	
Very Often	22.5%	Very Often	19.0%	Very Often	22.2%
Somewhat Often	33.0%	Somewhat Often	28.5%	Somewhat Often	35.3%
Sometimes	24.6%	Sometimes	36.0%	Sometimes	31.7%
Rarely	7.3%	Rarely	12.8%	Rarely	8.8%
Never	2.7%	Never	3.8%	Never	2.0%

When it comes to studying behaviors, 55.5% of respondents stated they test themselves on important topics until they completely understand them, either very often or somewhat often, as highlighted in Table R2. When the sometimes category is added, that percentage jumps to 80%. Respondents, either very often or somewhat often, are also putting in time to form their own conclusion as 57.5% spend time working at the topic to form their own conclusion. Similar to the last question, the percentage increases substantially to 89% when the sometimes category is added. Respondents are also putting in extra time with nearly one in five stating very often they spent extra time to obtain more information. Additionally, most students are reading the textbook throughout learning and not just right before an exam with only 24% of respondents claim, very often or somewhat often, they only read the textbook right before an exam as noted in Figure R1.

Figure R1: I only read the textbook right before an exam.



Respondents are generally feeling favorable about studying the course material. They believe that academic subjects can be exciting as a good book or movie as noted in Table R3. Approximately 65% (very often and somewhat often) also believe that any topic can often be high interesting once they get into it, and 54% found studying to give them feelings of deep personal satisfaction.

Table R3: Emotive Learning Behaviors

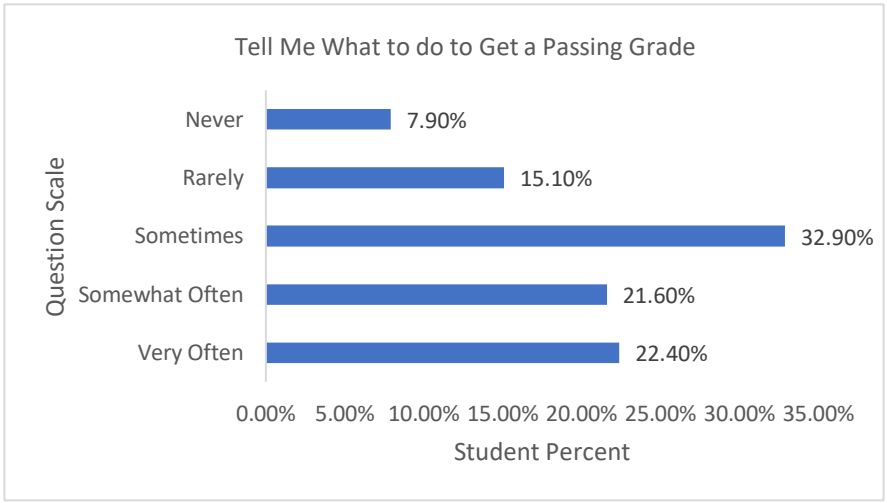
I find that studying academic topics can at time be as exciting as a good novel or movie.		I feel most any topic can be highly interesting once I get into it.		I find that at times studying gives me feelings of deep personal satisfaction.	
Very Often	23.0%	Very Often	29.6%	Very Often	25.1%
Somewhat Often	31.3%	Somewhat Often	35.2%	Somewhat Often	29.0%
Sometimes	26.3%	Sometimes	26.2%	Sometimes	28.1%
Rarely	11.7%	Rarely	6.9%	Rarely	11.0%
Never	7.7%	Never	2.2%	Never	6.8%

Student Mindset – Behaviors not conducive to learning

Expectations of Learning

What impacts students' preparation or mindset? When thinking about their favorite course, results are interesting of the extent to which participants wanted to be told what to do to get a passing grade. Nearly 8% say they never want this to happen as noted in Figure R2. One-third of the participants stated they sometimes want to be told this and 44% reflected they very often or somewhat often want to be told this.

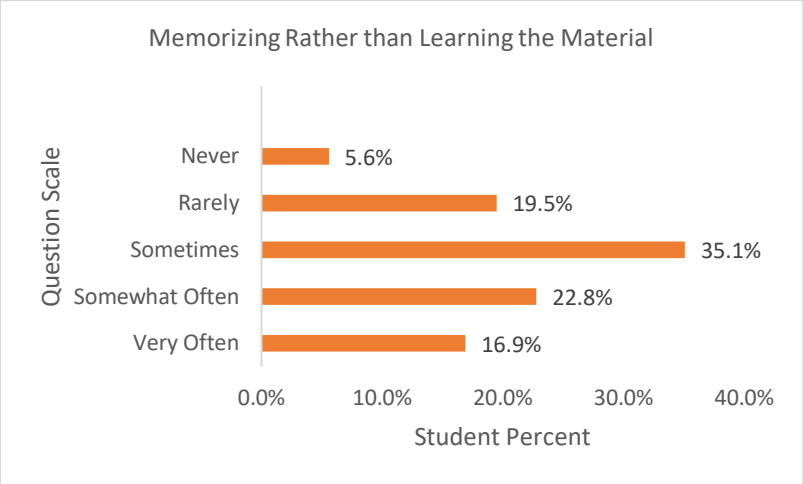
Figure R2: I simply want to be told what to do to get a passing grade.



Learning Course Topics

Results are daunting of the extent to which they want to learn the material. Only 5.6% responded they never will get by just memorizing material for assessments as shown in Figure R3. Slightly over one-third of participants stated they sometimes can and nearly 40% reflect they very often or somewhat often can get by only memorizing and not learning the material.

Figure R3: I find I can get by in most assessments by memorizing key sections rather than trying to learn the material.



Additionally, 29% of the respondents state they very often and somewhat often find no point in learning material if it is not likely to be on the exam as noted on Table R4. When the sometimes category is added, this percent jumps to 62%. When respondents thought of passing the course, the effort they want to expend is low with 57% responding in the very often, somewhat often and sometimes categories. Lastly, 62% will repeat material to "learn" it but not also understanding the material very often, somewhat often, and sometimes.

Table R4: Learning Attitudes and Behaviors

My aim is to pass the course while doing as little work as possible.		I see no point in learning the material if it is not likely to be on the exam.		I learn some things by rote, going over and over them until I know them by heart even if I do not understand them.	
Very Often	12.0%	Very Often	10.7%	Very Often	10.7%
Somewhat Often	16.1%	Somewhat Often	18.4%	Somewhat Often	18.4%
Sometimes	29.2%	Sometimes	33.3%	Sometimes	33.3%
Rarely	30.7%	Rarely	24.5%	Rarely	24.5%
Never	12.0%	Never	13.1%	Never	13.1%

DISCUSSION

The research results indicate that students' perceptions of their learning mindset and their behaviors toward learning have some interesting ramifications for the classroom. These results will be discussed as well as ideas for faculty to drive greater engagement and deeper learning.

Universal Needs

Deci and Ryan (2011) define three universal student needs - competence, relatedness and autonomy (experience of choice). Faculty should embrace these needs as a means to begin classroom design. Faculty need to believe that students want to learn and be competent, at some level, in the topics of their discipline. Likewise, students need to believe that they also can be competent and employ the behaviors/actions to achieve. Competence includes the aspects of support within the learning environment. Thus, the question which needs to be asked is, *What are faculty doing to support the learning within their classroom?* For example, is positive feedback provided within a relatively short timeframe and in the setting/context of some sort of autonomy? For example, students may choose or not to rework aspects of a paper after feedback was given. Also, is there an open and positive atmosphere with the class sessions (Davis, 2001)? Deci and Ryan (2011) found that

when positive feedback was given within an autonomy-supportive ambience it tended to enhance intrinsic motivation, as had been found earlier, but when it was given within a controlling ambience it decreased intrinsic motivation, thus confirming that positive feedback enhances intrinsic motivation only if it is accompanied by some autonomy support. (In short, forced competence development does not enhance intrinsic motivation.). (p. 419)

Next, faculty members need to realize the social context of relatedness is critical. Can students relate both to the faculty member and to other class members either in online or face to face modalities? Is the faculty member relatable to them at some level? Is a faculty member being open to listening to the student experiences which relate to the topic being discussed? For example, in a management classroom, a faculty member could learn what top three characteristics students like in their supervisors.

Lastly if possible, what sort of choices can faculty give students to make them feel like they are somewhat autonomous in learning? There are certain aspects of the higher educational classroom where student never will have choices. For example, the length of a semester since this requirement is dictated by regional accrediting bodies and the program structure which is defined by the discipline faculty and industry. However, students have many choices in the higher educational journey. For example, they usually choose the college or university they attend, they choose their major, they choose the class times, etc. Students need to remember the choices they made to get to the academic program they are in. To meet the learning needs of students, faculty should provide opportunities for choice within their semester graded activities.

Mindset

Approximately 81% of the students say they are coming to class with a mindset of what they need to learn. This statistic appears to be a positive one. However, what do they think they need to learn? Based on the research results many students just want to be told what to do to get a passing grade and only want to memorize for a test rather than learn the material. Thus, how can faculty excite students about the learning process so they see the need in learning as a value to their lives and future careers? Based on the course level and state (required class or not) strategies might be different. For example, if one is teaching an upper division major class, students generally are more internally motivated to study and participate as they see the connections to their future career. If the course is a lower division major course, a faculty member may need to outline how the course topics will be used in future major courses. If the course is a lower division general education course, the faculty member needs to highlight the learning (perhaps the skills, e.g., communication, critical thinking, etc.) which will be obtained in the class for each course topic.

The research indicated that slightly over one-third of students came very often or somewhat often with questions in mind that they wanted answered. This statistics sheds light on the work faculty members need to do for students to come to class prepared. For example, faculty members could ask each student to pose one question on a discussion board prior to the start of class as a graded activity. For face to face classes, the students would need to submit questions (either by paper or electronically) to the professor. The faculty member could use these questions within the daily class session or after the lecture and could review the questions in class to see if all questions were answered. If not, the faculty member could add additional detail to the daily lecture material and could also leave additional time for additional student questions. The research indicated that nearly two-thirds of students will need external motivation to become engaged with the reading.

Learning Strategies to Motivate Learning

Some respondents' answers to learning course topics were alarming. The research indicates that many only want to learn what they need to pass the class while doing as little work as possible. Is this learning? For many participants the learning reflected is memorization, which is the most basic level of Bloom's taxonomy. Most participants only want to get by memorizing topics rather than learning them. Nearly 40% of respondents claimed that they learn by rote until they can say it by memory even if they don't understand the material. In fact, most don't want to engage material unless it is going to be on the exam. It is important to know facts, but it is also important to understand, apply, analyze, and evaluate facts so that one can move to creating ideas or the production of new or novel work with those facts.

How do faculty members excite and interest students about learning with these attitudes? First, a faculty member should know not all students want to learn all material 100% of the time. So, the faculty member needs to decide what percentage will constitute "success" in their eyes, remembering that amotivation exists with some students. Once a goal or percentage is obtained the faculty member can build strategies to achieve that success. For example, it is

important to know how intrinsically motivated students are with the material, so "poll" students about their passion for an upcoming topic. If students are excited or passionate, faculty members can have students come up the ideas for their own learning, can suggest learning topics of special interest to them, etc. If the student is extrinsically motivated, faculty members must give external rewards for the learning. For example, student could present to classmates on topics of noninterest and receiving extra credit. As Davis (2001) notes, faculty members need to assist students with finding personal meaning and value with the ideas under consideration in a class session. For some students, the classic, "It will be on the test next week" will work to motivate them as noted in the research (Marchant, 2002). Marchant (2002) found that a gain of 20 points was obtained when this method was used compared to an assessment not announced.

General Learning Strategies and Learning Emotions

Overall, the student learning behaviors in the research data are positive with only 10% not or rarely testing themselves on important topics until they completely understand them. This statistic suggests that students are working towards learning important topics. Thus, the faculty members have done a good job with highlighting the critical need for these ideas. Additionally, only 16.6% rarely or never find new topics interesting and spend extra time trying to obtain more information about them. Thus, students are liking new topics and are curious at a diversive level to see what additional information and ideas surround them. Again, it appears there is a constructive attitude with new topics. Faculty members need to encourage the students' curiosity and assist them with searching for additional explanations at an epistemic level for these ideas. This encouragement could take the form of presentations or papers on topics the student would like to know if more depth. Lastly, nearly 90% of the respondents found they have to do work on a topic so that they can form their own conclusion before they are satisfied. Thus, their curiosity is carrying them to new levels of learning and forming interpretations and judgements about the topics.

Student emotions while learning are positive with the research results. Respondents indicated that about 19% rarely or never will find study academic topics as exciting as reading a good novel or watching a movie. Further 8.1% rarely or never find most topics highly interesting once they have the time to "get into it." Lastly 17.8% rarely or never find that at times studying give them feeling of deep personal satisfaction. So, what can we conclude from these statistics? The respondents seem ready to engage material and find satisfaction in learning ideas about topics in their favorite class.

Exam Preparation

Additional student behaviors crucial to student preparation and thus success and learning relate to exam topics and whether the students believe those topics will be on an exam. The research indicates that nearly 38% of students rarely or never see no point in learning material if it is not likely to be on the exam. What this statistic is also suggesting is that 62% of students are not learning the material if the connections to the exam are not present. This statistic seems to suggest faculty need to explain connections of topics to not only the exam but also to careers and the wider application of ideas. It can be as simple as describing the connections of ideas to prior course work, skills, and attitudes students need to comprehend. Also, a faculty member needs to review assessments and their structures. Are the exams achieving the course goals and objectives with the questions asked and the exam format?

LIMITATIONS AND FUTURE RESEARCH

As with any research investigation, several limitations exist with the current study. First the data used are from students' perceptions of their own behaviors. Although the researchers assume the data represents the thoughts and actions of the respondents, they understand bias may occur. The management classes used in this study were a course requirement, although respondents did not have to complete the study as there was another option available. Second, the data represents a single case study. It will be important to replicate the ideas in this research with more similar institutions. In addition to replicating this study with other similar institutions, the researchers would like to discover if the same results are found in different types of institutions. There could be similar results or not depending on the type of student at different types of institutions. Thus, the researchers would like to broaden the discipline base, that is survey students who are not in a business program to see if they obtain similar results. Third, juniors made up the largest group of respondents. This reflects the class enrollment during a particular program of study and bias may enter in due to this group. Lastly, respondents had the option to work on the survey outside of class time. This may contribute to additional data error if respondents were distracted during the completion of the survey or the students did not understand the question due to various possible assumptions and interpretations of the survey question.

CONCLUSION AND SUMMARY

The statistics and ideas presented in the Discussion Section are framed from respondents' answers toward their favorite class. If a faculty member is teaching a class that is not falling in this category, there are things one can do. Likely a faculty member may be teaching some classes that are favorites and some that are not. Thus, what overall general conclusions and teaching ideas can one learn from this research? They include:

- Ask students what topics or processes make their classes more interesting and motivating.
- Ask students if they are motivated to discuss a particular topic. Based on the outcome, switch to intrinsic or extrinsic rewards or a combination of both.
- Don't be afraid to only use extrinsic rewards, but also emphasize mastery of topics and ideas. Don't be afraid to only use intrinsic rewards.
- Be supportive in their search for more information and encourage curiosity in learning. Provide additional resources for those students who want to continue learning in an area.
- Provide personal relevance to students about the ideas they are studying.
- Create a supportive classroom environment for learning and set high expectations for students. Allow students choice in the learning and assessment process so that they can learn from those around them.
- Be highly enthusiastic about the material you are presenting and provide interesting and divergent ways to assess learning.
- Encourage students to acknowledge what they do not know and find the gaps in their learning.
- Provide active learning focused lectures which require students to participate in them.
- Have students come to class with questions about the reading or submit questions from their reading before class.
- Don't tell students they are smart, rather compliment them on "the choices they have made, the persistence they display, and so on" (Dweck, 2010, p. 16).

The ideas presented above will support students in their efforts to be more engaged in their learning.

Acknowledgements: The authors would like to thank the Georgia Gwinnett College Provost's Office for the educational leave which supported the creation of this manuscript.

REFERENCES

Bardorfer, A. & Dolenc, P. (2022). Teacher-student rapport as predictor of learning motivation within higher education.*:* The Self-determination Theory Perspective. *Journal of Psychological and Educational Research JPER*, 30 (2), November, 115-133.

Beluce, C., de Oliveira, A., Luciane, K., Carvalho, A. Rua, B., Grosso, M, Beluce, A. C., & de Oliveira, K. L. (2015). Students' Motivation for Learning in Virtual Learning Environments. *Paidéia Vol.* 25, No. 60, 105-113.

Davis, B. G. (2001). *Tools for Teaching.* Jossey Bass, San Francisco, CA.

Deci, E. L. & Ryan, R. M. (1985) Intrinsic Motivation and Self-Determination in Human Behavior. *Springer Science and Business Media*, New York, NY.

Deci, E. L. & Ryan. R. M. (2011). *Self Determination Theory in Handbook of Theories of Social Psychology. Collection: Volumes 1 And 2*, edited by Lange, Paul A. M. Van, et al., SAGE Publications, Limited.

Dewey, J. (1900) *The School and Society*, The University of Chicago Press, Chicago, IL.

Dweck, C. S. (2010). Giving Students Meaningful Work, *Educational Leadership*, Vol. 68, No. 1, 16-20.

Dweck, C. S. (2006). *Mindset: The Psychology of Success*. Ballantine Books, New York., NY.

Elshareif, E. & Mohamed, E. A. (2021). The Effects of E-Learning on Students' Motivation to Learn in Higher Education. *Online Learning*, 25(3), 128-143.

Kim, M., Notts, T. L. & Albers, N. D. (2021). The Role of Motivation in Online Professional Learning Strategies. *Administrative Issues Journal: Connecting Education, Practice, and Research,* Fall 2021, Vol. 11, No. 1, p. 36-53.

LaPiene, K.E., Pettijohn II, T. F., & Palm, L. J. (2022). An investigation of professor and course first impressions as a function of a syllabus. *College Student Journal*, Vol. 56, p. 281-287.

Larson, S. C. (2014). Sustaining engagement and interest in the classroom: Effect of the engage ALL Instructional Model. *National Society for the Study of Education*, Vol. 113 No 1, p 178-198l

Lavine, K. & Blankenship, P. (2022). Exploring the role of work orientation and parental influence on the presence of a calling in college students: Implications for academic motivation and satisfaction. *College Student Journal*. Vol. 58 (4), p. 382.

Leenknecht, M. J., Snijders, I., Wijnia, L., Rikers, R. M. J. P., & Loyens, S. M .M. (2023). Building relationship in higher education so support students' motivation. *Teaching in Higher Education*. Vol. 28, No. 3, 632-653.

Leslie, I. (2014). *Curious: The desire to know and Why your future depends on it*. Basic Books, New York, NY.

Marchant, G. J. (2002). Student reading of assigned articles: Will this be on the test? *Teaching of Psychology,* 29 (1), 49-51.

Rebelo, S., & Isaías, P. (2020). Gamification as an engagement tool in e-learning websites. *Journal of Information Technology Education: Research*, 19, 833-854.

Renninger, K.A. & Hidi, S. E. (2015). *The Power of Interest for Motivation and Engagement*. Routledge Books, Oxfordshire, England.

Ryan. R. M. & Deci, E. L. & (2000). Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. *Contemporary Educational Psychology* (25), p. 54-57.
Ryan. R. M. & Deci, E. L. (2018). *Self-determination Theory, Basic Psychological Needs in Motivation, Development, and Wellness*. Guildford Press.
Satkus, P. & Finney, S. J. (2021). Antecedents of examinee motivation during low-stakes tests: examining the variability in effects across different research designs. *Assessment and Evaluation in Higher Education*, Vol. 46, No. 7, 1065–1079.
Sinek, S. (2009). *Start with Why*. Penguin Group, New York., NY.
Tran, V. D. (2019). Does Cooperative Learning Increase Students' Motivation in Learning? *International Journal of Higher Education*. Vol. 8, No. 5, 12-20.
Yu, F., Zhang, S. & Nunes, L. D. (2023). On students' metamotivational knowledge of self-determination. *Metacognition and Learning*, 18, p. 81–111

Manuscript Guidelines, Submission and Review Process

TOPIC AREAS (BUT NOT LIMITED TO THESE):

- Course design – current courses, new courses, new trends in course topics
- Course management – successful policies for attendance, homework, academic honesty …
- Class material
  - o Description and use of new cases or material
  - o Lecture notes, particularly new and emerging topics not covered effectively in textbooks
  - o Innovative class activities and action-learning – games, active learning, problem based
- Major or emphasis area program design that is new or innovative.
- Assessment – all aspects including AACSB and university level assessment strategies and programs
- Integration of programs or courses with other academic disciplines
- Internship programs
- Business partnerships
- Successful student job placement strategies
- Any topic that relates to higher education business education.

SUBMISSION AND REVIEW PROCESS:

Copyright

- Manuscripts submitted for publication should be original contributions and should not be under consideration with another journal.
- Authors submitting a manuscript for publication warrant that the work is not an infringement of any existing copyright, infringement of proprietary right, invasion of privacy, or libel and will indemnify, defend, and hold Elm Street Press harmless from any damages, expenses, and costs against any breach of such warranty.

Prepare your manuscript

- See the Style Guideline page for specific instructions.
- Articles must make a contribution to business education innovation.
- Manuscripts can be any length. The first 10 pages are charged the current per page rate, and pages over 10 are charged half that rate.
- Articles can be either regular research papers, or shorter notes that succinctly describe innovative classroom teaching methods or activities.
- Manuscripts should be completely finished documents ready for publication if accepted.
- Manuscripts must be in standard acceptable English grammatical construction.
- Manuscripts should be in MS Office Word format. Word 2007 files are acceptable, as are earlier versions of Word. If you are using a new version of Word after Word 2007, save in Word 2007 format.

Submit your manuscript

- Manuscripts may not have been published previously or be under review with another journal.
- Submit the manuscript attached to an email to **submit@beijournal.com**
- We will respond that we have received the manuscript.
- Article submissions can be made at any time.
- Submission deadlines: September 15 for December issue, March 15 for June issue.

Manuscript review

- The editor and reviewers will review your submission to determine if 1) the content makes a contribution to innovative business education, 2) is of the proper page length, 3) is written in proper grammatical English, and 4) is formatted ready for publication.
- Submissions not meeting any of these standards will be returned. You are invited to make revisions and resubmit.
- If the submission meets the standards, the manuscript will be sent to two reviewers who will read, evaluate and comment on your submission.
- The editor will evaluate the reviews and make the final decision. There are 3 possible outcomes:
    - Accept as is.
    - Accept with minor revisions.
    - Not accepted.
- Reviews will be returned promptly. Our commitment is to have a decision to you in less than two months.
- If your paper is not accepted, the evaluation may contain comments from reviewers. You are invited to rewrite and submit again.

If your paper is accepted

- Minor revision suggestions will be transmitted back to you.
- Revise and send back as quickly as possible to meet printer deadlines.
- Upon final acceptance, we will bill you publication fees. See www.beijournal.com for latest per page fees. Sole author fees are discounted.
- The fees include all costs of mailing a copy of the issue to each author via standard postal ground.
- Delivery to locations outside the continental US will cost an additional $10 per author for 5 day delivery.
- Faster delivery methods are available for US and international delivery. Contact the editor for a specific pricing.
- All publication fees should be remitted within 10 business days of acceptance, if possible.
- If you decide not to publish your paper with BEI Journal after submitting payment, we will refund publication fees less $200 to cover costs of review and processing.
- Cancellation cannot occur after the paper has been formatted into the final printer's file.

Manuscript Style Guide and Example

An example is provided following these instructions.
This style guide represents style guidelines in effect for future issues, but always check for updates online.
Authors are responsible for checking for correct grammar, construction and spelling. Authors are also responsible for formatting pictures, tables, and figures such that a pdf black and white file sent to the publisher will reproduce in a readable manner.

General Setup:

- All fonts other than exceptions noted below: Times New Roman. 10 point for text. Other sizes as noted below
- Margins: 1 inch on all sides of 8½x11 inch paper size.
- No headers or footers,m other than page numbers centered lower.
- Absolutely no footnotes or endnotes via footnote or endnote formatting. For footnotes or endnotes, place a number of the footnote in the proper location as a superscript. Then at the end of the paper or bottom of the page, add the footnote as text with a superscript number to correspond to that footnote.
- Page numbering bottom centered.
- No section breaks in the paper.
- No color, including url's. Format to black. No color in tables or figures. Use shading if necessary.
- All pages must be portrait orientation. Tables and figures in landscape orientations should be reformatted into portrait orientation.
- All paragraphs should be justified left and right, single spaced, in 10 point Times font, no indent on first line, l line between each heading and paragraph.
- One line between each paragraph.

Titles, Authors, and Headings:

- **Title centered 14 point bold**. One line between title and author's name.
- Authors: centered, 12 point. Name, affiliation, state, country.
- One line space to **ABSTRACT** (title 10 point, bold, all capitalized, aligned left; text of abstract 10 point, no bold)
- After **ABSTRACT**, one line space, then **Keywords**. Followed by one line space to first major heading.
- **HEADINGS, MAJOR**, 10 point, bold, all capitalized, aligned left.
  The specific headlines will be based on the content of the paper, but major sections should at a minimum include an abstract, keywords, introduction, conclusion, and references.
- **Sub-headings**: 10 point, bold, first letter capitalized, no line to following paragraph. Align left.
- *Third level headings: Italic*, 10 point, first letter capitalized, no line to following paragraph. Align left.
- **Keywords:** heading: 10 point, bold, first letter capitalized, no line to following paragraph. Align left. Your list of keywords in 10 point, no bold.

Tables, Figures and Graphs:

- All fonts 10 point.
- Numbered consecutively within each category. Table 1, Figure 1 etc.
- Title: 10 point, bold, left justify title, one space, then the table, figure, etc.
- Example: **Table 1: Statistical Analysis**

References:

- APA format when citing in the text. For example (Smith, 2009).
- References section: 8 point font, first line left margin, continuation lines 0.25 inch indent. Justify left and right. No line spacing between references. List alphabetically by first author.
- Specific references: Last name, First initial, middle initial (and additional authors same style) (year of publication in parentheses). Title of article. *Journal or source in italics.* Volume and issue, page number range.
- Example: Clon, E. and Johanson, E. (2006). Sloppy Writing and Performance in Principles of Economics. *Educational Economics.* V. 14, No. 2, pp 211-233.
- For books: last name, first initial, middle initial (and additional authors same style) (year of publication in parentheses). *Title of book in italics.* Publisher information.
- Example: Houghton, P.M, and Houghton, T.J. (2009). *APA: The Easy Way!* Flint, MI: Baker College.

Example (note that this example represents a change from previous style guides)

Evidence to Support Sloppy Writing Leads to Sloppy Thinking (14 pt bold)

Peter J. Billington, Colorado State University - Pueblo, Colorado, USA (12 point)
Terri Dactil, High Plains University, Alberta, Canada

ABSTRACT (10 point, bold, all capitalized, left justified)

(text: 10 point Times font, no indent, justified, single space, 150 words maximum for the abstract)
The classic phrase "sloppy writing leads to sloppy thinking" has been used by many to make writers develop structured and clear writing. However, although many people do believe this phrase, no one has yet been able to prove that, in fact, sloppy writing leads to sloppy thinking. In this paper, we study the causal relationship between sloppy writing and sloppy thinking.

Keywords: sloppy writing**,** sloppy thinking **(10 point, bold title, first letter capitalized, left justified).**

INTRODUCTION (10 point, bold, all capitalized, left justified).

The classic phrase "sloppy writing leads to sloppy thinking" has been used by many to make writers develop structured and clear writing. However, since many people do believe this phrase, no one has yet been able to prove that in fact, sloppy writing leads to sloppy thinking. Is it possible that sloppy writing is done, even with good thinking. Or perhaps excellent writing is developed, even with sloppy thinking.

In this paper, we study the writing of 200 students that attempts to test the theory that sloppy writing leads to sloppy thinking.

PREVIOUS RESEARCH

The original phrase came into wide use around 2005 (Clon, 2006), who observed sloppy writing in economics classes. Sloppy writing was observed in other economics classes (Druden and Ellias, 2003).

RESEARCH DESIGN

Two hundred students in two business statistics sections during one semester were given assignments to write reports on statistical sampling results. The papers were graded on a "sloppiness" factor using…

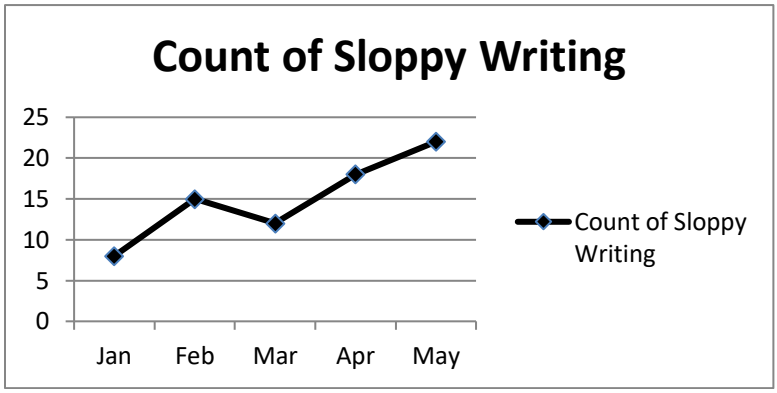
Data Collection (Sub-heading, bold but not all caps, 10 point, aligned left, bold, no line after to paragraph)
The two hundred students were asked to write 2 short papers during the semester…

Data Analysis(Sub-heading, bold but not all caps, 10 point, aligned left, bold, no line after to paragraph)
The two hundred students were asked to write 2 short papers during the semester…

DISCUSSION

The resulting statistical analysis shows a significant correlation between sloppy writing and sloppy thinking. As noted below in Figure 1, the amount of sloppy writing increases over the course of the spring semester.

Figure 1: Sloppy Writing During the Semester (10 pt bold, 1 line after to table, left justify)



The count results were compiled and shown in Table 1 below.

Table 1: Counts of Good and Sloppy Writing and Thinking (bold, 1 line after to table, left justify)

	Good Thinking	Sloppy Thinking
Good Writing	5	22
Sloppy Writing	21	36

*-Indicates significance at the 5% level)

As Table 1 shows conclusively, there is not much good writing nor good thinking going on.

CONCLUSIONS

The statistical analysis shows that there is a strong relation between sloppy writing and sloppy thinking, however, it is not clear which causes the other…

Future research will try to determine causality.

REFERENCES (title10 point, all caps, bold, align left, one line to first reference)
(1line spacing) (All references 8 point, indent second line 0.25 inch)

Clon, E. (2006). Sloppy Writing and Performance in Principles of Economics. *Educational Economics*. V. 14, No. 2, pp 211-233.

Devad, S. and Flotz, J. Evaluation of Factors Influencing Student Class Writing and Performance. *American Journal of Farming Economics*. V. 78, Issue 3, pp 499-502.

Druden, G. and Ellias, L. (1995). *Principles of Economics*. New York: Irwin.

(short bio section optional, can run longer than these examples; removed before sent to reviewers)

Peter J. Billington, Ph.D., is a professor of operations management at Colorado State University – Pueblo. His research interests include lean six sigma and innovative education.

Terri Dactil, Ph.D., is a professor of business communication in the College of Business at High Plains University, Alberta, Canada. His research interests include instructional methods to improve student communication skills.

Endnote: (do not use word footnote or endnote formatting to accomplish this; see comments above)

Build 2 on 8-29-2025

