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Transforming Online Learning: Integrating Arts and Leadership to Foster Engagement and Connectedness

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Abstract

This study explores how integrating the arts in humanities courses with transformational administrative leadership promotes meaningful student engagement, critical thinking, and appreciation of differing viewpoints in online learning. By analyzing student engagement data and high-performance team leadership research, it presents a framework that empowers educators and administrators to create more dynamic and connected virtual classrooms. The findings offer actionable strategies to strengthen student-faculty interactions, foster mindfulness and collaboration, and align online education with institutional goals for academic excellence and student success.

The Need

Online learning primarily serves students who are often motivated and seek flexible educational opportunities that align with their personal and professional responsibilities (Ross-Gordon, 2011; Muljana & Luo, 2019). While these students demonstrate strong self-direction and persistence, online education presents unique challenges, including feelings of isolation, limited engagement with course material, and a lack of deep, interactive discussions that support critical thinking (Kahu et al., 2017; Hart, 2012; Mullinix, Binger, & Lees, 2021). Additionally, the absence of in-person cues can make it more difficult to navigate sensitive or complex topics, requiring intentional strategies to foster inclusive, thoughtful dialogue. These challenges are further compounded by the lack of structured faculty support, particularly for online adjunct instructors, who often receive minimal training in student engagement strategies and may struggle with limited institutional resources and professional development opportunities (Kezar & Sam, 2013; Tipple, 2010). Without adequate leadership support, faculty can become disengaged, leading to passive instruction that further disconnects students from meaningful learning experiences. Addressing these challenges necessitates a structured approach that enhances both student engagement and faculty leadership development, ensuring that online education fosters a dynamic, connected learning environment where students and instructors thrive.

Introduction

This paper explores how integrating the arts in humanities courses with transformational administrative leadership strategies enhances student engagement, fosters empathy, and strengthens faculty effectiveness in online learning environments. The first section examines how arts-based learning deepens student connections to course material, encourages perspective-taking, and creates a non-threatening space for discussing complex issues. The second section focuses on faculty leadership development, using the Balanced Duality Model (B-D Model) and Level 1 & 2 High-Performance Team (HPaT) training to structure faculty training that balances adaptability, resilience, and student-centered teaching. By synthesizing these two areas, the final section presents a comprehensive framework that equips university administrators with actionable strategies for cultivating meaningful engagement, promoting inclusivity, and enhancing online education quality.

Section One: The Arts

Arts Infusion Assists in Student Empathy

Arts-based learning serves as a powerful catalyst for student engagement and empathy, fostering deep connections with diverse perspectives that extend beyond traditional text-based instruction. This section examines student reflections from a humanities course that integrated the arts to explore identity, societal structures, and historical narratives, emphasizing critical analysis, self-reflection, and cultural awareness. Through discussions, written reflections, and project-based learning, students engaged with creative works—including visual art, literature, and performance pieces—as tools for challenging assumptions, expanding viewpoints, and refining critical thinking skills. Analysis of student reflections revealed two key themes: *Engagement* and *Broadening Perspectives*. Engagement highlights how students shifted from passive observation to active interpretation and self-reflection, forming deeper intellectual and personal connections with course material. Broadening Perspectives demonstrates how students developed a more comprehensive understanding of historical, cultural, and social influences in artistic expression. These findings underscore the transformative potential of arts-based learning in online education, illustrating how creative engagement fosters empathy, critical inquiry, and meaningful academic growth.

Table 1

Humanities Student Reflections (HUM 102 Self, Society, and Humanities)

	Student	Engagement	Broadening Perspective
1	Participant 1	Enjoyed different perspectives and creative works – "I truly enjoyed this course and hearing different perspectives and creative works!"	Considers historical, social, and political influences in art – "Now, when I view art, I want to research the time it was created and its social, cultural, and political influences on its creator."
2	Participant 2	Developed an open mind through humanities – "The humanities have given me more of an open mind when it comes to critical thinking."	Understands how experiences shape behavior and actions – "Now, I consider all factors of a person's history and culture when viewing and experiencing a creative work."
3	Participant 3	Learned to connect art to real-world issues – "Exploring how creative works reflect cultural, historical, and personal contexts gave me a new appreciation for art, literature, and other forms…"	Now approaches art with an open mind, considering multiple viewpoints – "Now, I approach creative works with an open mind, considering the artist's purpose, the audience's interpretation…"
4	Participant 4	Gained empathy towards others – "During this course I have learned to be more open-minded and have empathy towards others."	Thinks about others' backgrounds before making assumptions – "I feel like the humanities help me to see a more diverse perspective and understand more about the world and people around me."
5	Participant 5	Appreciated the role of humanities in understanding diverse experiences – "I have enjoyed this course and the way it has made me think harder and put more effort into my statements before writing them down."	Recognizes how different generations perceive change differently – "Having the skill to be more open-minded and try to understand one's background and heritage before making assumptions is something I think everyone should understand."
6	Participant 6	Found critical thinking and empathy essential skills – "Critical thinking helped me to analyze complex issues like racism from multiple perspectives."	Recognized the importance of analyzing multiple viewpoints – "I also found critical thinking and empathy to be essential skills practiced throughout the course."
7	Participant 7	Realized humanities impact mindset and outlook – "One of the most important concepts I have learned from this course	Views mental health as a shared human experience rather than a negative aspect – "We all struggle with things within our day-to-day lives and knowing there are so

		would be all the ways the humanities and their expressions can have an impact on your outlook and mindset."	many others in the world that have the same challenges makes it less scary to work through when it happens to you."
8	Participant 8	Learned to connect creative works to personal and global issues – "At first, I wasn't sure how I would connect a piece of art to any topic, but this course showed me how the humanities help us understand the world by encouraging critical thinking."	Expanded understanding of how art conveys meaning across different perspectives – "Reading our peers' insights on their creative works and connecting them to cultural appropriation was eye-opening."
9	Participant 9	Became more open-minded and empathetic – "Since humanities, I have started thinking about what the other person may be going through before I assume it is me they have the problem with."	Considers others' lived experiences before forming opinions – "I think that I can also use these practices in my personal life with my teenage son and fiancé."
10	Participant 10	Discovered humanities allow for self-expression and appreciation of others – "Empathy is a great topic to choose from this course as it allows us to take a deeper dive into where people come from."	Acknowledged influences in creative works and perspectives – "I agree that the humanities allow you to express yourself and view the expression of others without words."
11	Participant 11	Gained deeper appreciation for humanities in daily life – "Movies, songs, plays, etc., that we see/hear every day show us an insight into humanities."	Recognized importance of different generational perspectives on social change – "Being able to take what I have learned in this course from different people's opinions to how to create meaning behind something to being able to think critically will benefit me not only in future courses but in my life outside of school."

Analyzing Student Engagement Through the Arts

The student reflections reveal that engagement in the humanities class was profoundly enriched through the integration of the arts, fostering a deeply immersive and transformative learning experience. Students moved beyond passive observation to active interpretation, self-reflection, and critical analysis, using creative works as a mirror for their own experiences while broadening their understanding of others. The arts provided a non-threatening entry point for discussing sensitive topics like racism, mental health, and cultural representation, allowing students to navigate complex issues with openness rather than defensiveness. Unlike direct debates, which can feel confrontational, creative works encouraged thoughtful, reflective engagement, making difficult conversations more accessible. Peer discussions further deepened student interaction with the material, challenging initial interpretations, expanding perspectives, and reinforcing the idea that no single "correct" interpretation exists. This collaborative approach strengthened empathy, intellectual curiosity, and cultural awareness, demonstrating the power of the arts in fostering meaningful academic and personal growth. Ultimately, students did not just consume knowledge—they actively participated in the learning process, making their engagement with the humanities class both impactful and enduring.

Analyzing How Perspectives Expanded Through the Arts

Student reflections demonstrate a significant evolution in perspective as they engaged with creative works, shifting from personal or aesthetic interpretations to a broader contextual understanding. Many students began analyzing art with an awareness of historical and social influences, recognizing how movements, cultural shifts, and political contexts shape creative expression. This deeper engagement allowed them to see art as a reflection of human experience, where identity, societal struggles, and personal narratives are embedded within creative works. By understanding that artistic interpretation is shaped by time, place, and lived experience, students developed a more

informed and analytical approach to the humanities, embracing the idea that multiple viewpoints—including those of the artist, audience, and various social groups—contribute to meaning. Their evolving perspectives were further strengthened through empathy and a willingness to challenge personal biases, particularly regarding social issues such as mental health and cultural representation. Many realized that their initial assumptions about creative works and historical narratives were shaped by their own experiences, and exposure to diverse perspectives encouraged them to reconsider and refine their viewpoints. Art became a powerful tool for perspective-taking, fostering thoughtful reflection and deeper intellectual curiosity. Ultimately, integrating the arts into the humanities led students to approach creative works—and the world itself—with greater open-mindedness, critical awareness, and a deeper appreciation for diverse perspectives.

Art as a Catalyst for Intercultural Sensitivity

The students' transformative interactions and evolving interpretations align closely with Milton Bennett's Intercultural Sensitivity Model (2017), which describes the stages individuals go through as they develop the ability to recognize, understand, and adapt to cultural differences. Initially, many students engaged with art from a monocultural perspective, viewing creative works through a personal or surface-level lens. However, through critical analysis, peer discussions, and exposure to diverse artistic expressions, they progressed through the acceptance and adaptation stages, where they recognized that meaning is shaped by historical, social, and cultural contexts. The inclusion of arts in the humanities class facilitated this shift by providing a neutral and accessible medium for exploring multiple viewpoints, allowing students to develop empathy and open-mindedness without defensiveness or resistance. As students analyzed artistic intent, questioned assumptions, and engaged in perspective-taking, they moved toward the integration stage, where they could fluidly navigate and appreciate different perspectives while critically examining their own biases. Ultimately, the course created an environment that fostered cognitive and emotional flexibility, mirroring the developmental process of intercultural sensitivity and reinforcing the power of arts in shaping deeper human connections across differences.

Section Two: High Performance Team Leadership

Administrative Leadership Developing Faculty

This section explores the role of faculty development in fostering engagement and connectedness in online education, complementing the previous section on how the arts cultivate empathy and critical thinking. For university administrators, enhancing student engagement requires more than implementing new teaching strategies—faculty must be trained in leadership approaches that promote interaction, adaptability, and sustained learning. Drawing from Level 1 & 2 High-Performance Team (HPaT) training, this section outlines how structured faculty development equips instructors with the skills to mentor students, facilitate discussions, and create dynamic learning environments that align with institutional goals. The Woody Continuum of High-Performance Teams provides a framework for faculty leadership progression, aligning online faculty development with Level 1 (Foundational Training) for standardized instructional practices and Level 2 (Advanced Training) for refining engagement strategies, guiding reflective discussions, and adapting to diverse student needs. These levels emphasize structured onboarding, instructional consistency, and mentorship, ensuring that faculty balance content delivery with meaningful student interaction. By applying this structured leadership model, administrators can create a scalable and sustainable approach that enhances faculty training, strengthens course design, and deepens student engagement in online education.

The Need for High-Performance Leadership Development in Online Education

In online education, faculty plays a critical role in fostering engagement and building student connectedness. However, many universities lack structured leadership development programs that prepare faculty to effectively manage student interactions in a virtual setting. Level 1 & 2 HPaT training offers a framework for developing, managing, and sustaining high-performing faculty who can lead engaging, discussion-driven courses. Unlike traditional faculty training, which often focuses solely on pedagogy and technology, this approach ensures that faculty develop essential leadership skills, including adaptability, resilience, and mentorship capabilities.

Rather than viewing faculty training as a one-size-fits-all process, the Woody Continuum categorizes faculty development according to performance levels rather than years of experience. This allows university administrators to design targeted training programs that enhance teaching effectiveness, student engagement, and institutional outcomes. Just as elite teams in high-stakes industries require structured progression models, faculty leadership training should follow a similar trajectory, ensuring that instructors develop both technical competencies and the ability to create dynamic, student-centered learning environments.

Aligning Faculty Training with High-Performance Team Levels

Faculty training should align with the operational complexity of online education, ensuring that instructors receive the appropriate level of development without unnecessary stress or training intensity. The Woody Continuum of High-Performance Teams maps training intensity according to performance stakes, with Level 1 & 2 aligning with faculty development in online learning. Misalignment between training rigor and institutional needs can result in burnout, disengagement, and ineffective instructional strategies, making it important for university administrators to structure faculty training according to the appropriate HPaT levels.

The Woody Continuum HPaT chart provides a visual representation of how training intensity aligns with faculty development needs. Since online education falls within Level 1 & 2, faculty training should emphasize:

- Level 1: Foundational Faculty Training – Standardized Instruction & Course Facilitation

  Focus: Establishing structured, consistent online course delivery through faculty onboarding, procedural adherence, and mentorship.

  Training Emphasis: Faculty receive training in standardized course facilitation, ensuring instructors understand institutional expectations for online teaching, student interaction, and academic integrity.

  Example: New online faculty participate in structured onboarding programs, including training on discussion board engagement, grading consistency, and student communication best practices.

- Level 2: Advanced Faculty Training – Enhancing Engagement & Connectedness

  Focus: Developing faculty leadership skills to foster student engagement, guide reflective discussions, and adapt to diverse learner needs.

  Training Emphasis: Faculty move beyond procedural adherence, learning how to create dynamic, discussion-driven learning environments that balance academic rigor with student-centered teaching approaches.

  Example: Faculty participate in scenario-based training, practicing how to respond to disengaged students, restructure discussions for deeper engagement, and integrate interdisciplinary perspectives in course content.

Beyond Level 2: Distinctions from Higher HPaT Levels

While Level 3-5 training applies to high-pressure industries requiring precision under extreme conditions (e.g., emergency response, military operations, and elite medical training), online faculty development does not require this level of stress endurance or tactical readiness. Instead, online university faculty thrive in structured, engagement-driven learning environments that prioritize adaptability, mentorship, and continuous professional growth—all of which align with Level 1 & 2 HPaT training principles. By structuring faculty training according to Level 1 & 2 HPaT strategies, university administrators can ensure that instructors are well-prepared to foster student engagement, support institutional goals, and enhance online education quality. For a visual representation of how faculty training aligns with HPaT development, administrators can refer to the Woody Continuum HPaT chart below.

Strengthening Faculty Leadership with the Woody Continuum Model

University administrators can enhance faculty development by integrating Level 1 & 2 High-Performance Team (HPaT) training principles, ensuring that instructors cultivate adaptability, resilience, and leadership skills necessary for sustained engagement in online education. The Woody Continuum Model aligns faculty training with structured development levels, ensuring that instructors progressively enhance their leadership capabilities while maintaining an engagement-driven teaching approach. By implementing structured mentorship programs, scenario-based faculty engagement training, and targeted leadership development, administrators can transition faculty from content deliverers to transformational educators who create interactive, student-centered online learning environments. Misalignment between faculty training intensity and online education's operational complexity can contribute to burnout, disengagement, and ineffective instructional strategies. Structuring faculty leadership development according to the Woody Continuum (2024) ensures a scalable and strategic approach to faculty training that enhances student engagement and supports institutional success.

Table 2

Woody Continuum

Level	Team Type	Characteristics of the Team	Pressure & Stressor	Work Environment	Example Teams	Traits	Challenges
Level 1	**Standard High-Performing Teams (HPiTs)**	Goal-driven, task-oriented-Structured processes, Focus on consistent results through collaboration	Routine task demands, Predictable outcomes, Low variability	Stable, routine environments, Low risk, Minimal external disruptions	Corporate offices, administrative departments	Optimized performance within clear boundaries	Risk of complacency, lower morale if peformance is stifled, various abilities of management, often reaches temporary high-performance
Level 2	**Adaptive High-Performing Teams (HPiTs)**	Increasing emphasis on adaptability and innovation, Unity and shared values, Handles moderate external pressures	Moderate task complexity-Introduction of innovation-Some external variability	Dynamic environments, Moderate risk, Increasing complexity and some external changes	R&D departments, strategic planning units	Balancing stability with innovation, increased collaboration	Higher risk of errors as flexibility increases, potential stress from moderate external pressures
Level 3	**Baseline High-Performance Teams (HPaTs)**	Specially selected experts, Operate under high-pressure, time-sensitive conditions, Highly adaptable and innovative	High stakes with tight deadlines, High variability-Complex, dynamic conditions	High-pressure environments, Fast-paced, High variability and frequent external changes	Professional sports teams, high-stakes corporate teams	High adaptability, quick decision-making, focus on innovation, and continued success	Increased risk of burnout, psychological stress due to high stakes and continuous pressure
Level 4	**Moderate High-Performance Teams (Moderate HPaTs)**	Primarily passive operations-Must be ready to react swiftly-High preparedness for sudden high-pressure situations	Generally low-stress but with potential for rapid escalation, Must prevent or respond to potential catastrophic events	Mixed environments: routine with sudden high-risk scenarios- Must transition quickly from low to high pressure, positioned to return stability to environment	Security guards, police patrol officers, quick medical response teams	High readiness, strong situational awareness, ability to switch rapidly from passive to active roles	Maintaining vigilance during passive periods, risk of high stress during sudden escalations, must avoid complacency, risk of catastrophic failure, often ignored or undervalued
Level 5	**Elite High-Performance Teams (HPaTs)**	Operate under extreme pressure, Zero margin for error, Intense psychological resilience, Flawless execution required	Life-or-death decisions, Severe consequences for failure, Intense public/media scrutiny	Extreme high-pressure environments, High-risk, Constant external pressures	Military operations, space missions, disaster response units	Peak performance, strong psychological resilience, continuous excellence, specially selected members and leadership	High risk of burnout, psychological breaks, extreme stress, potential for catastrophic failure if errors occur, proper recruitment

Section Three: Analysis of Dual Approach

Framework for Administrators: Integrating Arts and Leadership in Online Learning

This section presents a framework that integrates arts-based student engagement with structured faculty leadership development, providing university administrators with actionable strategies to enhance online learning. Empathy and engagement are critical for student success, yet traditional virtual classrooms often lack the depth of connection necessary to foster critical thinking, cultural awareness, and meaningful interaction. This model addresses these challenges through a *dual approach:* (1) using arts integration to deepen student engagement and (2) applying structured leadership training based on Level 1 & 2 High-Performance Team (HPaT) strategies to enhance faculty effectiveness. By combining creative exploration with structured instructional leadership, this framework ensures that students connect with course material on both an analytical and emotional level while faculty are equipped with strategies to create dynamic, student-centered learning environments. This *holistic strategy* ensures that online education is not merely transactional but deeply transformative, encouraging students and faculty to explore, reflect, and engage with diverse perspectives in ways that extend beyond traditional content delivery.

How This Research is Novel to Online Learning

This study offers a distinct contribution to online learning research in several keyways:

1. Arts as a Tool for Deepening Student Engagement – Unlike traditional content-driven models, this framework prioritizes arts-based exploration to help students engage with diverse perspectives, fostering empathy and critical reflection.
2. HPaT-Informed Faculty Leadership Training – By applying Level 1 & 2 High-Performance Leadership Training (HPaTs), this framework introduces structured faculty engagement strategies that promote student-centered mentorship, adaptability, and resilience.
3. Bridging Emotional and Intellectual Learning – This approach integrates creative expression with structured leadership training, ensuring students develop both analytical and emotional intelligence.
4. A Scalable Model for Institutional Growth – This framework provides administrators with an adaptable roadmap for improving online education without requiring a complete system overhaul, making it easy to integrate within existing academic structures.

By combining arts-based engagement with structured faculty leadership development, this research introduces a novel approach to online learning that goes beyond traditional content delivery. This model uniquely integrates creative exploration with high-performance instructional leadership, fostering deeper student connections, critical thinking, and adaptability in virtual classrooms. As a result, online learning environments become more dynamic, reflective, and conducive to meaningful academic and personal growth.

Practical Strategies for Online University Administrators

Practical Actionable Strategies for Online University Administrators

This framework offers two core strategies: (1) arts integration to enhance student engagement and (2) faculty leadership development using HPaT Level 1 & 2 strategies to optimize virtual instruction. These approaches equip faculty with the tools necessary to foster student connectedness, critical thinking, and active participation in online courses.

1. Arts Integration for Student Engagement & Empathy Development

The arts help students engage with diverse cultural expressions, reflect on human experiences, and explore alternative perspectives. Administrators can implement arts-based learning as a foundational strategy for fostering deep engagement in virtual classrooms.

- Use Creative Works to Foster Perspective-Taking

  Assign students visual art, literature, music, or film that depict diverse human experiences, encouraging critical analysis and reflection.

  Example: A humanities course could feature photographic series on migration, helping students interpret the historical, emotional, and social implications of displacement.

- Encourage Self-Expression Through Creative Assignments

  Offer opportunities for students to respond to course material through digital storytelling, visual art, or poetry to deepen personal and analytical engagement.

  Example: Instead of a traditional essay, students could create a multimedia project exploring how different cultures depict resilience and leadership through artistic expression.

- Implement Digital Storytelling & Cross-Cultural Exploration

Require students to engage with artistic works from different cultures and respond through comparative analysis and reflective discussions.

Example: A course on social movements could analyze protest art across cultures, examining how artistic activism shapes public perception and societal change.

- Facilitate Empathy-Driven Discussions Using the Arts

  Create discussion-based learning experiences that encourage students to step into the perspectives of historical figures, artists, or fictional characters to explore complex themes.

  Example: A literature class could have students rewrite a scene from multiple perspectives, helping them analyze social and cultural influences on different narratives.

By integrating arts-based approaches, universities cultivate online learning experiences that are not only immersive but also emotionally and intellectually stimulating. These creative methods encourage students to form personal connections with course materials, fostering deeper engagement and critical reflection. As a result, students develop a greater appreciation for diverse perspectives while enhancing their ability to think analytically and empathetically.

2. Faculty Leadership Development for Structured Engagement (HPaTs Level 1 & 2)

While arts integration fosters student engagement, faculty leadership training ensures that virtual classrooms remain structured, adaptable, and student-centered. Using Level 1 & 2 High-Performance Team (HPaT) training strategies, university administrators can structure faculty development to enhance teaching effectiveness and engagement in online learning.

HPaT Faculty Development Model:

- Level 1: Foundational Faculty Training – Standardized Instruction & Course Facilitation

  Focus: Establishing consistent online course delivery through structured onboarding, procedural adherence, and mentorship.

  Training Emphasis: Faculty at this level receive training in standardized course facilitation, grading consistency, and student communication best practices.

  Example: New faculty participate in structured onboarding programs, learning effective discussion board engagement and instructional consistency.

- Level 2: Advanced Faculty Training – Enhancing Engagement & Connectedness

  Focus: Developing faculty leadership skills for fostering student engagement, guiding reflective discussions, and adapting to diverse learner needs.

  Training Emphasis: Faculty at this level refine their ability to create dynamic, discussion-driven learning environments that balance academic rigor with student-centered teaching approaches.

  Example: Faculty participate in scenario-based training, practicing strategies to restructure discussions, engage disengaged students, and integrate interdisciplinary perspectives.

By aligning faculty training with HPaTs Level 1 & 2, administrators create a structured pathway that equips instructors with the skills needed to foster deep student engagement in online learning environments. This targeted approach ensures faculty can effectively balance instructional consistency with adaptability, allowing them to support institutional goals while responding to diverse student needs. As a result, online education quality is enhanced through faculty leadership that promotes meaningful interactions, student-centered learning, and sustained academic engagement.

Conclusion: A Transformative Model for Online Education

This dual framework—where arts-based student engagement meets leadership-driven faculty instruction—redefines online learning as a dynamic and human-centered experience. By integrating the arts, students engage with diverse perspectives, fostering empathy, self-reflection, and critical analysis that deepen their academic and personal growth. Simultaneously, faculty trained in structured leadership strategies cultivate a supportive and intellectually stimulating environment, ensuring students feel challenged, valued, and connected. The Woody Continuum of High-Performance Team Levels provides a structured model for faculty leadership progression, equipping instructors with adaptable strategies to sustain engagement and facilitate transformative learning. Unlike traditional online learning models, this framework encourages emotional connection and intellectual engagement, making learning both meaningful and immersive. Arts-based assignments ignite curiosity, while structured faculty mentorship ensures students feel valued and engaged. This model is both scalable and sustainable, offering universities a strategic approach to enhancing student retention, fostering deeper academic engagement, and elevating the overall quality of online education. Ultimately, by integrating arts-based learning with high-performance faculty leadership, institutions ensure online learning remains engaging, interactive and deeply connected to student success.

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Post-Pandemic Online Improvement: Using UX and LDX to Enhance Online Student Enrollment and Success

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Abstract

At the heart of distance learning administration is the drive to enroll students and enable their success. Online learning has evolved and matured into a mainstream form of education, resulting in a highly competitive environment among institutions of higher education. According to IPEDS data (2024), more than 54 percent of students enrolled in public colleges and universities were taking at least one online class in Fall 2023. States with the highest percentages (60 - 71 percent) were Alaska, Arizona, Florida, Hawaii, Mississippi, New Mexico, North Carolina, and North Dakota. Only two states had less than 40 percent: Montana and New Hampshire (Hill, 2024).

As growth accelerated during the COVID-19 pandemic, concerns arose that the availability of face-to-face courses had not returned to 2019 levels, potentially forcing students who prefer traditional environments to enroll in online courses. However, recent research indicates that students are choosing online courses out of preference, not merely due to a lack of face-to-face options.

According to a 2023 study of 7,000 students by Child, Frank, and Sarakatsannis, more than 65 percent of students reported that they wanted to take at least some online courses because of the convenience. However, students continued to air concerns about some online experiences and expressed a strong need for well-organized courses with clear navigation.

With increased competition among institutions offering online programming and a clear need to improve course quality in the post-pandemic era, UX (user experience) and its sibling LXD (learner experience design) are increasingly critical tools for distance learning administrators.

Defining UX and LXD

User experience is about how a user experiences a product or service, ease of use, and the feelings (positive or negative) associated with the interaction. In the everyday world, people encounter these experiences constantly, whether using a remote control, shopping online, or ordering food at a restaurant. In online higher education, a student's experience usually starts when they research an institution or its programs through its website. An inability to quickly find needed information or uninspiring visuals can cause that student to abandon interest in a particular institution or program. (Garrett, 2010)

Learner experience design is related to UX in that it applies to the experience that a student has when navigating a course in a course management system. Like website UX, it includes accessibility, navigability, feelings encountered, and the time it takes to find needed information. A disorganized, cluttered, or unwelcoming course can result in reduced student engagement and diminished success.

Emotional Emphasis of UX and LXD

A defining characteristic of both UX and LXD is an emphasis on emotion, or the feeling that a user or learner has while interacting with a product. The user journey is no longer simply about accomplishing a task but being able to do so in a way that brings satisfaction and delight. In turn, the designer's role is to create this warmth by removing elements of the experience that cause frustration, and then building a positive emotional experience through words, colors, images, sounds, and connection.

Don Norman (2004), who originally coined the term UX, said, "Attractive things work better... people are more tolerant of minor usability issues when they find the experience enjoyable."

To evoke emotions effectively, designers must first understand the users and what they need. In online education, the development of user personas might include a traditional student who tends to procrastinate or a working mother who is coming back to college after a long hiatus. While the mother may seek a sense of belonging and welcoming, the traditional student may need encouragement and fun. (Schmidt & Huang, 2022)

As opposed to a traditional instructional designer who is focused on delivery of content and instruction, the LX designer focuses more on the user—using empathy to consider every touchpoint. Whether it's the use of color to send subtle cues about mood, ensuring that assessments are updated to match current materials, or projecting positive emotions in instructional videos and feedback, an empathetic designer will create an environment where learners joyfully anticipate their regular participation (Liu & Wang, 2024; Kahu & Nelson, 2018).

Basic Solutions for Improving UX for Enrollment

UX continues to emerge, integrating concepts from cognitive psychology, graphic design, computer science, communications, and marketing. Professionals come from a variety of backgrounds, but generally recognize basic common principles for using empathy to continuously improve user experiences.(Schmidt & Huang, 2022) Many of these can be readily applied to the websites that enroll prospective students and support current online students.

Understand the visual importance of first impressions to create a sense of safety, warmth and belonging.

The initial encounter that a prospective student experiences cannot be overestimated. In the first five seconds of viewing a university's online website, subtle visual cues will result in the user feeling a sense of interest and belonging or apathy or annoyance.

Among the most important considerations are the usage of color, an emphasis on simplicity, and the avoidance of stock "canned" photography. For a university whose team colors evoke anxiety or negative feelings (red, black, bright yellow), branding teams must consider complementary colors that can be used in primary visuals (Elliott & Maier, 2014).

The ubiquity of free professional stock images has also resulted in overuse, duplication, and perceptions of inauthenticity. The common photo of a student looking into a microscope in a lab no longer evokes "prestigious academics," but now simply says "template." According to Stackla (2018), consumers perceive more than half of the brands that they encounter online as inauthentic.

Solution: Eliminate or reduce stock photography, particularly on primary pages. Utilize candid shots of real students or staff in their natural environments. Be purposeful in the selection of colors and white space to increase user feelings of joy.

Reduce content. Reduce it again.

Over time, websites can become overloaded with content. Contributors and editors continue to add but fail to take away. Navigation drop-down menus go from having three links to seven. The result for the user is increased cognitive overload and a decreased interest in the product or service. Results of website search tools may often yield outdated, irrelevant results. (Dvir & Gafni, 2022)

However, it is paradoxically easier to add than it is to remove. This lean concept is also applicable to written content. Every word should count.
Solution: Perform a spring (and fall) cleaning of web content, discarding outdated pages or content that is no longer highly relevant. Pay particular attention to navigation menus, prioritizing what is most important to the user, and eliminating or combining other elements.

Perform quarterly audits of information to identify redundancies and eliminate them.

Ensure that written content is concise and clear while still conveying the appropriate emotion. One strategy is to take any draft of written web content and try to reduce it by half. Integrate the concept of the plain language movement to ensure that technical terms or industry jargon are easy to understand.

Identify and eliminate sticking points in time to task and accessibility

Eliminating simple barriers is one of the easiest improvements in UX for websites, but audits are often infrequent. There are many tools and even AI analyses that can immediately find broken links, assign readability scores, and look for accessibility issues. (Alzpurua, Harper, & Vigo, 2016)

However, other sticking points, particularly at critical points in the customer conversion process, can be more difficult to quickly identify. This is where testing can be particularly useful in having prospective students who are not familiar with the website try to complete a task such as applying for a degree program. Some of the problems uncovered are too many clicks to arrive at the destination, forms that don't work properly or are unnecessarily lengthy, unclear instructions or navigation regarding which application to use, or a lack of contact information to contact a real person. In addition, many institutions have added request forms as a required step to applying. These may be beneficial in getting a student on a recruiter's list, but may also lose the many students who simply wish to apply quickly.

Solution: Regularly use simple tools to assess readability, accessibility, and broken links. Conduct user research with even a small sample to explore pain points that students experience when attempting to find and complete an application. UX researchers can also use A/B testing with prospective students.

Build confidence and community through learner-centered design

Once a student is enrolled and enters the course, the principles of learner experience design become paramount. If the learner is confused, overwhelmed, or disheartened in their first few minutes in the online course shell, engagement and performance are likely to suffer. Students often associate these experiences with the institution itself—not just the instructor or course designer.

The LXD approach centers the course around the learner's needs, not just content delivery. It considers how students feel when they first log in, how easily they can find key materials, and whether they feel a sense of presence and support. This can be enhanced by clearly organized modules, warm and concise welcome messages, intuitive navigation, and visible instructor presence (via announcements, video messages, etc.). In addition, helping students set goals and feel early momentum can increase motivation.

Solution: Incorporate design thinking strategies that involve student feedback early and often. Use course templates or shells that follow best practices in layout, consistency, and accessibility. Allow instructors to personalize within a framework that supports universal design for learning (UDL). Use real-time student analytics (where available) to identify drop-off points or content areas that may need additional clarity or redesign.

Be obsessive with authenticity.

While an online classroom ideally provides a rigorous and meaningful experience, such expectations do not necessarily equate to a formal tone. Eigenraam, Eelen & Verlegh, (2022) found that engagement in any type of website increases with a sense of entertainment. In an online course, the separation of instructor and student can lead to a feeling of disconnection. Bringing in elements of fun and personality enhances the student perception of authenticity.

Solution: Include elements of entertainment in landing and informational pages as well as in online courses. Encourage faculty to share interesting details of personal experiences in their interactions and course announcements.

Conclusion

In the post-pandemic landscape of online education, where competition is high and expectations are rising, distance learning leaders must move beyond traditional approaches and adopt user- and learner-centered frameworks that prioritize emotion, empathy, and efficiency. By applying the tools and mindsets of UX and LXD to both enrollment pathways and course design, institutions can better attract, retain, and empower online students—turning digital interactions into meaningful educational experiences.

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Developing Effective Online Instructors: A Practical Application of the Community of Inquiry Model

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Abstract

This paper outlines the course, Essentials of Online Teaching, at Penn State's World Campus. The course leverages the Community of Inquiry (CoI) model to quickly develop effective online instructors by focusing on four key behaviors: communication, facilitation, feedback, and fostering a climate of belonging. The course aims to address the needs of instructors new to online teaching, helping them improve student community and retention. Institutions with well-designed courses that meet quality assurance criteria for course design but face the challenge of quickly developing effective online instructors may find this approach valuable for replication or adaptation.

Introduction

As the demand for online programs continues to rise, so does the demand for effective instructors who are able to meet the needs of a rapidly evolving student population. Conversations with academic partners and students have identified the need for emphasis on online pedagogy, instructor presence, and student engagement. To address these demands, World Campus Online Faculty Development has begun a systematic revision of our course portfolio starting with our introductory course, Essentials of Online Teaching. The underlying framework for this work is the practical application of the Community of Inquiry (CoI) model that focuses on four online teaching behaviors—communication, facilitation, feedback, and fostering a climate of belonging. Other institutions who have well designed courses that meet quality assurance criteria but face the challenge of developing effective online instructors quickly may be interested in replicating or adapting this approach.

The Community of Inquiry model by Garrison, Anderson, and Archer (2000) fulfills the stated needs of our academic programs and students. As our instructor participants come from a variety of backgrounds— academic, industry, technical experts, non-native speakers of English— many of whom have never learned, let alone taught online, it was imperative that we design an approach grounded in evidence but designed for instructors not interested in esoteric pedagogical theory. 25 years after its inception, CoI remains a leading framework for online teaching and learning practitioners (Fiock 2020; Hulett and Gray 2023; Garrison 2022; Akbulut, et al. 2022).

Community and (Online) Learning

Dewey's (1938) reflective thinking cycle (problem → exploration → integration → resolution) emphasized inquiry as a collaborative, reflective activity requiring dialogue and shared problem-solving. Any development of the individual, including educational development and specifically higher order development, is best achieved in a community. The CoI model applies this philosophy to the online learning environment establishing that "participants . . . construct meaning through sustained communication" (Garrison et al., 2000, p. 89). Swan et al. (2009) establish the connection between Dewey's theory and its influence on the CoI model.

They write:

The CoI framework is a dynamic model of the necessary core elements for both the development of community and the pursuit of inquiry, in any educational environment. Its three core elements— cognitive, social and teaching presence— … are viewed as multidimensional and interdependent ... At their core is the unity of a collaborative constructivist learning experience consistent with the legacy of John Dewey (5).

The three presences— cognitive, social, and teaching presence— within the CoI model are interdependent, often visualized as a Venn diagram (Garrison et al., 2000). Each are critical to community in the online learning environment. Social presence is "the ability of participants in a community of inquiry to project themselves socially and emotionally, as ``real'' people (i.e., their full personality), through the medium of communication being used" (Garrison et al., 2000, p. 94). Research has established that both instructor and student presences are a part of social presence in the course (Pollard & Swanson, 2014; Rovai, 2000). Cognitive presence is the ability of participants to construct meaning while interacting with course content and their community. Garison et al. (2000) qualify, "As essential as cognitive presence is in an educational transaction, individuals must feel comfortable in relating to each other" (94). Teaching presence is described as the "binding element" in CoI, the presence of an expert who guides and illuminates (Garrison et al., 2000). It encompasses course design, facilitation, and the direction of cognitive and social processes.

Factors Influencing Design

During the early 2010's, World Campus Online Faculty Development courses were designed to mimic the asynchronous online experience of our World Campus students, albeit in an abridged version. Our audience, at that time, was mostly faculty members who were both authoring courses and preparing to deliver them. For that reason, our Essentials of Online Learning course contained a mixture of design and teaching topics. Designed courses were passed from one faculty member to another within academic departments, with many new instructors wanting to redesign parts of the course to fit their teaching philosophy.

In 2023, Online Faculty Development met with academic partners who required all instructors to complete The Essentials of Online Learning course prior to teaching. The goal was to obtain course design feedback. An overwhelming number of participants indicated that the focus of the course should be solely on instruction and not on course design. They further expressed that course design content was not relevant to their part-time instructors who would never be asked to design or make changes to the courses they teach.

At the same time, World Campus experienced a dramatic increase in traditional-aged students in their programs. From the '19/'20 to the '24/'25 academic years the average age of dropped from 31 to 29 while the percentage of undergraduate students, which consistently trend younger, rose from 23.4% to 36.3% across the same academic years (World Campus Fast Facts Dashboard, 2025). (Note: these statistics are from an unpublished, World Campus internal report and do not represent official university data.)

An internal qualitative focus group study on student retention of World Campus faculty members and students conducted by World Campus strategic planning and an external consultant framed two foci pertinent to Online Faculty Development courses: What are the keys to students staying enrolled? And what are the keys to students' academic performance? Traditional and adult learners in the survey stated different enrollment and academic challenges. In general, adult learners indicated non-academic challenges and the need for greater flexibility to accommodate conflicting responsibilities. Traditional students indicated more academic challenges such as workload, instructor facilitation, timely feedback and connection to Penn State resources. These are all factors Online Faculty Development could address in a new course.

Operationalizing the Community or Inquiry Model

As a part of an institution of higher education, Online Faculty Development grounds course content in academic literature and evidence-based practice. However, as a development unit that is charged with rapidly upskilling instructors, we recognize that our mission is not to teach the literature and theories as an academic subject. Our

mission is to quickly prepare instructors to be effective online instructors, not prepare them for academic discourse in pedagogy. One approach to preparing effective online instructors is to provide frameworks related to theory that allow instructors to rapidly understand the desired behaviors in an online classroom and to promote evidence based, best-practice examples.

To help our instructors efficiently prepare we developed a four-week course containing the following four modules:

1. Being Present and Engaged,
2. Fostering a Climate of Belonging,
3. Preparing to Teach Online, and
4. Developing a Reflective Practice.

The first three modules operationalize the CoI model and are discussed below.

Being Present and Engaged

This module grounds our participants in the CoI model with a brief overview of the model that underscores the importance of community and the three presences. During the introduction of CoI, participants are asked reflection questions about each presence to prompt them to consider instructor behaviors in the online classroom that foster a sense of community.

Table 1

Definitions of the presences within the CoI model and reflections questions as they appear in Essentials of Online Teaching

Presence	Definition in the Course	Reflection Question
Social	The degree to which the learner feels connected to the instructor and their peers	How might an instructor create social presence in an asynchronous online classroom?
Teaching	Course design, facilitation, and the direction of cognitive and social processes.	What is the right level of instructor participation in asynchronous discussions?
Cognitive	The ability of learners to construct meaning through discourse and reflection within their community	Where does cognitive presence occur in the asynchronous online classroom?

After the introduction to CoI, the course presents the three key behaviors needed to develop strong social, teaching, and cognitive presences— communication, facilitation, and feedback— chosen to operationalize the behaviors that contribute to community and effective online teaching.

Figure 1

Instructor presence in an online course

In the course, communication is defined as *the regular messages that you send about course logistics, assessment criteria, and outcomes*. Facilitation is described as *the act of using your expertise to keep your students engaged in the right ways with each other and content*. And feedback is *observations provided to the student about performance on activities and assessments that are specific, actionable, timely, balanced and consistent*.

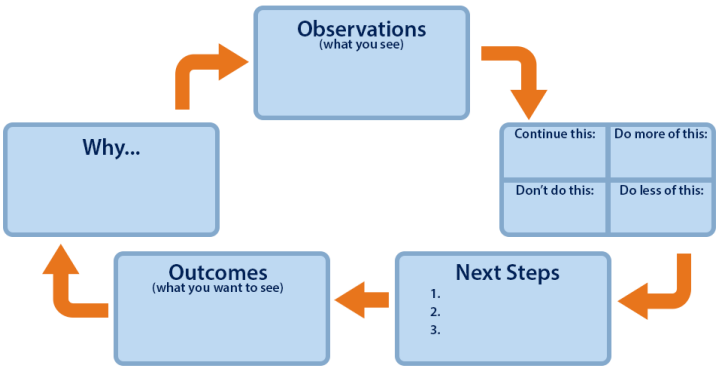
In this framework communication encompasses both social presence and teaching presence. Participants are encouraged to reflect on the aspects of personal and professional identity that they want to project in the course. They are also asked to plan a communication cadence. Communication also impacts teaching presence as participants identify at what point guidance is needed about course logistics.

Facilitation is firmly grounded in teaching presence. Participants reflect on approaches for discussion board facilitation, are encouraged to set explicit expectations for interactions in the course, identify sections of the course in which students may have barriers to learning, gather guidance and supplemental materials, and reflect on modeling inclusive behaviors.

Feedback contains elements of both teaching and cognitive presence. Effective feedback should both guide students about where to find resources to improve (teaching presence) and direct the cognitive process to improve learning (cognitive presence). We present the framework for effective feedback developed by Zelinski et al (2019) as a model to achieve feedback that is specific, actionable, timely, balanced and consistent (Zelinski et al., 2019). Figure 2 shows this model adapted from the publication. Participants practice effective feedback by using the model to revise poor feedback.

Figure 2

The framework for effective feedback adapted from Zelinsky et al. (2019)



This framework encompasses many of the best-practice techniques that one would typically find in a course for online instructors. Fendler (2021) writes, "The most common techniques used by online teachers to achieve presence are frequently posting written announcements [communication], providing clear written instructions on assignments [facilitation], offering students meaningful written feedback [feedback], and timely responding to emails [communication]" (para.1). Instead of a laundry list of techniques, however, the framework focuses the participants' attention primarily on behaviors, with examples of evidence-based techniques provided in the course and presented by participants in discussions.

Fostering a Climate of Belonging

Garrison (2017) writes that CoI is a "Collaborative experience which includes a sense of belonging and acceptance in a group with common interests" (p. 35). The second model focuses on techniques to help the instructor foster belonging in their course. Course participants reflect on their beliefs about teaching and students, examine course policies and interaction guidelines, and read about techniques for fostering a climate of belonging adapted from *How Learning Works* (Ambrose et al., 2010). As World Campus Students are highly diverse— representing not just diversity of culture and identity but also diversity of age, experience, and educational goals— participant instructors are encouraged to teach the whole student and are presented resources about the needs of specific populations attending World Campus courses.

Ambrose et al. (2010) writes,

[I]t is important to recognize the complex set of social, emotional, and intellectual challenges that college students face. Recognition of these challenges does not mean that we are responsible for guiding students through all aspects of their social and emotional lives... However, by considering the implications of student development for teaching and learning we can create more productive learning environments. (p. 134)

Preparing to Teach Online

Module 3 presents general tips for orienting yourself to a new course, information about time management, and institutional resources. The sections on institutional resources contain crucial knowledge for an instructor in a CoI because the instructor is the bridge between the course community and the larger institutional community. Knowing who to direct students to at the library, where students get general tech support, where to go for support with course technology when there is a problem, how to implement academic adjustments are examples of crucial skills that aid in course facilitation. In addition, instructors are considered more than just teachers and experts in the field. Students often view an instructor as a leader, mentor, and guide in their academic experience. Instructors may encounter students experiencing personal issues or extenuating circumstances such as the sickness of a loved one or a natural disaster in their section of the world. While instructors are not expected to be counselors, knowing what resources to direct students to in times of need is important to the CoI. A recommendation to the correct resource may make the difference between stopping out and finishing a semester.

Conclusion and Opportunities for Research

Essentials of Online Teaching is designed to meet the need to quickly and efficiently upskill online instructors at a large research institution with a mature instructional design unit. Comparative research should be done that explores the similarities and differences among our framework and others that use the CoI model.

Barriers still exist to reaching part-time instructors who may not be compensated for time spent on a month-long asynchronous professional development course. Further study into alternate approaches is warranted to ensure that these individuals receive both educational support and compensation for their time and effort.

Finally, there is limited direct research specifically examining instructor knowledge of institutional resources within the CoI framework. Although the connection is logical and supported by broader research, there is a need for more targeted studies that explicitly examine how instructor knowledge and proactive use of institutional resources impact the development and sustainability of a CoI in online courses.

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Ready or Not, the Deadline is Coming!
Getting Onboard with Accessible Course Content

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Abstract

People with disabilities often have less engagement with and access to online resources (Lissitsa & Madar, 2018). Accordingly, the Department of Justice's (DOJ) Final Rule (89 FR 31320, 2024) for Title II of the Americans with Disabilities Act of 1990 (ADA) requires many public educational institutions and others to comply with the Web Content Accessibility (WCAG) Guidelines Version 2.1 AA by April 24, 2026. Compliance officers and technology specialists across the country have been working to make sure institutional websites and apps meet the Guidelines. Despite spirited debate during the rulemaking process, the updated rule also requires instructional content within Learning Management Systems (e.g., documents, slide decks, audio, videos) to be compliant. The purpose of this paper is to shed light on the duty to make digital course content accessible, and to provide insights for creating and updating course content to be usable by all.

Title II of the Americans with Disabilities Act

Millions of Americans live with a disability, including hearing, vision, cognitive, walking, self-care or independent living difficulties (Leppert and Schaeffer, 2023). Recognizing that physical and mental disabilities "in no way diminish a person's right to fully participate in all aspects of society" (42 U.S. § 1201(1)(A)), the Americans with Disabilities Act (ADA), (Pub. L. No. 101-336, §2, 104 Stat. 328, 1990) was enacted to reduce obstacles in employment, education, housing, and other areas of life for people with disabilities. Yet, for decades, federal regulations have long failed to identify specific standards for accessibility of online content. Nearly 20% of U.S. college students report having a disability (Swiader, 2025). In education, website and digital content has been deemed accessible on the broad definition of whether a person with a disability had the "opportunity to acquire the same information, engage in the same interactions, and enjoy the same services as a person without a disability in an equally effective and equally integrated manner, with substantially equivalent ease of use" (U.S. Department of Education, 2013, p. 1). In 2024, this regulatory gap was finally addressed by the Department of Justice.

The New Rule

The Department of Justice (DOJ) Final Rule (89 FR 31320, 2024) for Title II of the ADA requires most public higher education institutions in the United States make their digital content and web-based applications (apps) accessible by April 24, 2026 (USDOJ, 2024). Although certain archived content may be excepted, the Final Rule applies to new and in-use instructional content such as documents, slide decks, audio, and videos. With an aim to provide equal access to educational resources and opportunities for all students, regardless of their abilities, the Final Rule adopts the Web Content Accessibility (WCAG) Guidelines Version 2.2 AA ("the Guidelines"). These technical standards were developed by the World Wide Web Consortium (W3C) and have been widely adopted by a number of entities.

In short, the Guidelines focus on four main content principles:

1. Perceivable: Digital information must be presented in a variety of ways so users can perceive it. For example, images should be configured with alternative text ("ALT-TEXT") for those with vision impairments, and videos should include closed captions for the hard of hearing.
2. Operable: The user interface and navigation must be functional from a keyboard, providing users enough time to read and use digital content, and helping them navigate and find content.
3. Understandable: Information should be presented in a consistent way and operation of the interface must be intuitive, with web pages that appear and operate in predictable ways to help users avoid and correct

mistakes.

4. Robust: The content must be robust enough to be interpreted reliably by a wide variety of users and assistive technologies, such as screen readers.

Administration and Faculty Roles

Digital content that is accessible, usable, and beneficial to everyone lays the foundation for measurable student success. Administrators must develop and implement comprehensive policies that align with the Guidelines, setting clear expectations for digital content accessibility across the institution. Sufficient funding will be needed for technology tools, support personnel, and training. Processes must be developed for monitoring accessibility and addressing any gaps or issues that arise. For maximum efficiency, administrators should promote collaboration and communication between departments, ensuring all stakeholders are well-informed and involved in accessibility initiatives. Finally, effective training and implementation strategies must be developed and deployed to ensure course-related webpages and materials meet the Guidelines' requirements. In doing so, institutions demonstrate a student-centric culture, foster an inclusive learning environment, and provide important professional development for faculty.

While institutional leadership is ultimately responsible for ensuring compliance with Guidelines, making online content accessible requires a coordinated effort between administrators, technology specialists, instructional designers, and faculty. Most institutions began the process with a thorough audit of their digital platforms, webpages, and apps, making accessibility updates and edits as needed. Third-party service providers whose tools may be integrated into the website, app, or learning management system (LMS) must be vetted for alignment with the Guidelines, as well. Continuous monitoring by support teams and digital accessibility specialists will be key in ensuring ongoing compliance in all digital forums. When it comes to course-related content, the task becomes even more complex. In addition to a broad variety of materials constantly being created, uploaded, and stored by potentially hundreds of individual faculty members into a variety of platforms, the sheer volume courses offered at any given time makes it impossible for most institutions to reach compliance without full and active faculty participation.

Although faculty are directly responsible for curriculum and course materials, only 24% report receiving training on accommodating students with disabilities (Swiader, 2025). As more students with disabilities enter higher education, the need to coach instructors in creating accessible materials and assessments becomes pronounced (Lombardi, McGuire & Tarconish, 2018). Targeted training (e.g., workshops, webinars, tutorials), self-directed learning, and collaboration between faculty, instructional designers, and the educational technology team are critical to achieving digital accessibility. Through intentional team effort, course materials can be developed or revised to be both accessible and engaging for all students.

Accessible Course Materials

Digital accessibility is fundamental to fostering an inclusive learning environment. While accessibility is more frequently emphasized in online courses, it is often overlooked when developing digital content for traditional courses, leading to significant barriers for students with disabilities (Kinash et al., 2004; van Rooij & Zirkle, 2016). Under the Guidelines, every digital component of a course—whether a syllabus, lecture slides, video, discussion forum, or even a simple course announcement—should be designed with accessibility in mind. In addition, learning tools beyond the LMS, such as Slack, GroupMe, or other collaborative platforms, should be accessible. Failure to ensure accessibility of all tools and content creates inequitable learning conditions, where some students may have access to course materials and engagement opportunities that others do not.

Some faculty may be familiar with universal design for learning (UDL), a pedagogical approach that focuses on meeting the needs of a broad range of learners (e.g., Brugstahler, 2020; Lombardi, McGuire & Tarconish, 2018). A key principle of UDL involves providing information that is equally perceptible to all learners by way of offering the same information through different modalities such as video transcripts, and via a format that allows the user to make adjustments, such as enlarging text or increasing audio (CAST, 2024). Not surprisingly, this aligns with the Guidelines' first content principle – making digital content perceivable – which is the area where the crux of accessibility-related work for faculty resides. Below is a checklist that may find useful in identifying ways to make most digital course content usable by all learners:

1. Documents (PDFs, Word, and Other Text-Based Files):

a. Use heading structures to improve screen reader navigation.
b. Ensure high contrast between text and background (Smith & Ruvolo, 2021).
c. Include descriptive alternative text for all images, graphs, and charts.
d. Validate accessibility using tools like Adobe Acrobat's Accessibility Checker (Adobe, 2024).
e. Offer content in alternate formats.
f. Identify whether your university LMS has an internal accessibility checker.

2. Slide Decks (PowerPoint and Google Slides):
    a. Provide meaningful slide titles and use accessible templates with headings and lists.
    b. Include descriptive alternative text for all images, graphs, and charts.
    c. Enable closed captions for embedded media.
    d. Avoid using color alone to convey information.
    e. Offer content in alternate formats.
    f. Avoid flashing GIFs and excessive animations that may impact usability (Robinson, 2019).

3. Audio and Video Materials:
    a. Ensure closed captions and transcripts are available.
    b. Provide audio descriptions for video content where visual information is necessary for understanding that content (National Federation of the Blind, 2024; Beltis, 2025).
    c. Use video players that support keyboard navigation.
    d. Offer content in alternate formats.
    e. Use only video platforms that support accessibility features, such as adjustable playback speeds, keyboard navigation, and screen reader compatibility.

Accessibility is an ongoing process. Once developed, faculty must regularly update and maintain their content to ensure it remains accessible as guidelines and technologies evolve (Wentz, Jaeger, & Lazar, 2021). Faculty should be pro-active in maintaining currency in accessibility processes and actively engage with students to understand their accessibility needs, making adjustments to instructional materials as appropriate.

Conclusion

Digital accessibility is a crucial step towards creating an equitable and inclusive learning environment for all students. By adhering to the WCAG Guidelines and actively involving faculty in the process, higher education institutions can break down barriers and provide equal access to educational resources. This collaborative effort not only fulfills legal obligations but also fosters a culture of inclusivity and excellence. As technology continues to evolve, a sustained commitment to accessibility will be essential in empowering students with disabilities to fully participate and thrive in their academic pursuits.

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The Impact of Increased Smartphone Usage on Online College Learning

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Abstract

This presentation investigates the impact of increased smartphone usage on online college learning and offers strategies for adaptation. It highlights both benefits, like flexibility and accessibility, and challenges, such as distractions. Recommendations include optimizing content for mobile devices, incorporating interactive elements, and fostering time-management skills to enhance student engagement.

Rise of the Smartphone

Smartphones represent a unique form of technology that while not technically a computer, can perform many of the functions of one with the added advantage of mobility. The beginnings of the smartphone can be traced to IBM's Simon Personal Communicator which was introduced in 1992 and included a touchscreen and was able to make phone calls and send emails along with a few other basic applications. Between 1996 and 1999, both Nokia and Blackberry produced mobile devices with internet capabilities. In 2008, Apple introduced its iPhone followed shortly after with Google's Android operating system. Today, 91% of U.S. adults own a smartphone and 15% of U.S. adults rely on smartphones as their only internet source (Pew Research Center, 2024). With the widespread use of smartphones, significant attention has been given to the impact of smartphone usage on the human psyche.

Smartphones and Cognitive Functions

A significant amount of research has been conducted regarding the impact of smartphones on people with mostly negative implications. Smartphone usage has been associated with poor sleep quality and life satisfaction (Demirci et al., 2015), as well as loneliness and depression (Boumosleh & Jaalouk, 2017). One of the challenges of understanding the impact of smartphones is isolating the variable from the other modern phenomenon of social media. Namely, what are the negative impacts from the smartphone or the content the smartphone conveys? It is certainly true that excessive smartphone usage has isolated individuals from daily face to face interactions. Excessive use of smartphones can also lead to sleep disruptions which negatively impact cognitive functions. Similarly, the use of smartphones by college students has also drawn considerable attention.

Smartphones in the Online College Classroom

The impact of students in the classroom has proven to be mostly negative. In a recent study by Huey and Giguere (2022), it was determined that college students who used smartphones during class showed lower levels of comprehension and mindfulness and higher levels of anxiety than students who did not. Certainly, anything that distracts from focusing on a lecture or other classroom function will decrease attentiveness and comprehension. But what about as a replacement for the traditional computer? Smartphones have made it easier for students to access educational resources. Web and application developers have been responding to the demand by providing educational tools. Textbook publishers have made their digital content available to mobile technology. Thanks to these developments, an increasing number of online college students attempt to complete basic classroom functions with their smartphones rather than tablets, laptops, or personal computers. A study conducted in 2022 (Sage., K et al.) compared the use of smartphones versus a laptop among college students performing basic tasks and found the following:

- Students performed the same tasks with similar speeds on laptops and smartphones.
- Students demonstrated higher satisfaction when using a laptop.
- Students found that laptops require less effort than smartphones for the same tasks.
- Students found that misuse and distractions are a far greater issue with smartphones than laptops.

This study focused on simple tasks. A growing concern is when students rely on smartphones for more complex tasks such as essay and discussion post writing.

Implications for Instructors and Course Designers

Almost all students own smartphones and use them in some form with their education. The level of use ranges from occasional use such as class emails or checking grades to extensive use in attempting all classroom functions including assignments. Students may view their smartphone as a "backup" for their computer if they find themselves without its use deeming it better to accomplish the task on time with the smartphone than late with their computer. Some functions are noticeably easier with a smartphone such as submitting screenshots, video, or voice recordings. A problem arises when students attempt to perform more complex tasks such as writing with a smartphone. While some technologies such as voice to text could be useful, the difficulty in viewing sources while writing makes smartphones far less conducive for synthesis and evaluation. Given the advantages and disadvantages of smartphone usage, some implications become apparent:

- Schools should create and maintain applications for students to access records and school communications such as emails via smartphones.
- Online instructors should communicate with students the disadvantages of relying on smartphones for some task completions such as writing.
- Course designers should consider the likelihood of students depending on smartphones for classroom tasks such as reading and should utilize these resources accordingly.
- Healthy smartphone habits should be encouraged and taught as part of student success/orientation efforts.

Conclusion

Online higher education has focused on designing and delivering education with the assumption that students would utilize a laptop or personal computer to complete studies. The prevailing use of smartphones and the growing number of mobile educational tools has challenged this assumption as more students are reaching for their phones to complete course activities. While some activities perform equally well with smartphones, many are not which raise a challenge for not only students but instructors and course designers. The latter must be mindful of this shift by developing and delivering course content accordingly.

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Life Beyond Essays:
Rethinking Alternatives to Written Assignments

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Abstract

The sudden rise of artificial intelligence forced higher education to respond to concerns about plagiarism quickly. Another issue is the growing perception that writing is a skill easily replaced by AI and, thus, is not worth developing. This open discussion will explore alternative assessment methods to essays, which have been online education's "bread and butter" for decades.

Addressing the Artificially Intelligent Elephant in the Room

The reality is that by the time it takes to type this sentence, artificial intelligence (AI) tools like ChatGPT could produce a lengthy academic paper on the subject, complete with sources (which may or may not indeed exist). Perhaps even more disconcerting: it only takes just a few seconds more for AI to create a robust online course complete with objectives, outcomes, discussion prompts, assignments, and lecture content. The rapid use of AI has disrupted and enhanced multiple facets of life. It is revolutionizing science, medicine, the military, and many other fields with incredible speed. The creative endeavors of humans can now be replicated with increasing quality by AI. Photography, video, music, literature, and all forms of writing are being produced quickly and dramatically. The relative ease of producing academic essays on any subject has created a crisis in higher education. The primary concern has been plagiarism and the ability of students to bypass the main form of assessment in higher education, especially distance higher education. The growing fear is that as reliance on technology increases, the skills that come with developing written skills could also be lost.

Advantages and Disadvantages of Moving Curriculum away from Written Assignments

Given the nightmare of plagiarism concerns created by AI and the ease with which hours of writing can be replicated in seconds, it is no wonder that many course designers are beginning to focus less on writing and more on other forms of assessment. After all, if there is no essay assignment, then there is no need to worry about students using AI to complete it. Yet this solution is not as simple as it may first appear. The vast majority of scholarly literature supports the belief that writing is a vital source for developing communication and critical thinking skills (Aljuaid, 2024). However, eliminating written assignments risks losing a key tool in developing these skills.

Using AI with Written Assignments

Aljuaid (2024) notes that a growing body of research shows that AI tools such as Grammarly can enhance student writing. AI tools can also be used to develop ideas, including research questions, and help with organization. Reliance on AI risks impeding the development of writing and thinking skills. There is the potential risk of over-

reliance on technology, which could undermine the development of important critical thinking skills (Fuchs, 2023). A balanced approach could be seen using appropriate AI tools for feedback, idea generation, and evaluation. Ethical concerns remain regarding authorship attribution and the collection of private data. Some possible ways to incorporate AI with written assignments may include the following:

- Use AI to check and improve student writing with feedback on grammar formatting, freeing instructors to focus on logic and evidence analysis.
- Use AI to generate ideas to help students begin writing.~~,~~ As students sometimes, students find it difficult to generate ideas or find inspiration (Chan and Hu, 2023).

The key would be not simply assigning high point values to written essays in the final form, which AI can quickly produce and thus continue the plagiarism apocalypse currently gripping online higher education. As stated by Times Higher Education (2023),"Teaching is rapidly changing. By embracing new technologies, and learning how AI can complement teaching, we can prepare students for a future where they will be able to compete with the best and brightest, (p.1).

Create Alternatives to Written Assignments

While it is not suggested that all writing be eliminated, it does stand to reason that alternative means of assessment should be explored, given the complex reality of AI. While it may not be possible to fully "AI-proof" any course, some possible alternatives are:

- Objective Quizzes and Exams: Traditional exams remain an option, though online use requires complicated proctoring mechanisms.
- Video Presentations: Eliminates some issues, but AI can still produce narration.
- Infographics: Visual assignments that use graphic tools can be practical but increasingly easily created by AI.
- Project-Based Assessments: Long-term projects, including community activities, are very promising in their ability to apply knowledge and are not easily replicated with AI.
- Photo Essays: A collection of images arranged to tell a story or convey a message. It combines photography with minimal text to provide context, guide the narrative, or enhance the emotional impact. Photo essays can focus on various topics, such as social issues, personal experiences, historical events, or artistic expressions.
- Storyboard: A sketch sequence outlining a concept, historical event, or process.
- Podcast Episode: An audio recording discussing a topic, interview, or debate.
- Debate or Panel Discussion: Presenting different perspectives on an issue.
- Interactive Presentation (Prezi, Canva, Google slides, etc.): A dynamic way to present research or findings, AI can still produce narration.

Conclusion

The rise of AI has called into question the benefit of learning to write when technology can accomplish the same task in a fraction of the time. Yet educators remain convinced of the benefit of learning to write and developing the accompanying thinking skills. Because of growing concerns regarding plagiarism and AI, instructors and curriculum designers must consider alternatives to the traditional college essay as the primary means of assessment. A blended approach that includes instructing students on the ethical use of AI tools in writing and creative approaches to evaluation will provide the best of both worlds.

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Exploring the Efficacy of Virtual Research Mentorship for Online Undergraduate Projects

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Abstract

Virtual undergraduate research mentorship is gaining traction, offering key support for student participation in high-impact research. However, limited research exists on its effectiveness. This study features an examination of faculty mentorship in online undergraduate research using the validated Mentoring Competency Assessment. While mentors rated themselves highly, mentees rated them even higher, suggesting effective virtual mentoring in combination with potential mentor self-confidence issues. These findings support virtual mentorship's value and highlight areas for targeted professional development.
Keywords: virtual mentorship, undergraduate research, mentor competencies.

Exploring the Efficacy of Virtual Research Mentorship for Online Undergraduate Projects

Undergraduate research is a high-impact practice, defined by the Council on Undergraduate Research (CUR) as "a mentored investigation or creative inquiry conducted by undergraduates that seeks to make a scholarly or artistic contribution to knowledge" (Undergraduate Research Definition Task Force, n.d., para. 1). Mentorship is central to this experience, benefiting both students by improving research persistence (Cooper et al., 2019) and self-efficacy (Estrada et al., 2018; Sams et al., 2015) and faculty, who gain research assistance, mentoring skills, and student feedback (Faulconer et al., 2020a; King & Imai, 2022). However, mentoring presents challenges, including personal, student-centered, and institutional barriers (Faulconer et al., 2020a; King & Imai, 2022). Undergraduate curricula may lack research integration (Adebisi, 2022), and adjunct faculty, often students' closest content experts, may have limited research experience. A central motivation to this research is to better understand how mentors evaluate their own competencies and how mentees perceive their guidance within a fully online, globally dispersed undergraduate research mentorship program. In this model, research mentors and supervisors fulfill distinct roles. The investigation seeks to answer: 1) *Do mentors self-perceive strong competencies across all six mentoring domains?*; 2) *Do mentees perceive strong competencies in their mentors?*; and 3) *Is there strong alignment between mentor self-assessments and mentee evaluations?*

Literature Review

Research often conflates the roles of a research mentor and supervisor, despite their distinct functions. While both share responsibilities, mentorship emphasizes long-term professional growth, guiding students from research curiosity to engagement, while supervision provides disciplinary expertise for project execution. The National Research Mentoring Network defines mentoring as a structured, evolving relationship focused on career progression (NRMN, n.d.), yet there remains a need for clearer definitions, role delineation, and relationship context (Pfund, 2016). Addressing faculty barriers to undergraduate research support could involve separating mentorship from supervision. Mentors would foster skill development, self-reflection, and career readiness, while supervisors focus on project-specific expertise. Virtual research mentorship is gaining attention, with models like mentor

constellations and cohort mentoring showing promise (Hall et al., 2021; Johnson & Knox, 2022). Benefits include improved research understanding, employability, and inclusivity, especially for underrepresented groups (Faulconer et al., 2024; Knox et al., 2023), though direct comparisons between virtual and in-person mentoring remain scarce.

Studies highlight discrepancies between mentor and mentee perspectives on research skills and feedback. Mentees often underestimate their abilities, and mentors may lack sufficient interaction to assess skills accurately (Lev et al., 2010; Feldon et al., 2015). Differences in mentoring expectations also influence how feedback is received and applied (Korver & Tillema, 2014). Formal mentor training is critical, but underutilized, with only seven-percent reporting significant training (Stolzenberg et al., 2019). Effective in-person and online training can enhance cultural competence and mentoring effectiveness (Byars-Winston et al., 2020). Efforts to assess mentoring effectiveness have led to tools such as the Mentor Evaluation Tool (Yukawa et al., 2020) and the Mentoring Competency Assessment (Fleming et al., 2013), which aligns mentor and mentee perspectives. Notably, studies reveal gender disparities, with male mentors rating their skills higher than female mentees do, particularly in fostering independence and professional development (Orsini et al., 2019). Addressing these gaps through improved metrics and training can enhance mentoring relationships and research outcomes.

Methods

This study employed a structured methodology, detailing contextual roles, the mentoring program, materials, participant procedures, and the data analysis plan to ensure rigor and coherence. At the subject institution, research mentors and supervisors have distinct roles. Mentors provide long-term guidance, supporting students from initial research interest to project completion through psychosocial, role-modeling, and career functions (Abedin et al., 2012; Pfund, 2016; Thiry & Laursen, 2011). They meet regularly with mentees, often remotely, and coordinate with institutional mentoring programs. Supervisors, typically subject matter experts, focus on short-term project management, methodology, and data analysis, ensuring research completion. Coaching may fall under either role, with mentors emphasizing broader research concepts, such as funding and professional development. The voluntary research mentoring program matches students with mentors based on academic discipline and goals. Mentors typically support 4–8 students, complete online training, and develop a mentoring philosophy. Participants come from diverse STEM fields, including physical sciences, digital humanities, and mathematics.

The Mentoring Competency Assessment (MCA), a validated tool with six subscales (communication, expectations, understanding, independence, diversity, and professional development) was used to evaluate mentor competencies (Fleming et al., 2013; Hyun et al., 2022). A 21-item survey utilized a 7-point Likert scale, with mentors self-assessing skills and mentees rating their mentors. Demographic data were also collected. Following Institutional Review Board approval (#23-103), participants were recruited via email and completed surveys through Qualtrics. The study included 29 respondents (23 mentees, six mentors), with an analyzed sample of eight (six mentees, two mentors). Response rates aligned with prior studies (Orsini et al., 2019; Wisker et al., 2022). Data Analysis focused on mentoring competency using t-tests to compare mentor and mentee ratings across six domains. Mentees were divided into Mentor Groups A and B, with Group C excluded due to mentor non-participation. Despite the small sample size (n=8), analysis provided preliminary insights to guide future research. Ratings of 6+ indicated strong competency, with the null hypothesis assuming an average rating of 6. Rejection of the null hypothesis confirmed perceived strong skills.

Results

This work represents an assessment of mentor and mentee competency perceptions, testing the null hypothesis that their average ratings were equal. Alignment was confirmed, if the null hypothesis was not rejected. Mentor self-assessments across six competencies showed no significant differences between Groups A and B, allowing their ratings to be combined. Mentors rated themselves as strong (mean ≥ 6) in *Aligning Expectations* (6.63, $p \leq 0.05$) and in three competencies at the 0.10 level: *Aligning Expectations, Assessing Understanding* (6.33), and *Fostering Independence* (6.50). Mentees rated their mentors across the same competencies, with scores ranging from 6.44 (*Fostering Independence*, Group A) to 7.00 (*Addressing Diversity*, Groups A & B). No significant differences between mentee groups allowed for their ratings to be combined, leading to the null hypothesis being rejected at both significance levels; the result indicates mentees consistently viewed their mentors as highly skilled. Comparing mentor self-ratings to mentee evaluations, Group A showed alignment in four competencies, while Group B aligned in one (*Aligning Expectations*). In all cases of misalignment, mentees rated their mentors higher than the mentors rated themselves, suggesting mentors either concurred with mentee perceptions or underestimated their own competencies.

Discussion

The analysis of mentor and mentee perceptions identified areas of alignment and discrepancy in mentoring competencies. Mentors rated themselves highly in *Aligning Expectations, Assessing Understanding*, and *Fostering Independence* at the 0.10 significance level, with *Addressing Diversity* and *Promoting Professional Development* averaging 6 or higher. *Effective Communication* had the lowest average (5.75), yet mentees consistently rated their mentors higher across all competencies. While Mentor A's ratings aligned with mentees in four areas, Mentor B aligned in only one, suggesting differences in self-perception rather than skill deficits. *Effective communication* is crucial in mentoring (Bennett et al., 2022; VanAlstine & Holmes, 2018) yet can be challenging in virtual settings due to technological constraints (Owen, 2015). Mentees rated their mentors highly, though mentors saw room for improvement, mirroring in-person findings (Harker et al., 2019). Unlike in-person mentoring, where misalignment is common (Harker et al., 2019; Orsini & Stedman, 2022), virtual mentoring showed stronger alignment; particularly in *Assessing Understanding*, a critical factor in effective mentorship (Greenberg, 2018; Stephenson et al., 2022). However, misjudging mentee knowledge can hinder success, especially in cross-disciplinary mentoring, where targeted training may help. *Fostering Independence* is central to undergraduate research (Pfund, 2016; Walkington et al., 2020), with confidence playing a key role (Greenberg, 2018). While mentees rated this competency highly, one mentor rated themselves lower, aligning with prior research (Harker et al., 2019). *Effective mentorship* requires balancing guidance and autonomy through intentional strategies (Bennett et al., 2022; Ghebreyessus et al., 2022). *Diversity mentoring* also presents challenges as mentors influence career trajectories (Carpi et al., 2017; Jones & Lerner, 2019). Mentees rated diversity mentoring highly, though mentor self-assessments varied from past studies (Harker et al., 2019). *Faculty development* programs can enhance cultural competency (Byars-Winston et al., 2023), supporting diversity through networking and research dissemination (Walkington et al., 2020). Professional development ratings were high, but varied, which is consistent with in-person studies (Harker et al., 2019; Orsini & Stedman, 2022). Work-life balance (Bennett et al., 2022) and access to multiple mentors (Bradley, 2017) further contribute to effective mentoring.

Implications

This study highlights the strengths of virtual research mentoring, while identifying self-perception gaps between mentors and mentees. Mentees consistently rated mentors higher, underscoring the need for structured training to address perception discrepancies and improve diversity mentoring. Not all faculty excel in mentoring (Johnson et al., 2015), but online training enhances ability and confidence (Behar-Horenstein et al., 2019; Weber-Main et al., 2019), improving communication, expectation alignment, and engagement (Young & Stormes, 2020). Strong mentoring boosts research output and student belonging (Morales et al., 2017), with inexperienced students benefiting the most in online settings (Monarrez et al., 2020; Faulconer et al., 2020b).

Key Takeaways, and Future Direction

This work relied on refinement of Pfund's (2016) undergraduate mentoring framework to provide insights into virtual mentoring using a validated mentor-mentee comparison metric. While many institutions adopted virtual mentoring during COVID-19 (Erickson et al., 2022), long-term sustainability remains uncertain. Results exhibit mentor-mentee agreement in key competencies: communication, expectation alignment, assessing understanding, fostering independence, diversity, and professional development. Though a small sample limits generalizability, this study establishes a foundation for future research comparing virtual and in-person mentoring. For future efforts, a larger, more diverse sample would improve statistical reliability. Expanding the sample would allow degree-level comparisons, given that mentoring needs differ between undergraduates and graduate students (Gonzalez, 2001; Butz & Branchaw, 2020). Data from a single institution also limits generalizability, and a small mentor sample prevented analysis of heterogeneity effects. While gender was not a predictor of mentor self-evaluation, larger studies suggest that gender, research area, mentoring frequency, and academic rank may influence results (Mickel et al., 2018; Orsini et al., 2019). Bias is also a concern, as self-reported data may be influenced by social desirability, and voluntary participation could introduce selection bias. Nonresponse error may affect representativeness, though recruitment efforts aimed to mitigate this. Expanding participation would enhance reliability and applicability.

Conclusion

This study offers insights into the competencies of virtual research mentors, including the identification of strengths in areas such as communication, aligning expectations, and fostering independence. However, differences between mentor and mentee perspectives, particularly on communication, suggest areas for deeper exploration. The limited

sample size restricts generalizability, indicating the need for larger, longitudinal studies to better assess the long-term impacts of virtual mentoring. Future research should also focus on how mentor development programs can enhance skills in key areas like diversity management and promoting mentee independence. Overall, this study sets the stage for future research into improving virtual mentoring practices and mentor training.

Declaration of Conflicting Interests

Authors disclose employment at the institution studied as a potential conflict of interest.

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Building a College's Digital Credential Taxonomy: Governance & Organizational Processes

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Abstract

In 2024, the Georgia Institute of Technology (the Institute) launched its seventh College – the College of Lifetime Learning. Coinciding with the launch, we were tasked with implementing a digital credentials strategy recommendation following a six-month technology platform audit. Implementing digital credentials involves more than digitalizing existing academic achievements; it requires systematic innovations within higher education institutions (HEIs) to reflect shifts towards lifetime learning and skills assessment. Understanding digital credentials implementation from strategic, leadership, and operational perspectives can help establish best practices for scalability and maturity prior to wider workforce adoption (Alasmari & Alzahrani, 2024; Howard et al., 2024; Selvaratnam et al., 2024) including ubiquitous adoption of learning and employment records (LER).

Noting ambiguous terminology exists in research (Moore et al., 2024; Randall & West, 2022), digital credentials are defined here as online records of accomplishment, interest, or affiliation, containing metadata describing context, meaning, validation, process, and result (Carey & Stefaniak, 2018; Gibson et al., 2015; Jovanovic & Devedzic, 2015).

Literature Review

Digital credentials in HEIs

A digital credential pairs a visual badge image with pedagogical metadata (Trepulė et al., 2021) signifying both an assessment and achievement of a successful learning experience (Abramovich, 2016; Farmer & West, 2016). Digital credentials offer learner-centered educational artifacts that are granular and stackable (Bean et al., 2023; Grech et al., 2021; Miller et al., 2020). Braxton (2023) provides an overview of digital credentials, their alignment with academic offerings, and future considerations for lifetime learning based on Bloom's taxonomy. Digital credentials can be employed across HEI use-cases: learning motivators (Gibson et al., 2015; Iwata et al., 2017; Newby et al., 2016; Schultz, 2024), academic recognitions (Ian O'Byrne et al., 2015; Jovanovic & Devedzic, 2015), assessment models (Carey & Stefaniak, 2018), and learning pathways (Bowen & Thomas, 2014; Gamrat & Zimmerman, 2015).

Examining HEI digital credentials implementation is crucial to identify and mitigate challenges within this diverse ecosystem. Digital credentials remain in a state of innovation and experimentation, with advancements like learning pathways and digital wallets (Alasmari & Alzahrani, 2024; Bean et al., 2023). HEIs present unique quality and framework differences, resulting in an oversupply of uneven digital credentials (Ahn et al., 2014; Alasmari & Alzahrani, 2024; Chakroun & Keevy, 2018). HEIs face sustainability and maintenance challenges for long-term digital credentials usage (Gamrat & Bixler, 2019; Raish & Rimland, 2019; Stork et al., 2022). These challenges affect digital credentials' purpose for employers' recruitment and lifetime learning, mirroring challenges with portfolio assessment (Miller & Jorre de St Jorre, 2024). The transition from the HEI ecosystem (creator) to a

workplace (consumer) is fraught with ambiguity due to HEI-specific terminology (Ahsan et al., 2023; Anderson & Staub, 2015; Randall & West, 2022) and a lack of description transparency (Rughiniș & Matei, 2013).

Methodology

A single case study research design was chosen to explore the "how" and "why" of digital credentials implementation in HEIs (Yin, 2014). A design-based research (DBR) methodology captured the iterative development cycles of the case study, bridging the gap between intervention and research (Amiel & Reeves, 2008).

DBR focuses on shareable results for practitioners and designers promoting adoption, dissemination, and reusability (Cobb et al., 2003; Fishman et al., 2004; The Design-Based Research Collective, 2003; Veletsianos et al., 2016). This study addresses technology implementation issues, not the technology platform itself, avoiding common DBR pitfalls like iterative reuse and research-to-practice gaps (Fishman et al., 2004; McKenney & Reeves, 2013; Ormel et al., 2012).

Previous research examined digital credentials from utilization perspectives rather than HEI perspectives (Babb & Howard, 2023). Our methodology aims to structure HEI digital credentials implementation (Pappano, 2017) by analyzing methodology iterations developed across the state's public HEIs recently.

This framework is ideal for governance and process-related implementations in HEIs leveraging the participants' qualitative data creation, mitigating many of the DBR identified challenges (Parmaxi & Zaphiris, 2020). This project encompassed a series of emergent working groups and committees, including faculty, staff and administrators.

The Design Phases

We analyzed a collection of qualitative documents from the Institute's digital credentials governance process, defining five design-based cycles for Institute-level implementation, governance, and badge taxonomy for an initial pilot of the College's FlexStack upskilling program.

Iteration 1: Investigation & Technical Planning

The Digital Credential Technology Working Group (TWG) investigated software platforms for digital credentials, guided by the College of Lifetime Learning executive leadership team (CELT). TWG membership included Institute stakeholders involved in digital credentials: early adopters, central information (educational) technology team members, a research software developer, and educational technologists in professional education.

The TWG developed a charter outlining project scope, then investigated platform usage within the Institute and across HEIs. The TWG identified four Institute instances of digital credentials. To gather a larger view of the HEI ecosystem, the TWG investigated software platforms at peer institutions in the Americas and Europe as members of the Digital Credentials Consortium (n=12), which garnered no actionable insight. Subsequently, the TWG selected 41 United States universities and their digital credential platforms, categorized in three selection criteria: academic peers determined by collegiate rankings (n=15), geographic peers (n=15), and universities differentiated by national conference presentations (n=11), and assessed their digital credentials usage by scope, platform, and scale. After gathering HEI ecosystem data, the TWG produced an initial list of eleven platform vendors and selected four for closer scrutiny. The TWG constructed key evaluation criteria for each vendor into 18 core feature areas, such as multi-tenancy support, LMS integrations, data privacy and security, and digital accessibility, which facilitated a systematic assessment of each platform's features and suitability for Institute-level needs.

The final assessment resulted in a singular recommended digital credentials platform, presented to the CELT. This iterative process helped the Institute refine and communicate internal criteria and use-cases and ensured platform selection would meet the needs of potential and current stakeholders documenting features, risks, and technology trends. The TWG disbanded after completing its charter.

Iteration 2: Platform Selection, Initial Setup & Integrations

The CELT affirmed TWG's recommendation, given that the CELT manages the college's academic degree and professional education offerings. Following affirmation, a contract was negotiated with the selected digital credentials platform provider. Vendor-led training was offered to improve the Institute's platform knowledge.

The second iteration focused on the design and development of digital credential integrations into existent business processes. A Digital Badge Committee (DBC) was established to evaluate the current state of digital credentials and any integrations with existing student information systems, documenting workflows, capacity, and process, as well as personnel involved. Using the platform functionality identified during vendor-led training, DBC designed updated workflows for digital credentials issuance and record-keeping, and learning management system (LMS), student information system, and digital credentials platform integration. The DBC was disbanded after a vendor platform was set up and workflows established.

Iteration 3: Taxonomy Development

The third iteration began with the establishment of a Digital Credentials Faculty Committee (DCFC) to design a digital credentials taxonomy, codifying digital credentials' metadata categorizations for institutional-level usage (Anderson & Staub, 2015; Gamrat & Zimmerman, 2015). Taxonomies reflect the shared-meaning of digital credentials' rigor and value (Farmer & West, 2016), as the OpenBadges metadata specifications have historically lacked similarly-scoped structured data schemas.

The DCFC designed a credential taxonomy suitable for the college's FlexStack program, while also being cognizant of a taxonomy scalable and flexible for future use-cases Institute-wide. The DCFC first held meetings with the Institute's existing digital credentials users, which included department, units, and centers throughout campus, to document the variety of emergent use-cases, design considerations, and organically developed taxonomies.

The DCFC then researched taxonomy ecosystems at HEI peers (Kennesaw State University and the University of Central Florida) and professional organizations (UPCEA and 1EdTech). The DCFC began developing Georgia Tech derivations based on these ecosystems (Braxton, 2023; Lokey-Vega, 2022). Building on faculty feedback from the DCFC, the committee presented a final iteration of the digital credential taxonomy which was approved by CELT.

Iteration 4: Visual Design

During taxonomic ecosystem research, the DCFC encountered multiple instances of HEI visual design representations of taxonomic categories (Gibson et al., 2015; Randall & West, 2022). The fourth iteration centered around the DCFC's delegated visual design development to a Visual Design Committee (VDC) including marketing and instructional design offices.

The VDC conducted a series of design sprints to quickly prototype visual design considerations. First, the VDC applied institutional brand identity guidelines for best practices on logo, colors, shapes, and patterns. In concert with the central communications office feedback, the VDC presented the visual designs to CELT to solicit feedback.

The VDC appended the initial designs to include external learner use-cases and partner co-branded digital credentials. The VDC presented the visual designs to the DCFC for feedback, which mainly centered around text accessibility with visual design sizing. The VDC conducted an additional sprint to refine the visual design templates for more legible text sizing. Additionally, the VDC developed a stacked credential visual design, visually describing the stacked nature of multiple digital credentials showcasing competency growth (Mangan, 2015). With the final visual design deliverables, the VDC presented its badge templates to the CELT and disbanded. However, marketing will continue involvement to edit visual designs as needed in the future.

Iteration 5: Implementation & Issuance Processes

The fifth iteration focused on cohesive workflow, managed by DCFC. The DCFC identified a need for an implementation team of faculty and administrators – the Digital Credential Review Committee (DCRC) – tasked with managing the digital credentials request workflow, intake into the vendor platform, and issuance process standardization.

The DCRC developed an intake form for digital credential requests, examined syllabi, and assigned the appropriate taxonomy level, reaching consensus with the instructor. After approval, the DCRC would delegate the implementation work to the College's Learning Systems team (LST). The LST applied the visual badge design, assigned metadata from the request into the digital credential platform template, and published the digital credential for issuance to learners. Learners were able to claim the digital credential through the LMS or through an email notification.

The output of this iteration was the development of a governance and issuance process for digital credentials, proceduralizing the taxonomy, visual design, intake form, and technology platform to deliver a first cohort of Institute-managed digital credentials. The DCRC plans to continue its work and hire a micro-credential coordinator to facilitate communications between faculty requests, committee review processes, and LST pushing out badges via the credentialling system.

Discussion & Recommendations

We position the DBR case study both as a push- and pull-typology implementation (Henriksen & Ejsing-Duun, 2022). We present the case study as a push-typology in diffusing the work of Kennesaw State University to other HEIs. We encourage HEIs to use this case study as a pull-typography allowing similar HEIs to adapt the iterative process within their organizations.

Additionally, we position the DBR case study in the production of design principles, following the Design-Based Research Collective's (2003) purpose as proto-theories to construct cumulative design knowledge: digital credentials taxonomy and governance guidance. We follow Feulner et al. (2024)'s guidance in listing design principles, as snapshots of practical design and gained knowledge, as orientation and direction for HEI implementation of digital credentials and list our design principles following the work of Ma and Harmon (2009).

Principle 1

A HEI should develop a digital credentials taxonomy as a flexible, scalable living-rubric. Both the literature and our case study position the developed taxonomy and its rubric as the current HEI state viewed through our local Institute ecosystem. We envision this intersection as a wider ecosystem of shared language with permutations established for the institute-specific competencies, foci, or differentiation areas. Much like how degrees and diplomas carry sociocultural contexts of the institution at the time of graduation, so should digital credentials and their meta-data relationships with taxonomy. Digital credential issuers should expect medium-to-long term shifts in the digital credential ecosystem due to technological innovations, wider adoption of non-academic digital credentials, recommendations or requirements by accrediting bodies.

Principle 2

A HEI should structure digital credentials governance as a critical assessment process of instructional rigor and quality, adherence to learning objectives, and mapping to taxonomy schema. We define governance as a relationship between instructors and administration to appropriately define instructional evidence within the digital credential meta-data – a translation between the course and its associated artifacts. This two-way negotiation serves as a reinforcement of pedagogical instructional design principles embedded within the course and builds consistency and equity across digital credentials in a HEI.

Summary

As digital credentials gain popularity, we position this DBR methodology for pull-typology use within similar HEI ecosystems for governance and process considerations. While our work is a product of successive iterative cycles, we realize that future technological disruptions – digital wallets, or summative long-form digital credential packages such as a Comprehensive Learner Record (CLR) or Learner Employment Records (LER) - may provide future challenges worth consideration. We expect that we will enact new iterations with our DBR methodology to analyze the technical planning, governance, and issuance processes needed to support such ventures.

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Developing Employability Skills: A Case Study of Synchronous and Asynchronous Modalities

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Abstract

In today's workforce, soft skills such as communication and adaptability are increasingly critical for career success, yet many graduates lack these competencies. As online learning continues to expand, questions arise about its effectiveness in cultivating essential workplace skills. This mixed-methods case study examines how synchronous and asynchronous distance learning modalities support the development of soft skills, focusing on communication and adaptability. Drawing on data from two online courses, an asynchronous professional development course (n = 24 pre, n = 19 post) and a synchronous construction leadership course (n = 2), the study utilizes surveys, reflections, and assignments to assess student growth. Quantitative data analysis reveals moderate initial confidence in soft skills, with room for growth, particularly in self-reflection and time management. Thematic analysis of qualitative data highlights the importance of structured reflection, real-world application, and feedback. Findings underscore the need for intentional instructional strategies, including guided self-assessment and practical communication activities, to bridge the gap between virtual learning and workforce readiness. Implications for faculty, instructional designers, and institutions are discussed, along with recommendations for future research.

Introduction

College graduates trying to enter the workforce are being rejected before starting their first professional jobs. A recent survey of hiring managers reported nearly 30% of executives do not want to hire Gen Z workers, citing a lack of soft skills that include communication, professionalism, and adaptability (Elting, 2024). In an era where technical expertise is abundant, it is not coding, finance, or engineering skills that are keeping graduates from securing jobs, it is their inability to collaborate, think critically, and communicate effectively. Employers are sounding the alarm: soft skills are no longer optional; they are the determining factor in career survival. As online learning becomes more prevalent, the question arises: can virtual education effectively develop the soft skills necessary for workforce success? This study explores how synchronous and asynchronous distance learning influence the development of communication and adaptability, two of the most critical yet overlooked skills in higher education. By analyzing student interactions and reflections, this research aims to uncover the best instructional strategies to bridge the gap between online education and real-world workforce expectations.

Literature Review

Soft skills have become a critical determinant of employability and career success in today's workforce, with industry leaders emphasizing the need for communication, adaptability, collaboration, and technical expertise (Jacks, 2024; Rosamilha & da Silva, 2025). Industry human resource directors consistently report that while college graduates possess strong technical skills, they often lack the essential soft skills (such as communication, teamwork, and adaptability) needed to maintain long-term employment and career advancement (Anair, 2024; Carvalho & Vilaça, 2024; Chigbu & Umejesi, 2024).

Distance education has progressed significantly, with foundational scholars shaping the theoretical and practical frameworks that guide modern online learning (Tait, 2018). Wedemeyer (1971) is widely regarded as the father of modern distance education, advocating for independent study models that emphasize learner autonomy and flexibility. Moore (1973) expanded on this idea with his Transactional Distance Theory, which conceptualizes the role of dialogue, structure, and learner autonomy in distance education. Further theoretical advancements were made by Peters (1971), who likened distance education to an industrialized system, focusing on scalability and

efficiency. Holmberg (2020) introduced the concept of Guided Didactic Conversation, highlighting the importance of engagement and interaction in enhancing student motivation in remote learning environments.

As distance education continued to advance, researchers sought to understand the social and cognitive dynamics of online learning. Garrison, Anderson, and Archer (2000) developed the Community of Inquiry (CoI) Framework, which underscores three critical components for effective online learning: cognitive presence (critical thinking), social presence (interaction and engagement), and teaching presence (instructional guidance). These foundational studies continue to inform best practices in both synchronous and asynchronous learning, shaping the landscape of distance education (Rosamilha & da Silva, 2025; Means et al., 2014)). While these frameworks have supported the development of cognitive, meta-cognitive, and social competencies, the assessment of soft skills in online settings is relatively unexplored. While some studies have sought to measure soft skills, common definitions and the online environment can create unique challenges. There remains a critical distinction between the development of soft skills and the measurement of soft skills with a valid and reliable instrument in an online setting.

Research Questions

As soft skills become essential for workforce success, educators must consider how different online learning environments shape their development. This study explored the following research questions:

Research Question 1: How do synchronous and asynchronous distance learning modalities influence the development of soft skills such as communication and adaptability?

Research Question 2: What instructional strategies support the development of soft skill in virtual learning environments?

Methodology

This study a case study design (Yin, 2018) to explore the lived experiences of participants across distinct settings. A convergent mixed-methods approach (Creswell & Plano Clark, 2018) was used to examine how different online learning modalities (synchronous and asynchronous) support the development of soft skills, particularly communication and adaptability. Data collection included both quantitative self-report surveys and qualitative artifacts, such as weekly reflections and course assignments, to assess students' perceived growth over time. The study involved two distinct online courses: an asynchronous professional development course (n = 24) and a synchronous construction leadership course (n = 2). While the asynchronous course generated a sufficiently large sample for descriptive and inferential statistical analysis, the synchronous course was treated as a pilot using narrative analysis, aimed at exploring the experiences of individual learners to inform future research with a larger sample. Data from the synchronous course were analyzed as **i**ndividual narrative case vignettes, focused on students' reflections regarding soft skill application, identity development, and leadership growth within real-world contexts. The use of narrative analysis in the synchronous pilot course enabled the researchers to deeply examine individual student experiences through reflective storytelling. This approach captured how learners made sense of professional identity, skill growth, and learning challenges over time. Together, these frameworks provide a robust foundation for analyzing how modality, instructional design, and learner reflection intersect to influence soft skill development in virtual higher education.

The theoretical foundation of this study integrates three complementary perspectives. First, the Community of Inquiry (CoI) framework (Garrison, Anderson, & Archer, 2000) provides a lens for understanding how online educational experiences are shaped by the interplay of cognitive presence (meaning-making), social presence (authentic engagement), and teaching presence (instructional design and facilitation). This model guided the interpretation of both learning environments, especially in relation to learner interaction and perceived professional growth. The study draws from constructivist (Vygotsky & Cole, 1978) and experiential learning theory (Kolb, 2014) which view learning as an active, situated process shaped by reflection, application, and the learner's agency. These theories informed the use of structured journaling, diagnostic self-assessments, and applied learning tasks to foster metacognitive development and soft skill acquisition.

Setting and Data Collection

In the asynchronous course, students completed a pretest and posttest to assess their self-perceived communication and adaptability skills. Additionally, they submitted weekly journal reflections, where they documented experiences

applying soft skills in academic, professional, or personal settings. These reflections provided qualitative data to track how students perceived their own growth over time and identify skill development patterns. In the synchronous course, students completed a pretest and posttest measuring their self-perceived soft skills. Unlike the asynchronous course, these students engaged in weekly assignments centered on construction leadership theories. Each assignment required students to analyze how leadership theories could be applied in real-world scenarios, offering insight into their understanding and application of soft skills in professional contexts.

Data Analysis

Quantitative analysis was conducted for the asynchronous course (n = 24) using descriptive statistics to examine students' self-perceived soft skills in both pretest and posttest. Due to sample size constraints and non-normal distributions, non-parametric methods were prioritized where applicable. Descriptive statistics (means, medians, standard deviations, and modes) were calculated to identify baseline competencies and measure changes over time. A paired t-test was not used, as the primary intent was to establish developmental trends rather than to test hypotheses for generalization. In the synchronous course (n = 2), the sample size precluded formal statistical testing. Instead, data were analyzed through individual case summaries and thematic coding of student reflections to explore perceived growth in communication, adaptability, time management, and professional identity. This exploratory study aims to illuminate how students experience the development of soft skills, particularly communication and adaptability, within asynchronous and synchronous online learning environments. Rather than seeking generalizability, the study focuses on surfacing detailed insights from student self-assessments and reflections. Qualitative data were drawn from weekly journal entries in the asynchronous course and structured assignments in the synchronous course. Thematic analysis was used to identify recurring patterns in students' descriptions of their strengths, growth areas, and evolving leadership competencies.

Several limitations should be acknowledged. The extremely small sample size in the synchronous course limits interpretability and transferability of findings from that context. Additionally, reliance on self-reported data introduces the possibility of response bias, as students may over- or underestimate their abilities. Structural differences between the two courses—such as the use of DiSC assessments and leadership theory activities in the asynchronous course—may have also influenced students' engagement and responses, potentially shaping their developmental trajectories differently across modalities.

Results

The results of the pretest survey provide insight into students' self-perceptions of their soft skills before participating in the course. Due to the difference in sample sizes between the two courses, quantitative analysis was conducted for the asynchronous course (n = 24). At the same time, descriptive summaries and qualitative insights were used for the synchronous course (n = 2). Table 1 presents a frequency distribution of Likert scale responses for the asynchronous course. These results indicate varying levels of confidence in communication and adaptability, with most students rating their skills as moderate to high but few selecting the highest level of agreement. Due to the small sample size for the synchronous course, pretest responses were analyzed on an individual basis. Instead of a frequency table, a narrative summary of each student's responses and qualitative reflections offer deeper insights into their skill development perceptions.

Asynchronous Pretest Results

The pretest survey for the asynchronous professional development course (n = 24) provided insights into students' self-perceptions of key soft skills, including communication, adaptability, time management, and professional growth. The findings indicate varying levels of self-assessed competencies, with notable gaps in self-reflection, independent skill development, and confidence in professional communication. While most students rated their skills as moderate to high (Likert scale ratings of 3 or 4), fewer respondents selected 5 (Strongly Agree) across most categories, suggesting room for growth and skill enhancement. Additionally, no students rated themselves at the lowest confidence levels (1 or 2) in adaptability and communication, implying a baseline level of perceived competency in these areas. Table 1 presents the distribution of responses across key survey items.

Table 1

Distribution of Responses in Pretest Survey (Likert Scale 1-5)

Survey Item	f(1)	f(2)	f(3)	f(4)	f(5)	N

Self-reflection on personal/professional growth	1	1	6	13	3	24
Confidence in time management (self-paced learning)	0	2	7	10	5	24
Identifying and addressing skill gaps	0	2	8	11	3	24
Communicating effectively in a professional setting	0	0	5	15	4	24
Adapting to new responsibilities and challenges	0	0	7	15	2	24

Note. *f* indicates the frequency of responses in each category. *N* represents the total number of respondents ($N = 24$).

As shown in Table 1, the pretest survey results highlight students' self-perceived strengths and areas for improvement in key soft skills. The data indicate moderate confidence levels across most skills, with a tendency for students to rate themselves at level 4 (Agree) rather than level 5 (Strongly Agree). This suggests that while students believe they possess foundational competencies, they may lack the confidence or experience to assess their skills at the highest level. Additionally, few students rated themselves at the lowest levels (1 or 2), indicating that most participants believe they have at least a baseline proficiency in these areas. In the next section, an additional analysis focused on means, standard deviation, and the most commonly selected responses for each soft skill category. To better understand these self-perceptions, Table 2 presents the mean, standard deviation, and most commonly selected responses for each soft skill category. These descriptive statistics help quantify the variability in student confidence levels across different skill areas.

Table 2

Asynchronous Pre-Test Survey Results – Self-Perceived Soft Skill Competencies in Virtual Learning

Survey Item	**M**	**SD**	**Mode**
Self-reflection on personal/professional growth	3.67	0.91	4
Confidence in time management (self-paced learning)	3.83	0.82	4
Identifying and addressing skill gaps	3.79	0.85	4
Communicating effectively in a professional setting	3.92	0.76	4
Adapting to new responsibilities and challenges	3.79	0.84	4

Note. This table presents pre-test survey responses on students' self-perceived soft skills, rated on a Likert scale from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). Frequencies (*f*) indicate the number of students selecting each response option. These results establish a baseline for comparison with post-test data to assess skill development over time ($N = 24$).

Table 2 presents the mean scores, standard deviations, and most frequently selected responses for each key soft skill category in the asynchronous professional development course ($N = 24$). The results provide a more quantitative perspective on students' self-assessments, revealing moderate to high confidence levels across all measured competencies. The mean scores for all five skill areas range between 3.67 and 3.92, indicating that most students rated their abilities as either "Agree" (4) or "Moderate" (3) on the Likert scale. Communicating effectively in a professional setting had the highest mean ($M = 3.92$, $SD = 0.76$), suggesting that students generally feel more confident in their ability to communicate professionally compared to other soft skills. However, even in this category, the standard deviation suggests some variation in responses, indicating differing levels of perceived competency among students.

Time management ($M = 3.83$, $SD = 0.82$) and identifying and addressing skill gaps ($M = 3.79$, $SD = 0.85$) also received relatively high ratings, suggesting that students feel somewhat confident in managing their learning and recognizing their professional development needs. However, the standard deviation values indicate that some students may still struggle in these areas, warranting targeted support and structured interventions. Interestingly, self-reflection on personal/professional growth received the lowest mean score ($M = 3.67$, $SD = 0.91$), which aligns with prior research suggesting that students may not engage in reflective practices consistently without structured guidance. While most students rated themselves at level 4 ("Agree"), the higher standard deviation (0.91) compared to other categories suggests greater variability in confidence levels regarding self-reflection. This highlights the need for explicit reflection prompts and feedback mechanisms to support students in evaluating their own growth effectively. Overall, the pretest survey results establish a baseline for comparison with post-test data, allowing for an

assessment of skill development over the course duration. The findings suggest that while students enter the course with reasonable confidence in their soft skills, there is room for improvement, particularly in self-reflection and skill assessment. Future instructional strategies could focus on enhancing these areas through structured self-assessment activities, mentorship, and feedback mechanisms to help students gain a more accurate perception of their professional competencies.

Self-Reflection and Professional Growth

The results show a wide range of responses in self-reflection on personal and professional growth. While the majority of students (54%) selected 4 (Agree), only 13% strongly agreed (5) that they regularly engage in reflective practices. The presence of lower ratings (1 or 2) among a small subset of respondents suggests that some students struggle with structured self-assessment, a critical skill for lifelong professional development.

Confidence in Time Management

When asked about their ability to manage time effectively in a self-paced learning environment, only 21% of students strongly agreed (5), while 42% selected 4. Meanwhile, 8% of students rated themselves at 2, indicating a lack of confidence in their ability to regulate their learning schedules independently. This suggests that although many students feel somewhat capable of time management, some may benefit from structured guidance, productivity strategies, or time management training.

Identifying and Addressing Skill Gaps

The ability to recognize and address areas for improvement is a key factor in professional development. While 46% of respondents selected 4 (Agree), only 13% expressed strong confidence (5) in their ability to assess and improve their skills independently. Meanwhile, 33% of students rated themselves as neutral (3) and 8% rated themselves at 2 (Disagree), suggesting a lack of structured self-evaluation practices or difficulty identifying skill deficiencies without external feedback.

Communication in Professional Settings

Communication skills are a critical component of employability and workplace success. The majority of students (63%) rated themselves at 4 (Agree), while 17% strongly agreed (5) that they communicate effectively in professional contexts. However, 21% remained neutral (3), suggesting that some students may feel uncertain about their ability to engage in effective workplace communication. Notably, no students rated themselves at 1 or 2, indicating a general sense of competency in this area, albeit with room for refinement.

Adaptability to New Responsibilities and Challenges

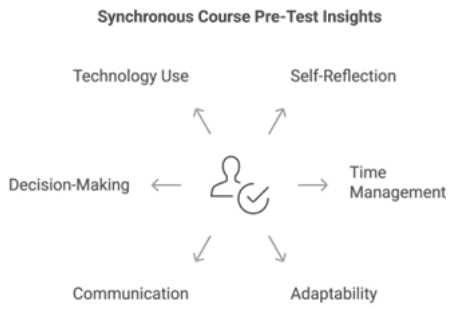
Adaptability is crucial in a rapidly evolving workforce. In this category, 63% of respondents rated themselves at 4 (Agree), while only 8% expressed strong confidence (5) in their ability to handle unexpected challenges. A notable 29% of students rated themselves at 3 (Neutral), which may indicate uncertainty in their ability to manage unpredictable professional situations. Again, no students rated themselves at 1 or 2, suggesting that while adaptability is not perceived as a significant weakness, students may benefit from activities that promote resilience and flexible thinking. These results establish a baseline understanding of students' soft skill development and will serve as a reference point for evaluating the impact of instructional strategies throughout the course. The posttest survey results will provide insight into whether engagement in the asynchronous course improves students' self-perceptions of these critical workplace skills.

Synchronous Course Pre-Test Results

Due to the smaller sample size in the synchronous construction leadership course (n = 2), responses were analyzed through individual case summaries. The two students, referred to as "Alex" and "Jordan" (pseudonyms), provided insights into their perceived strengths, challenges, and areas for growth. Their reflections highlight key themes in self-assessment, time management, adaptability, communication, decision-making, and technology use as depicted in Figure 1 below.

Figure 1

Synchronous Course Pre-Test Insights



Self-Reflection & Time Management

Both Alex and Jordan demonstrated a strong inclination toward self-reflection. Alex stated, "I regularly reflect on my personal and professional growth," while Jordan emphasized that structured reflection has helped them refocus on long-term career goals. This suggests that both students recognize the value of continuous self-improvement and professional awareness. However, time management emerged as a challenge, particularly for Jordan, who noted, "With a heavy workload both in school and my current job, it is sometimes a challenge to work on professional development while completing the necessary tasks for these responsibilities." This statement reflects the difficulties students face in balancing academic and professional responsibilities, an issue that could impact their ability to fully engage with course content.

Adaptability & Communication

Adaptability was another key area of discussion, with Alex sharing a compelling example of managing college while transitioning into a full-time construction job. "When I started college, I was not working. About a year after I started, I attained a full-time position in construction and continued college while managing both at the same time." This highlights the importance of resilience and the ability to navigate multiple commitments successfully. While both students displayed adaptability in professional settings, their responses indicated potential areas where additional support and strategies could enhance their ability to manage new challenges. Communication and confidence also emerged as areas for improvement. Jordan expressed a desire to strengthen professional communication skills, stating, "I hope to improve my communication skills in a professional setting as well as become more confident sharing ideas and making decisions." This aligns with industry demands for strong interpersonal and leadership skills, suggesting a need for targeted activities that build confidence in workplace communication.

Decision-Making & Technology Use

In terms of scenario-based decision-making, the students demonstrated different approaches to ambiguity. When asked how they would handle an assigned project with minimal instructions, Alex preferred to seek clarification from a supervisor, while Jordan opted to start working based on their understanding and seek feedback later. This contrast suggests varying levels of comfort in decision-making, highlighting an opportunity to incorporate exercises that reinforce problem-solving and workplace autonomy. Both students confirmed that they have access to the necessary learning resources, but their use of technology differed. Jordan noted, "I complete my homework using multiple tools, including a laptop and mobile device, depending on availability." This indicates a flexible approach to learning but also underscores the need to ensure that all students have access to digital tools that facilitate effective participation in the course.

Overall, the pre-test responses from the synchronous course students provide valuable insights into their strengths and areas for growth. Their reflections reinforce the importance of self-reflection, adaptability, and communication in professional development while highlighting the challenges associated with time management and decision-making. These findings will serve as a foundation for assessing skill progression throughout the course.

Asynchronous Posttest Results

At the onset of the course, student self-assessments revealed a moderate level of confidence across key soft skills. As shown in Figure 1, pre-test feedback emphasized six core competencies: communication, adaptability, time management, self-reflection, decision-making, and technology use. Pre-course measures suggested that learners felt fairly competent in both communication ($M = 3.92$, $SD = 0.76$) and adaptability ($M = 3.79$, $SD = 0.84$). But, responses indicated wider variation in areas such as time management and self-reflection, domains closely tied to autonomous learning and self-regulation. These initial findings pointed to a need for more deliberate instructional supports directed at fostering metacognitive awareness, particularly in online CTE settings. By the conclusion of the course, students reported notable gains in all measured competencies. Post-assessment responses reflected increased self-confidence, particularly in communication, adaptability, and time management, where many participants chose the highest possible score (5 = Strongly Agree) on the Likert scale. Table 3 outlines the descriptive statistics for post-test outcomes:

Table 3

Asynchronous Descriptive Statistics for Post-Test Measures of Soft Skill Development ($n = 19$)

Soft Skill Area	Mean	Median	Std. Dev.	Min	Max
Communication	4.47	5.0	0.61	3.0	5.0
Adaptability	4.42	5.0	0.69	3.0	5.0
Time Management	4.47	5.0	0.77	3.0	5.0
Skill Improvement	4.32	4.0	0.58	3.0	5.0
Task Prioritization	4.42	5.0	0.77	3.0	5.0
Self-Reflection	3.63	4.0	0.60	2.0	4.0

***Note*.** Data reflects student self-assessments on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). The original participant pool included 24 students; however, the final post-test sample size was reduced to 19 due to course withdrawals.

The post-course profile indicates that students left the course feeling well-prepared in several transferable skill areas. High mean scores in communication, adaptability, and time management reflect strong learner confidence. While self-reflection earned the lowest average score ($M = 3.63$), its modest growth nonetheless suggests partial improvement and identifies an area for future instructional attention. Despite some standard deviation indicating individual variability, particularly in time management. Many participants rated themselves at the upper end of the scale, implying perceived growth and practical application of course concepts.

Qualitative responses reinforced the quantitative findings, offering deeper insight into students' perceived growth and engagement with course content. Several students highlighted the development of leadership identity and self-awareness. One participant reflected, *"I have gained a lot of insight to my preferred leadership styles… I intend to expand on this knowledge and further improve my leadership skills to be a more effective leader at work."* This response illustrates the course's impact on leadership development and the transferability of learned skills to professional contexts. Another student emphasized the usefulness of the DiSC assessment as a tool for increasing self-understanding, noting, *"Learning more about my approach, motivators, and what is stressful to me has helped me become more aware of my habits... and how to use them best and/or change them to improve my skills."* Such reflections suggest that diagnostic tools enhanced students' ability to assess their own behavioral tendencies and adapt their professional strategies accordingly. Even when students described difficulty with the reflective process, they acknowledged its value. One respondent stated, *"It was somewhat challenging to reflect on some of the concepts and assessment feedback… but overall both were helpful and insightful to understanding myself and how I approach certain scenarios."* This comment highlights the developmental role of structured reflection, even when it demands significant cognitive and emotional effort. Overall, the qualitative data support the conclusion that structured reflection activities, personality assessments, and feedback mechanisms contributed to learners' metacognitive development. These strategies appear particularly effective in fostering self-awareness, adaptability, and leadership efficacy in online career and technical education (CTE) contexts.

Discussion

The results reveal notable differences in soft skill development between the asynchronous (n = 24 pre, n = 19 post) and synchronous course (n =2) formats. Researchers plan to continue data collection to increase the sample size in both modalities, but specifically in the synchronous classes. Data will be re-analyzed after two more semesters to strengthen results. In the asynchronous course, students demonstrated measurable growth in communication, adaptability, and time management, with post-test mean scores exceeding 4.4 on a 5-point scale. Although self-reflection remained the lowest-rated area (M = 3.63), qualitative data indicated that structured reflection activities, such as journal prompts and the DiSC personality assessment, supported students' metacognitive development and leadership identity. These tools provided students with a framework to evaluate their personal growth and professional strategies, reinforcing the value of guided self-assessment in virtual learning environments. In contrast, the synchronous course, which included only two participants, yielded rich qualitative insights but lacked the structured instructional supports evident in the asynchronous course. Students in the synchronous setting expressed a strong inclination toward self-reflection and adaptability, particularly in balancing academic and professional responsibilities. However, both students identified challenges with time management and professional communication. Their reflections suggested that while synchronous interaction promoted self-awareness, the absence of formal tools for structured reflection may have limited the depth of their development in certain areas. Overall, the asynchronous course appeared more effective in integrating soft skill development through reflection, primarily due to the intentional use of assessment tools and reflective frameworks. The synchronous course facilitated meaningful engagement but would benefit from the inclusion of structured reflection strategies to more consistently support students' growth in communication, adaptability, and self-awareness. These findings highlight the importance of purposeful instructional design in virtual environments to foster transferable soft skills.

Findings from this study align with extant research on soft skill development, reinforcing the need for structured support to increase students' confidence (Cimatti, 2016; Cinque, 2016; Goleman, 2005). Prior research reports that while students recognize the value of self-reflection, they may not engage in it regularly without structured prompts (Johns, 1995; Kolb, 2014). Students' confidence in their time management skills may reflect a broader tendency to overestimate their abilities (Voon et al., 2024), underscoring the importance of structured support systems that promote self-regulated learning and effective time management strategies. Findings support research indicating that students struggle with accurately assessing skill gaps (Kruger & Dunning, 1999), reinforcing the importance of structured feedback and mentorship. Results on professional communication align with literature suggesting that while students perceive themselves as competent, applied workplace scenarios can further strengthen their abilities. Findings on adaptability support existing research on the importance in workplace settings, though students may need exposure to real-world challenges to build confidence in applying new knowledge in the workplace. Unlike some studies that suggest students naturally develop competencies over time, this study indicates that targeted interventions are necessary to improve self-efficacy and workplace readiness.

Implications for Practice

The findings from this study highlight several key implications for educators, instructional designers, and institution administrators seeking to enhance students' soft skills in a self-paced learning environment.

Implications for Faculty and Instructional Designers

Given the varied responses in self-reflection on personal and professional growth, incorporating structured self-assessment tools, reflective journaling, or guided discussions could help students develop deeper awareness of their strengths and areas for improvement. Embedding exercises that help students identify and address their own professional development needs (such as formative assessments, peer feedback opportunities, and targeted skill-building activities) could encourage a more proactive approach to self-directed learning. While students generally expressed confidence in professional communication, some remained neutral in their self-assessments, suggesting that practical exercises such as role-playing, simulated workplace interactions, and industry-specific communication training could increase readiness for real-world professional settings. Similarly, promoting self-directed learning through experiential learning, problem-based learning, case studies may help students develop flexible thinking to navigate unexpected workplace challenges beyond what can be learned in a textbook alone.

Implications for Institutions

Since confidence in time management was not universally strong, institutions could provide targeted training on self-regulation strategies, time management techniques, and productivity tools tailored to self-paced learning. To bridge the gap between students' self-perceptions and workplace expectations, institutions should consider collaborating with industry professionals to provide real-world insights, mentorship, and feedback on skill

application. Perhaps providing stipends for industry professionals to be guest speakers, assigned mentors in a mentorship program, or serving as a panelist to give feedback on student presentations or skill demonstrations.

Recommendations for Future Research

Given the small sample size for this study, it would be a good idea to continue data collection. Building on this same study with a larger sample size would strengthen the generalizability of these findings and provide a more comprehensive understanding of students' soft skill development across diverse populations. Future research should explore the impact of different learning modalities on soft skill development, comparing asynchronous, synchronous, and hybrid learning environments to determine which format most effectively enhances students' self-confidence and competency. Additionally, implementing targeted interventions—such as structured mentorship programs, guided self-reflection activities, or interactive time management training, could provide deeper insights into which strategies lead to the most significant improvements in students' soft skills. Beyond self-reported confidence, future studies should also incorporate employer or supervisor assessments to validate whether students' perceived competencies align with their actual workplace performance. Furthermore, examining post-graduation career outcomes could help determine how soft-skill development during coursework translates into career readiness, job market success, and long-term professional growth.

It is also worth noting that future research could benefit from a clearer, shared definition of "soft skills" across industry and academic sectors. Establishing common terminology and frameworks would support the development of more valid and reliable instruments for assessing soft skill growth. Finally, building on Ryan Craig's (2023) call for a national expansion of "earn and learn" programs, future studies should examine how online learning, particularly asynchronous modalities can integrate apprenticeship-style models that offer real-world skill application. Craig argues that apprenticeships should no longer be confined to trades, but should expand into technology, healthcare, business, and other fields where hands-on learning is essential. Embedding such experiences into virtual programs could provide students with more direct pathways to employment while reinforcing the development of communication, adaptability, and other critical workplace skills.

Conclusion

In conclusion, the pretest survey results provide a comprehensive baseline of students' self-perceived competencies in key soft skills, highlighting areas of strength as well as opportunities for development. While most students express moderate confidence in their abilities, the data suggest that many have yet to reach a level of strong self-assurance, particularly in self-reflection, time management, and identifying skill gaps. The findings indicate that while students generally perceive themselves as proficient in communication and adaptability, there remains room for growth in fully internalizing and applying these skills with confidence. These insights will guide instructional strategies aimed at enhancing students' self-efficacy and practical application of soft skills throughout the course. The forthcoming posttest survey will provide a comparative analysis to assess the effectiveness of these interventions and measure students' progress in developing essential workplace competencies.

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Artificial Intelligence's Role in Student Plagiarism: A Graduate University's Model of Best Practices

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Abstract

This white paper discusses a model of best practices to better identify and address plagiarism issues with students using AI. It serves as an example to help younger institutions that may not have a policy in place to recognize the importance of hitting this head-on. By creating a taskforce, we were able to quickly come to a resolution for a university that has three campuses in Chicago, Online, and in Vancouver, BC. We also share best practices that will help current professors and core faculty alike in dealing with plagiarism from students using AI in their work. We end with a discussion of examples that support this effort.

Keywords: AI, plagiarism, model of best practices, Turnitin, Grammarly, training.

Introduction

For most universities, plagiarism is nothing new. It has been an issue for students since the first paper was submitted. Universities have academic honesty policies in place to help combat the use of plagiarism; however, it is a battle that will likely never end. In fact, the more advanced the world's technology gets, the easier it will be for students to plagiarize. Luckily, as the technology grows, so do the tools used to recognize plagiarism. This paper will outline an academic institution's journey in recognizing and training students on academic integrity at the height of Artificial Intelligence (AI) being used by students.

Background

Turnitin is not a new tool, and universities have been using this tool for years. While it is not the only tool used to detect plagiarism on campuses, Turnitin is the more popular choice (Alkhaqani, 2023). The tool has many benefits for professors and students alike. It is designed to capture the integrity of the student, but it also provides them with a space to learn and become better writers (Gutierrez-Aguilar et al., 2023; Siswanto et al., 2024). However, it is suggested that universities need to do better jobs with training initiatives for students when using Turnitin (Nketsiah,

Imoro, & Barfi, 2023). Some institutions also reported that most students do not even know what the tool is, how it is used, nor are they aware of the academic honesty policy of their respective campus (Alua, Asiedu, & Bumbie-Chi, 2023; Ismail, & Jabri, 2023).

Institutional instructors use Turnitin for a variety of reasons. For some, it has become more than just an integrity tool; it has also led to better feedback for students regarding other high-level issues in the student paper (Laflen, 2023). These features include GradeMark and PeerMark (Li, 2018; Li, 2017). It has been reported that using these features increases critical thinking abilities in students (Alharbi, & Al-Hoorie, 2020). Instructors could also see how students used their comments and made the suggested changes to their papers. While this feature is convenient for instructors, it is not the most user-friendly for students to navigate (Laflen, 2023).

It is important to note that while blatant plagiarizing should not be tolerated in higher education, it is not always intentional (Koca, Pekdağ, & Gezgin, 2023). It could be due to "poor research and citation skills" (Meo & Talha, 2019, p.48).

"Mukasa et al. (2023) report that "lack of interest" could be the cause along with "lack of preparation and effort, low self-efficacy, poor studying techniques, and convenience of internet sources"; pressure of time with competing priorities," such as "misplaced priorities, procrastination, high workloads, poor planning, competing interests, and the perception of availability of time at the start of the semester"; and "lack of understanding of the policy on academic honesty," such as "lack of awareness of plagiarism, lack of awareness of acceptable similarity, conflicting messages from tutors and confusion with high school learning" (p.1) are the reasons" (Koca, Pekdağ, & Gezgin, 2023, p. 250).

Institutions of higher education are now having to fight against AI (Perkins et al., 2024). Now that AI is becoming more prevalent, so are the tools that are used to detect it in student writing; however, there is still much work to do in this area as technology is growing faster than plagiarism tools, such as Turnitin, can update and reevaluate how it is capturing this data (Elkhatat, Elsaid, & Almeer, 2023). There are some reports of students being able to go around this new technology by spending more time with their AI software by adding more key words and outlining the paper for the AI program (Foster, 2023). The good thing is that it takes more effort to do this than to just write the paper itself. Interestingly, universities are not the only ones struggling with this new technology, as academic journals also take great strides in capturing AI content before work reaches the publication phase (Hu, 2023).

Trusting AI Detection Software

Knowing the devastating and extensive consequences of AI in academic writing, some institutions are still weary of using the new AI tool for plagiarism, fearing that it puts students at a disadvantage (Gooch et al., 2024; Walters, 2023). This comes from not knowing exactly how Turnitin is capturing this data with the anxiety that high plagiarism scores using the AI feature could lead to misunderstandings and dismal of students who did not intentionally plagiarize. This is a notable concern due to the fact this technology is new and still in the pilot phase. There are significant differences between GPT-3.5 and GPT-4.0 in terms of how accurately the AI detection works (Walters, 2023). It is reported that AI detection from sources like GPT-3.5 is very accurate; however, using GPT-4.0 the AI detection is less precise (Walters, 2023). Either way, the paid version that most universities use has been shown to be more accurate and precise than their free counterparts (Walters, 2023). Perkins et al., 2023 indicated in their research that AI tools like Turnitin are very reliable in capturing AI-generated content. While the software is not perfect, the errors do not seem to be labeling something incorrectly as AI content; rather, they are not labeling them at all. This indicates that more work needs to be performed on GPT-4.0 and how detection software, such as Turnitin, performs.

Grammarly vs. Turnitin

In recent months, there has been a lot of discussion online about how Grammarly may be detected as AI using Turnitin (Ding & Zou, 2024). This is a problem because many universities pay to use both applications to help

improve students' writing (Ashrafganjoe, Rezai, & Elhambakhsh, 2022). While Grammarly does use AI, it only uses generative AI if the administrator turns that feature on. Grammarly has three options: Grammarly basic-free version, GrammarlyPro-paid version, and GrammarlyGo-A.I. feature (Fitria, 2021; Natale, 2023; Turnitin, 2023). GrammarlyGo is used in both the free and the Pro versions, and yes, if students use this feature, it will show as plagiarized using Turnitin. It is important to note that most institutions turn this feature off (figure 2). However, students can still use the free version on their own.

The Model

Recognizing the dangers of students using AI in their work, Alder University created a model of best practices (Figure 1). Our purpose was not to go after students with more rules and regulations but rather to protect the integrity of the institution and all the stakeholders it harbors. We took great care to ensure our efforts reflected our institution's values and mission. This process was a collaborative effort by faculty from different university campuses from Chicago, Vancouver, and Online; we also had legal counsel involved in the process.

FIGURE 1
MODEL FOR ACADEMIC HONESTY POLICY CHANGE

GPT Taskforce

Our task force was made up of 13 faculty members, including legal counsel from different departments on all three campuses. The Online campus being 100% virtual, the Chicago campus, and the Vancouver campus, which is outside the U.S., shows the global ramifications of this work. We were tasked to look at the current policy and evaluate if any changes needed to be made to serve our community better. Each member of the task force was able to make notes on the current academic honesty policy. After weeks of deliberation, we decided our students would be better served with a strict yet broad scope of AI usage to encounter AI from including but not limited to ChatGPT.

Policy Change

The Academic Honesty Policy Change was finalized by the task force and sent out to all three faculty councils for a vote. Each respective council was able to vote in favor of, approved with changes, or not in favor of. In our case, all three councils on the Chicago, Vancouver, and Online campuses agreed in favor of the changes and the new policy was implemented in the Spring term of 2024 (Appendix). *Examples of those changes are*:

"Copying material and/or using ideas from an article, book, unpublished paper, or any material or source found on the Internet without proper documentation of references and citations, or without properly enclosing quoted material in quotation marks. This includes material retrieved from or generated by artificial intelligence tools, including but not limited to ChatGPT" (Adler University, 2024, paragraph B1)

"Substantial utilization of the published or unpublished work of others without permission, citation, or credit—also known as "cut and paste" or "patch writing"— and including works retrieved from or generated by artificial intelligence tools such as but not limited to ChatGPT; and/or" (Adler University, 2024, paragraph B4).

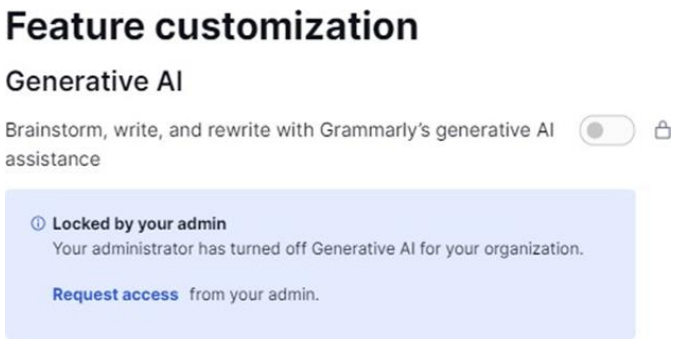
Training Implemented for Faculty

During this process, we realized that several of our faculty members do not grasp the importance of this policy, nor do they use the Turnitin tool provided by the institution effectively. To resolve this issue, we contacted our vendor at Turnitin, who was able to conduct a series of training sessions for our faculty. The vendor was able to show all the current and new features of the tool while paying special attention to AI detection. Seasoned faculty who were aware of how the tool worked and functioned also aided in the training.

Training Implemented for Students

We took special care in training faculty so that they could be training ambassadors for students. Training took place in both synchronized sessions with students as well as 1x1. It was important for faculty to remind students not to use any other program to help them write their papers other than what is approved by the institution. In our case, Grammarly is approved to help their writing as our professional version does not use AI, such as GrammarlyGo. Our admin staff turned this feature off (figure 2). Turnitin will flag it as plagiarized if students use a different version of Grammarly with the feature below turned on.

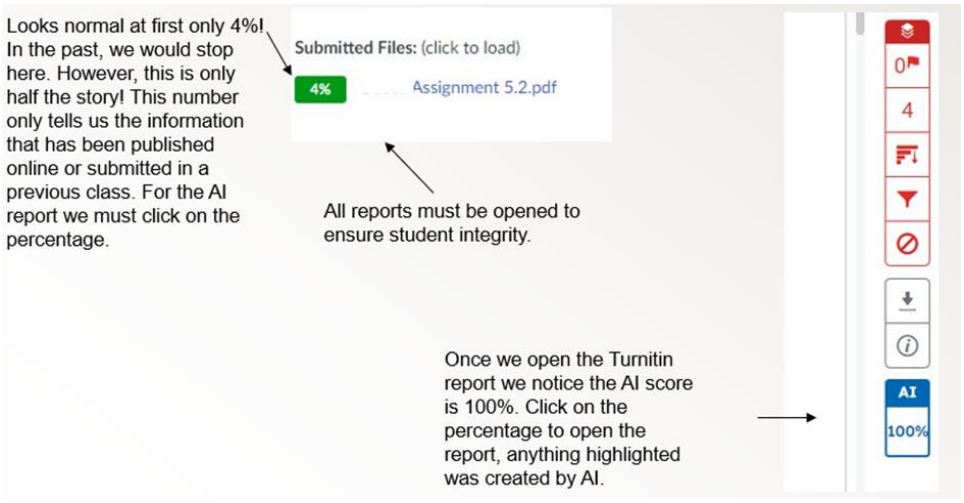
Figure 2. *GrammarlyGo Turned Off by School Admin*



Best Practices

During the training, some of the core faculty determined some best practices for using the Turnitin tool. For some faculty, it was an easy zero on an assignment; however, we asked them to look at it as a training tool for new students. As an institution, we set the boundaries for the main Turnitin score to 20% and the AI score to 30%. Anything over this percentage needs an investigation to determine if the student plagiarized any work. The 20% for the main score is the norm for most academic institutions; however, since AI is so new, we use the 30% threshold to give us some wiggle room for error. Remember these are two different scores; one score does not affect the other (figure 3).

FIGURE 3. *Differences in Scores, Still Plagiarism*



It Is Plagiarism. Now What?

After determining whether the student has committed some sort of plagiarism, it is best to meet them where they are, especially for the first offense. Of course, all faculty members have the academic freedom to grade however they deem appropriate. We hope they will consider other methods before handling out zeros, namely due to the issues expressed earlier in the paper. It is well documented that some students do it unintentionally. Set up a meeting with the students and probe where they got this information. We have heard many students say they have used Grammarly, but we know that if the student used the institutional version of Grammarly, that would not be an issue. So either they are going off on their own using a different version of Grammarly, or there is more to the story. More often than not, they will confess to the program they used. (e.g., A student used a tool other than Turnitin that was supposed to check for plagiarism; while the student thought they were doing the right thing, the tool reworked the paper, added several more citations and references, and rephrased much of their work). That example paper is shown in Figure 3.

As you can see, the main score was strong 4%, with a 100% AI score. Instead of giving the student a zero, the professor allowed the student to redo the work on their own and resubmit through Turnitin. Instead of this becoming a disastrous situation for that student, they walked away with better skills to do the next assignment. As mentioned above, because students can create free accounts and still use the generative AI feature in Grammarly, they should be encouraged to use only their institutional-approved resources, which they must sign into their school accounts to access. If they do not, it is likely to be flagged as plagiarism.

Students should get a copy of the academic honesty policy at the beginning of every course. Have quick conversations about what this means for them, and use this time to talk about AI and the dangers of using it in their work. Have a planned course of action for students who commit plagiarism of any kind. Step 1. Students get a zero. Step 2. Ask the student to set up a meeting with you to discuss. Step 3. Give the student the option to redo the work if it's the first offense. Step 4. Have a plan in place if the student does it again; this step should align with the institution's plan for plagiarism. You will want to have a way to track students through each course. Students often get a clean slate once they get a new professor. If they plagiarize in one course, they are likely to do it in another. Institutions can have a plagiarism committee or send students to a student's comprehensive evaluation committee. For this to work, all plagiarism issues need to be documented and moved with the student. Faculty should know that student (A) has had a plagiarism accusation against

them; however, the student was mentored, and the grade was corrected. Institutions will have to decide how many attempts students should get before being dismissed from the program.

Discussion

Why do we care about AI in students' work? After all, it is the new norm. Unfortunately, many members of the academic community ask this question. One way to look at this is from this example: A member from the community was noted for their exemplary work on their recent publication, and they were set to receive a prestigious award that is given to the top authors in the journal, right before the award was handed out the committee noticed that paper was completely written by AI. Do we still award the recipient? While this example may lead to an easy conclusion, we ask ourselves why we are rewarding students for the same behavior. Does the student get an "A" grade?

Another situation involved a student who chose to write a paper in their own native language, in this case, Mandarin. The student then used AI to translate their work into English. Turnitin caught it and flagged it as AI 100%. The Student Comprehensive Evaluation Committee (SCEC) discussed the situation with faculty on both sides of the argument. Being a social justice-minded institution, some thought the student should be able to write in their own language, and at first glance, it makes sense to come to that conclusion. However, we realized several things. To attend the university, students must prove they can read and speak in English; it is common practice for students outside of English-speaking countries to take the Test of English as Foreign Language (TOEFL) assessment. We also wondered if the student used AI during the admission process. We were looking at the long-term ramifications of allowing students to do this. What happens when these students get hired by an English-speaking company and the company realizes the applicant cannot read or write in English?

Suppose one university does not take plagiarism seriously, whether AI or something else; it affects all institutions of higher learning. We have a responsibility to uphold the integrity of academia. This comes at a time when potential students are doubting the skills and comprehensive education that institutes of higher education offer. The next generation is weighing the cost of attending a university against the future workforce they may find themselves in, which AI will primarily control in the next several years.

We took great care to ensure we represented and reported everything accurately with Turnitin, Grammarly, and other tools in this white paper. It's important to note that technology is changing every day. What might be the reality now may not be tomorrow. If you're a faculty member at a university, it is always best to check with your current administrators on best practices and policies when dealing with plagiarism in any form.

Appendix: Academic Honest Policy

Adler University seeks to establish a climate of honesty and integrity. Any work submitted by a student must represent original work produced by that student. This could include, but is not limited to, coursework, presentations, and other professional activities. Any source used by a student must be documented through required references and citations, and the extent to which any sources have been used must be expressly stated in the work.

Academic misconduct generally includes cheating, plagiarism, and research misconduct—but academic misconduct is more broadly defined to refer to any action that involves unethical, illicit, unauthorized, fraudulent, or inappropriate behaviors designed to provide an undue advantage or otherwise aid in whole or part with the completion of required work at Adler University. Students who commit academic misconduct, including (but not limited to) cheating, plagiarism or research misconduct, are subject to a failing grade for the assignment and course and, potentially, immediate dismissal from their program and Adler University.

A. Cheating includes, but is not limited to, the following examples:
   Unauthorized copying, collaboration, or use of notes, books, or other materials on examinations or other academic exercises including:

1. Sharing information about an examination with a student who has not taken that examination;
2. Obtaining information about the contents of an examination and/or assignment that the student has not taken;
3. Unauthorized use of electronic devices;
4. Text messaging or other forms of prohibited communication during an examination;
5. Having others complete coursework, write papers, or take tests/quizzes for you, thus representing another's work as your own; and/or
6. Unauthorized use and/or possession of any academic material, such as tests, research papers, assignments, or similar materials;
7. Collaboration on assignments that are designed to be completed on an individual basis, unless otherwise stated by the instructor.

B. Plagiarism, a specific subset of academic dishonesty, is the representation of another person's work, words, thoughts, and/or ideas as one's own. Plagiarism includes, but is not limited to:
    1. Copying material and/or using ideas from an article, book, unpublished paper, or any material or source found on the Internet without proper documentation of references and citations, or without properly enclosing quoted material in quotation marks. This includes material retrieved from or generated by artificial intelligence tools, including but not limited to ChatGPT.
    2. Resubmission of work done for one course, assignment, or task for another. This form of plagiarism does not typically involve the submission of the work of others, but instead, consists of representing as new work what has been previously submitted. Adler University further considers resubmission of work done partially or entirely by another, as well as resubmission of substantial or entire portions of one's own work done in a previous course or for a different professor, to be academic dishonesty, unless the student has received prior approval of the faculty, and the new assignment expands upon the original work;
    3. Minimally rephrasing, paraphrasing, or revising the work of others without proper citation or credit. Plagiarism also includes sentences that follow an original source too closely, often created by simply substituting synonyms for another person's words;
    4. Substantial utilization of the published or unpublished work of others without permission, citation, or credit—also known as "cut and paste" or "patch writing"—and including works retrieved from or generated by artificial intelligence tools such as but not limited to ChatGPT; and/or
    5. Purchasing or otherwise acquiring a work in its entirety and submitting it as one's own.

C. Research misconduct involves the misrepresentation of data or material in research, and includes but is not limited to:
    1. Misrepresentation of how much effort was expended, or the extent of original contribution made to a research project in which multiple contributors took part;
    2. Withholding data or materials, involving the refusal to make available for inspection the raw data and sources for student research;
    3. Data manipulation, involving the suppression or changing of study data to facilitate a desired outcome;
    4. Data fabrication, involving the intentional production of false or invented study or research data and representing such data as genuine; and/or
    5. Data falsification, involving the intentional alteration of study or research data and representing such data as genuine.

Academic misconduct allegations are referred to the appropriate person or committee on each campus. All occurrences of academic misconduct, whether inadvertent or intentional, are serious and will be evaluated on a case-by-case basis and students may be subject to disciplinary action up to and including dismissal.

Ignorance of this policy or of any restrictions in place in a particular situation regarding the means by which any assignment, examination, or project can be completed is not a defense to an allegation of academic misconduct. It is each student's responsibility to promptly raise any questions or doubts regarding permitted methods or assistance to the appropriate instructor or advisor. Depending on the severity of the academic misconduct at issue, the level of training, and circumstances associated with the misconduct, consequences can range from failure on specific assignments, or required supplemental education, to dismissal from the student's program and/or Adler University.

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Enhancing Student Engagement and Learning Outcomes in an Online Course Through Reflective Journaling

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Abstract

This study examines the impact of weekly reflective journaling on student learning, engagement, and course satisfaction in an online undergraduate course. Seventy-three students enrolled in two sections of the same course, one incorporating reflective journaling and the other completing content-related exercises instead. Student learning was assessed through final course and project grades, while engagement was measured using the SEI-C, and satisfaction was evaluated using the IDEA survey. Results indicate that students in the experimental group had significantly higher final grades and final project scores. Although total engagement scores did not significantly differ, cognitive engagement was higher in the experimental group. Course satisfaction ratings were also greater among students who engaged in reflective journaling. These findings suggest that reflective journaling fosters deeper engagement with course material and enhances learning outcomes. Future research should explore additional factors influencing the effectiveness of reflective writing, such as study habits and student motivation, to further understand its role in academic success.

Introduction

In *How We Think*, American psychologist and education reformer John Dewey (1933) identified reflection as both a critical component of the learning process and a foundational element of his pedagogical philosophy. Employing reflection is a constructivist approach that encourages students to connect classroom material to personal real-world experiences to improve understanding (Dewy, 1933). Reflective journaling promotes independent learning by encouraging students to apply course terms and topics to their own lives through writing (Fritson et al., 2011). The positive impact of reflective journaling in college students is multifaceted and without restriction to a particular discipline. Previous research has shown that reflective journaling increases quiz scores in engineering students (Burrows et al., 2001), improves clinical skills and quality of care in nursing trainees (Murillo-Llorente, 2021), and predicts higher quiz grades in psychology students who connect lifespan development theory to their own childhood or parenting experiences (Fritson et al., 2016). When audio recorded, reflective journals allowed for language practice in an ESL course and gave students a safe place to discuss their adjustment to life in the United States (Dantas-Whitney, 2002).

Reflective journaling also offers valuable insight to instructors about their students. In a first-year seminar, reflective journaling provided the instructor with information about the unique challenges students were facing, which enabled her to better meet their needs (Everett, 2013). Furthermore, students are more likely to engage with coursework, attend class, and participate in discussions when they feel that instructors care about them and are willing to offer support (Klem & Connell, 2004; Libbey, 2004). The incorporation of reflective writing into course requirements provides a myriad of benefits to both the student and instructor but remains understudied in observing links between reflective writing and certain student outcomes.

Purpose

This study aimed to examine the effects of weekly reflective journaling in two sections of an online course. Both sections were taught by the same instructor, covered identical content, and included the same assessments. However, one section incorporated weekly reflective journaling assignments, while the other did not. The study compared student learning, engagement, and course satisfaction between the two groups.

Methods

Participants

This study was conducted in two sections of a general education undergraduate course at a large public university in southeastern United States. A purposive sample of 73 students in two sections of an online course participated in the study. The experimental section (n=48) included weekly journal assignments, while the control section (n=25) did not include journal assignments.

Given that the course was part of the core curriculum, the students represented different academic majors, including psychology, social work, engineering, kinesiology, nutrition sciences, biology, finance, and marketing. The course *Psychology of Adjustment* consisted of 14 weekly modules of textbook readings, instructor video lectures, supplemental readings, online activities, and various assessments. Both sections had the same instructor, and the instructional method was kept consistent apart from the journal assignments. Participants in the experimental group completed weekly reflective journal entries while those in the control group instead completed content-related exercises.

The sample comprised 42 females and 31 males, with an average age of 22. The majority of participants were Caucasian (68%), while 24% were African American, and the remaining students came from diverse ethnic backgrounds. Most participants (85%) were full-time students, and 25% were first-generation college students. The class distribution included 72% freshmen, 20% sophomores, and 8% juniors. No seniors were included in the sample.

Materials

Student Learning

Student learning was assessed through final course grades, which included two proctored online exams (consisting of multiple-choice and short-answer questions), online discussions, and a final project which required critical thinking application. The only difference in course requirements was the reflective journaling component for the experimental group. Journals were evaluated for completion, format, and timely submission. Control group students completed practice quizzes worth equivalent points based on completion and timely submission.

Student Satisfaction

Course satisfaction was evaluated using the Individual Development and Educational Assessment (IDEA, 2016) survey at the end of the term. Students rated their progress on a Likert scale ranging from 1 (“no apparent progress”) to 5 (“exceptional progress”). Research has validated the IDEA survey's reliability and its correlation with actual student learning outcomes (Benton, Duchon, & Pallett, 2013).

The survey was administered online, and students were reminded to complete it before the semester’s end. The study analyzed IDEA scores on overall teaching effectiveness and students’ progress on selected course objectives. The learning objectives that were selected for the two sections of the course included: Learning to apply course material (to improve thinking, problem-solving, and decisions); Developing specific skills, competencies, and points of view needed by professionals in the field most closely related to this course, Gaining a basic understanding of the subject (e.g., factual knowledge, methods, principles, generalizations, theories), and Learning to apply knowledge and skills to benefit others or serve the public good.

Student Engagement

Engagement was measured using the Student Engagement Instrument – College version (SEI-C), which has strong psychometric properties and has been validated across various educational research (Fredricks et al. 2004). The SEI-C captures students' cognitive and affective engagement. The Cognitive domains include Control and Relevance of School Work; Future Aspirations and Goals; and Intrinsic Motivation. The Affective domain includes Teacher-Student Relationships; Peer Support at School; and Family Support for Learning. Students rated their engagement on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree).

Procedure

Students in both sections used the same instructional materials (lectures, videos, readings) and completed identical content-based assignments. However, the experimental group submitted weekly reflective journals, responding to prompts related to goal setting and self-evaluation. These journals were private between the student and instructor. In total, students in the experimental group completed 14 journal entries. The control group, instead of reflective journals, completed content-related practice quizzes.

Design

This retrospective study collected demographic and evaluation data after semester completion. The dependent variables included final grades, student engagement, and course evaluations. Paired-samples t-tests compared the outcomes of the experimental and control groups.

Results

Final course grades were significantly higher in the experimental group ($M = 83.96$, SD = 7.12) compared to the control group ($M = 80.32$, $SD = 7.01$ $p < 0.05$). Additionally, final project scores were significantly higher for the experimental group ($M = 84.71$, $SD = 6.61$) than for the control group ($M = 77.40$, $SD = 6.61$, $p < 0.05$).

Although total SEI-C scores showed no significant differences between the groups, students in the experimental group scored higher on the cognitive engagement domain, which included future aspirations, control and relevance of schoolwork, and intrinsic motivation ($M = 4.4$ vs. $M = 4.0$, $p < 0.05$).

Reflective journaling also positively impacted student course evaluations. The experimental group reported higher overall satisfaction ($M = 4.7$ vs. $M = 4.3$, $p < 0.05$) and greater perceived progress on learning outcomes ($M = 4.8$ vs. $M = 4.3$, $p < 0.05$).

Discussion

This study examined whether journal writing enhances students' academic performance and course satisfaction. The findings indicate that students who engaged in reflective journaling outperformed those who did not, as evidenced by significantly higher overall grades, as well as improved cognitive engagement and project scores in the experimental group compared to the control group. These results align with the study by Chen, Kinshuk, Wei, and Liu (2011), which highlights the role of reflection in enhancing learning outcomes. One possible explanation is that reflective journaling fosters metacognitive awareness, helping students recognize and refine their own learning processes, which promotes deeper learning and better academic achievement.

The effectiveness of journal writing in improving course performance depends on students' active engagement in reflective thinking, which makes learning more meaningful. It is important to note that the journal assignments in the course were not designed as a direct exam preparation tool. Instead, they aimed to encourage students to engage more actively with the course materials, thereby enhancing their comprehension and overall learning experience. However, regardless of the extent of reflection, effective retention still requires dedicated study time and appropriate learning strategies. Future research should explore how variables such as study habits, study methods, and the depth of journal reflection influence the effectiveness of journal writing. Additionally, factors such as students' overall ability and motivation should also be considered when assessing the impact of reflective journaling on academic performance.

The benefits of reflective journaling extend beyond any single course or discipline. Engaging with subject matter through reflection, whether in journal writing or other formats, allows students to connect with information on a deeper, more personal level, fostering critical thinking and intellectual growth. As Thorpe (2004) emphasized,

reflective journal writing contributes to "deep learning, more than short-term, rote memory work." By providing students with opportunities to practice meaningful reflection, journal writing supports the development of higher-order thinking skills and promotes transformative learning. As educators, we have a responsibility to cultivate reflection, critical thinking, and meaningful learning experiences in our students. Reflective journaling is a valuable method for achieving this goal, and its potential merits further exploration.

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Analysis and Evaluation of an Information Technology Doctor of Science Program

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Abstract

Doctoral completion rates have been studied for decades. Studies have focused on progression rates, completion rates, and program design while qualitative studies have focused on student experiences through the terminal degree attainment process. Successful programs are those carefully designed and executed while continuing to refine the doctoral degree experience and welcoming new cohorts of students to the degree program. This paper sought to fuse an examination of a program's design with the inaugural cohort experience and the second cohort experience. This paper's focus was to explore the inaugural cohort experiences of doctoral students in the School of Computing Doctor of Science in Information Technology degree program at Middle Georgia State University, a specialized Doctor of Science terminal degree program for working technology professionals and technology pedagogical practitioners. This program was originally designed for two face-to-face short residencies and two years of compacted, online coursework. The program's final requirement was designed as an action-research information technology project rather than a dissertation. The degree conferred was a Doctor of Science in Information Technology with many of the program's characteristics mirroring the successful design of the Robert Morris University program. Overall, participants noted satisfaction with the quality and value of the Middle Georgia State University doctoral program, the cohort-based model, and the integration of research into course design. The students identified goal achievement, research and technical writing, adaptability, and leadership as skills enhanced by the program's coursework. Students denoted the need for increased pedagogical emphasis on research topic development, research writing synthesis, and even more mentoring/advisement through the program's progression. Through qualitative analysis, the students shared their challenges to completion to be dedicating time to the program, enduring the intensity of the program, and the need for more formalized, institution-instigated interaction among cohort participants. Based on the findings, several implications for practice are presented. Findings were synthesized with the design of the program resulting in a program evaluation for program enhancement and degree progression pathway experiences.

Keywords: doctoral degree, completion, program evaluation, cohort-based model, specialty degree, information technology, student perceptions, student experiences.

Introduction

Doctoral program completion rates have grown strongly over the last three decades. (Hoffman et al., 2019). Despite a temporary decrease during the Covid-19 pandemic, acceptance and completion rates continue to show a steady increase in students completing their doctoral degrees (Stevens & Caskey, 2023). Benefits of doctoral degree completion include strengthening leadership skills, building scholarship and contributing new research findings and knowledge (Rigole, 2019). The degree program's goal was established as paving the way for practitioners to succeed in the corporate, government, or non-profit setting. Although the number of online practitioner-focused online doctoral programs has been steadily increasing, program evaluations to study the efficacy and explore outcomes of specialized terminal degree programs are limited (Arslan-Ari et al., 2020). Exploring student experiences and perspectives is important to high completion rates and quality student contributions to the knowledge base (Ari et al., 2022). The goal of this paper was to explore the student experiences and the setup of the program, and conduct a detailed program evaluation, which, as defined by Patton (2002), is the systematic collection

of information about the activities, characteristics, and outcomes of programs to make judgments about the program, improve program effectiveness, and inform decisions regarding future programming. The following questions were explored:

1. What are doctoral students' experiences in a specialized doctoral degree online program with two limited on-site residency weeks?
2. What opportunities and challenges do students identify based on their experiences in the program?
3. What leadership and information technology characteristics were strengthened by completing the program?
4. Based on their experiences, what suggestions do the completers have for students to complete an online doctoral degree with limited face-to-face residency experiences?

Overview of DScIT Degree Program

In 2021, the Middle Georgia State University School of Computing leadership, with the support of university leaders, presented a unique proposal to the University System of Georgia Board of Regents. The School of Computing submitted a program implementation proposal unlike any other degree offered in the University System of Georgia, a 26-institution publicly funded entity serving over 340,000 students with approximately 70,000 graduates per year (Humphries, 2023). The Doctor of Science in Information Technology degree was proposed to serve two purposes: to serve working technology professionals to support skills and knowledge acquisition to assume IT leadership roles and to provide an opportunity for working professionals to pursue lifelong learning and engage in research to adapt and grow as technology organizations evolve (Rigole, 2019).

The program was one of a kind in the University System of Georgia, and it was a "unique to the Middle Georgia region" design (Rigole, 2019). The program's coursework was designed to provide an interdisciplinary structure blending innovation, strategy, and technology to "empower world-class organizations (Rigole, 2019). The program was tailored to begin and end with in-person week-long residencies followed by 54 hours of concentrated, online coursework, and the final requirement of the program was "an applied research project allowing students to produce original research findings for complex information technology challenges" (Rigole, 2019). The program was designed as a progressive, cohort-based model which does not allow for part-time participation.

Utilizing the well-established model of the Robert Morris University Doctor of Science in Information Technology program, first offered in 2005, the MGA Doctor of Science in Information Technology degree is similar to a traditional Doctor of Philosophy (Ph. D.) program as both types of programs offer in-depth knowledge and skill acquisition and development while engaging in synthesis of known subject-matter principles and expertise; however, the Doctor of Science in Information Technology degrees at Robert Morris University and at Middle Georgia State University were designed to institute programs to foster student development of research which makes contribution to the knowledge of professional practice" versus the traditional PhD program which emphasizes filling gaps of any topic at all within the field of study. The DSc program's goal was to guide student research related to the candidate's own field of professional practice in their own working lives. (Kohun & Ali, 2005; Costley, 2019; Bourner et al., 2001).

The program was designed so each cohort and sub-cohort progressed through each course together, and the coursework was designed so students began the program with a single ITEC7000 introductory course focused on a development of a variety of skills and capacities to succeed as a doctoral student (Floyd, 2020). The course was also designed as a vehicle for socialization into the shared community of the degree program. At the end of the initial course, a seven-week online course, students were expected to arrive in Macon, Georgia, the main campus of Middle Georgia State University, to fulfill a week of face-to-face introductory activities designed to foster communication and collegiality for the degree's two years of online courses.

ITEC7000's objectives were designed to support the student's efforts to satisfy the program's expectations. Students were to begin a reflection process throughout the program, connect with faculty and student support networks,

understand the program's overarching expectation of original research, and construct a plan to finish the program by building and sustaining quality learning activities including professional writing, goal setting, and analysis (Floyd, 2020). In addition to the MGA course platform which allows for formal course dialogue and interaction, MGA doctoral candidates were provided dedicated time in ITEC7000 to network and set up an informal platform for interaction based on the group's consensus. Some groups chose platforms such as Telegram, Discord, WhatsApp, Microsoft Teams, or a combination of platforms. In this cohort-agreed upon platform, no faculty members were present, and students were free to network organically (Mercer, Residency Week Schedule, 2022).

After completion of ITEC7000, each sub-cohort was scheduled into four eight weeks per semester courses for the following two years. Coursework included first year courses on decision making, design thinking and innovation, leading disruptive technology, and information technology strategic planning. Year two courses include data science and analytics strategy, organizational strategy for cybersecurity management, technology policy, compliance and legal adherence, and information technology project and program management. The coursework was designed to culminate with qualitative and quantitative research analysis, leadership development, and research design proposal to support the student's final applied learning research project (Sandoval, 2022).

Program Initial Implementation

The program began with solicitation of applications in the Fall of 2020. There were over 100 applications for the new program, and the total enrollment was set to 30 with each sub-cohort expected to be 15 students in each. Cohort 1, Sub-cohort 1 totaled13 after two dropouts, and Cohort 1 Sub-cohort 2 totaled 15 after one dropout in the initial cohort. A total of 28 students finished the program at an overall completion rate of 93% for the initial cohort. Cohort 2 Sub-cohort 1 started with a total of 14, and 10 finished the program. Cohort 2 Sub-cohort 2 started with a total of 12, and 11 finished. A total of 21 Cohort 2 students finished the program at an overall completion rate of 81.67%.

Of note, the ITEC7000 Summer Doctoral Seminar 2020 experience modality was determined by the COVID-19 pandemic for Cohort 1. With facilities shuttered, and face-to-face classes canceled in the University System of Georgia until August, 2020, the July face-to-face residency experience for the initial cohort became a series of online meetings through Microsoft Teams as well as asynchronous experiences (https://www.mga.edu/coronavirus/docs/MGA_Workplace_Health_and_Safety_Reopening_Plan.pdf.) Many programs were forced to be exclusively online during the pandemic (Knox, 2024).

Literature Review

The purpose of the study was to glean findings to use in the enhancement and continued revision for quality of the Doctor of Science in Information Technology Program at Middle Georgia State University. This study was approached using the Stake's Responsive Evaluation Model (Stake, 2004) as the model was established to be participant-focused with contextual understanding following emergent design. This allowed for a naturalistic exploration of the program due to the program's brief implementation history and a limited number of completers. This framework served to support the study of a specific, contextualized, specialty terminal degree program for a specific public university.

With a review of similar programs, the literature review was conducted with a scoping outlook to procure and synthesize findings regarding similar programs in design and outcome (Creswell, 2017). The scope of the literature review was not constrained by geography or date; however, the specialty nature and the limited number of institutions conferring Doctor of Science in information technology degrees correlated to few recent program evaluations. Scholarly databases including Google Scholar, University System of Georgia GALILEO databases, and Education Resource Information Center (ERIC) were searched using keyword terms. Those search results were evaluated for relevance, and results were coded for germaneness.

Success in online doctoral programs continues to be a relevant topic in academia. As Terrell and Lohle (2016) noted, the majority of doctoral students are adept to complete the work, and the doctoral students have completed successfully the benchmarks and requirements of a bachelor level program and a master's degree program to be

eligible for a terminal degree experience, so the question remains as to why the attrition levels are much higher than those at the master's degree level. Doctoral granting institutions are well-served to engage in program analysis and evaluation (Studebaker & Curtis, 2021). Because completion rates are the pivotal measurement for program success, this literature focuses on completion reasons found in a scoping review of the literature. According to Ivankova and Stick (2007) completion, regardless of format and program design, can be summarized in four factors: program quality including relevance, flexible learning formats, effective support and assistance through quality advisement and student self-motivation. A program should be built upon a foundation of clarity of expectations, relevance, consistent course design, and quality interactions between faculty and students (Berry, 2017). Online doctoral program students have cited high costs, poor program fit, lack of technical support, and lack of support services for online students as pivotal factors for attrition. Berry states lack of community is a significant factor in attrition. Isolation is a self-reported determinant for most students who do not complete a terminal degree program delivered through online delivery methods (2017).

In online programs in which the student feels isolated, the time to degree completion is increased in non-cohort programs (Ari et al., 2022). Doctoral programs need to facilitate formal and informal opportunities for students to engage and academically commune with fellow program participants. (Hoffman et al., 2019). Having a cohort-based program scaffolds the opportunity for community. Incorporating live interactions with defined cognitive and technological purposes supports development of advanced skills, cognitive processes, and knowledge required by nontraditional online doctoral candidates (Russell, 2021). These live interactions build community (Berry, 2017).

Incorporating formal but limited face-to-face opportunities in the program design has been shown to reduce isolation of online students (Burrus et al., 2021). Including specific learning activities based on motivation and self-learning skills is important to the success of an online doctoral program (Costley, 2019). Providing quality feedback and formal advisement are crucial elements for online doctoral program completion (Kohun & Ali, 2005). Finally, having a built-in final project including research, writing, revision, and completion support is consequential for many participants in determining when and how well they complete a terminal degree program (Ari et al., 2022).

Designing a pedagogical program which addresses specific information technology leadership skills is challenging, but appropriate for today's candidate (Zinner et al., 2022). The scope of the program should include content relevant for the information technology leader involved in strategic planning and decision making while also enhancing skills in adaptability and resource utilization (Gravett, 2021). The information technology specifics must be colligated with instructional time for motivation, self-learning skills, data analytics, research methods, and technical writing skills (Lara-Steidel, 2022). These academic skills must be balanced with practitioner competencies and knowledge. This is challenging in a limited time, lockstep, cohort-based program (Kohun & Ali, 2005; Hoffman et al., 2019).

Overall, the analysis of Doctor of Science in Information Technology programs in empirical articles is limited due to the specialized and infrequent implementation of this specialty degree type, so the goal of this paper was to highlight the experiences of the first two degree cohorts for Middle Georgia State University.

Methodology

In 2023, permission was granted by the Middle Georgia State University Institutional Review Board to solicit responses from the 2023 DScIT completers. A comprehensive program evaluation research plan was presented, approved, and greenlighted for distribution to the recent graduates of the MGA DScIT program. The survey design was deemed adequate to explore the related research questions while protecting and minimizing the potential risks to provide program evaluation information to benefit the overall program and future completers' experiences in the program. Anonymity was observed through choice of survey tool, administration, and collection of data. As the data were collected as part of a program evaluation, the completion of the end of program survey was optional, and this was stated in the introductory message to potential participants. Only those who opted to participate did so.

To understand Doctor of Science in Information Technology program perceptions about the program they experienced, an online, end-of-program evaluation survey was administered several months after students completed the program. Data were collected from students who graduated in May 2023 and those students who graduated in

May 2024. Two initial cohorts began the program (n=56). The survey was administered to the students who completed the program with 49 total surveys distributed anonymously over a two-year period after each cohort graduated.

The program evaluation survey included 19 Likert-type items focusing on skills the students felt they acquired through the program. All of the skills in the questions were outlined in the course guides, course objectives, program objectives, and syllabi for the program. These included such competencies as research/technical writing skills, leadership, adaptability, data analytics, mentoring, collaboration, strategic planning, decision making, and goal setting. The survey also included open-response items. These items included an invitation for suggestions to improve the program and an opportunity to highlight memorable learning experiences in the program. Students were also provided an open-ended question to provide any other information they would like to provide about their experience in the program.

Anonymity was built into the survey administration and analysis. The evaluation survey did not include any demographic information to identify an individual student. Although reminders were sent regarding survey completion, only 20 students completed the survey.

Since the initial cohort began the program in Summer of 2021, each cohort had a graduation rate of 80% or higher. The first cohort graduated at a 93% on-time completion rate. The second cohort began the program in Summer 2022, and their ITEC7000 initial course ended with a face-to-face residency to prepare them for the two years of online coursework. Their completion rate was 81.76%.

Results

Impact of the Program on Students' Competencies

Students were asked to rate the impact of the program on their specific knowledge and skills outlined in the following areas: presentation skills, time management, teaching/sharing, mentoring, teamwork, skills for working successfully in diverse teams, goal setting, goal achievement, research/technical writing skills, technical support skills, project management, decision making, strategic planning, data analytics, skills related to technology policy making and compliance, future casting, adaptability, stress management, and leadership. Overall, the mean scores of students' responses across both cohorts indicated the impact of the program on goal achievement, research and technical writing, adaptability, and leadership. The lowest mean scores were those for technical support skills, stress management, and future casting.

Qualitative Findings

The three open-ended survey questions were analyzed using inductive analysis (Bingham, 2023). The responses were reviewed for emerging themes and commonalities.

For learning highlights, participants in both cohorts noted the systems design course as quality and applicable to their work lives. Several students noted the richness of data analytics skills including qualitative and quantitative analysis strengthening through real-life data sets. Students noted the disruptive leadership course as applicable to their lives, and a common theme in the responses was the learning through community building and sustainment through student-driven channels and platforms beyond the classroom setting. An overarching theme for both cohorts was the community and connections they made throughout the program. Several pointed to the structure of lock-step cohort-based programing as a positive of the program. The cohort who had the opportunity to have a face-to-face initial four-day residency experience pointed to meeting faculty members, meeting each other, and learning the expectations of the program as a highlight of the program.

In terms of suggestions for the program, there were three emerging themes. Students would like to have more focus on research throughout the program with research courses provided back-to-back. Students requested courses with specifics related to cybersecurity, artificial intelligence, and software engineering. Students would like even more

consistency throughout the course progression. They suggested deadlines on the weekends to accommodate work and family schedules. Students also encouraged consistency in syllabi and course content structure in every course.

For additional information on the program, the second cohort's survey respondents noted the importance of the first face-to-face residency in the design of the program. Second cohort members regarded the experience as beneficial for making connections with fellow cohort members while also having an opportunity to meet faculty members and get questions answered about the program in a group setting. Second cohort members also noted the first residency as an opportunity to network and have experiences beyond the classroom through planned evening activities. Both cohorts made mention of resources for the program. Students appreciated having customized on-demand librarian support with extensive resources. Finally, students were positive about the real-life examples, case studies, data sets, and caring faculty who taught their courses.

Discussion

Overall, students were satisfied with the Doctor of Science in Information Technology program at Middle Georgia State University. Student responses to the survey instrument indicated the doctoral work did indeed prepare them to be scholarly corporate and non-profits, effective career academic scholars, or both. With a completion rate of over 80% for the first two cohorts, the program's design of cohort-based with lockstep eight weeks, concentrated courses were substantiated when examined with the end of program survey, completion rates, and open-ended comments of completers. Student perceptions indicated they received applicable leadership and information technology skills and knowledge to prepare them to be terminal degree holders in the work or academic settings. The face-to-face residency was noted by students in the second cohort as an effective practice of the program.

Students noted not all participants in the program seemed ready or capable of doctoral level work, and this was evident to cohort members during group projects. Several comments noted the selection process should be a rigorous process.

Implications

With this paper, the goal was to evaluate the impact and quality of a DScIT program through the lens of recently graduated doctoral students of a specific program. Based on the findings, the MGA School of Computing Doctor of Science in Information Technology program is meeting the goals set forth in the initial proposal to the University System of Georgia (Rigole, 2019). As additional cohorts join the program, each of these completing cohorts should be surveyed. The data provided by graduates is invaluable to program design and evaluation, and with faculty and leadership input, more questions should be added for even more comprehensive analysis of the program in the years to come.

The findings emphasized the value of the lockstep cohort-based model for a limited interaction online specialty terminal degree program. Findings revealed an in-person residency experience may support completion rates for some students (Finch et al., 2021). Students found this to be an important part of their progression in the program, and this should be considered when designing or refining similar degree programs. Students found the embedded research process to be beneficial for their completion, and this key finding supports implications that research should be ongoing, relevant, and rich in real-life connections (Costley, 2019). Finally, program evaluation is important to the continued success of a degree. Assessing doctoral students' experiences after their completion is essential for a program's health and relevance.

Universities may want to build upon this knowledge by expanding the program offerings for a Doctor of Science program to fulfill the need for professional terminal degree programs which support the development and furtherance of knowledge and skills of specialty areas such as information technology (Gravett, 2021).

Conclusion

MGA Doctor of Science in Information Technology program should continue to survey doctoral program completers for data analysis. This data analysis will provide critical understanding of program design and needs

(Hill & Conceicao, 2020). The next step is to continue to survey completers to replicate and expand this program evaluation to ensure findings are generalizable. Having a degree program built upon the successful special program of Robert Morris University's model has proven to be achievable while challenging for a strong majority of students who applied, were accepted, and chose to participate in the Middle Georgia State University program.

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Revitalizing Learning Resources through the Lens of Cognitive Load: LibGuides at the University of North Georgia Libraries

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Abstract

In early 2023, the University of North Georgia Libraries embarked on a long-term project to revamp and revitalize our collection of online research guides. This scholarly professional narrative describes the impetus for this effort, outlines the history of our use of the LibGuides platform, and explains our adoption of Cognitive Load Theory as a guiding principle for our redesign work.

About LibGuides

LibGuides (https://www.springshare.com/libguides) is a content-management system designed by and for librarians. The LibGuides system is one component of a suite of products developed by Springshare, a company founded in 2007 by ed-tech entrepreneur Slaven Zivkovic (*Company Info*, n.d., "Mission" section). LibGuides is used by a wide variety of libraries – academic, public, school, and special – as well as archives and museums as a web-authoring and hosting tool to provide information and support services for their users. Some libraries build and host their entire websites using LibGuides; others use the platform to create pathfinders and other research and instruction support resources or as a marketing and communication tool. LibGuides features a WYSIWYG HTML editor enhanced with unique features designed to work with library catalogs, chat reference apps, and other library-specific tools. The LibGuides platform lets users create templates and build lists of reusable links, as well as allowing content to be distributed to and published on websites, RSS feeds, and in courseware.

Project Background

LibGuides at UNG

The UNG Libraries' current efforts to overhaul and reinvigorate our use of LibGuides have necessarily been informed by of my personal professional experiences with the LibGuides platform and with research guides in general. Early in my career as a reference and instruction librarian, I worked at a small, private liberal arts college that lacked the budget to subscribe to the recently released platform, despite its celebrated affordability. Recognizing the need for and value of online research guides, we built HTML-based pathfinders directly on our library website.

When I joined the library faculty at Gainesville State College in 2011, I was thrilled to learn that my new employer used the LibGuides platform. In fact, they built guides in abundance. At GSC, librarians built and maintained research guides, and LibGuides accounts were also made available to any college faculty or staff member interested in using them to support classroom instruction. As a result, hundreds of guides, many of them lacking any relationship to library resources or services, were created; a considerable number of these guides were not regularly updated. Our library dean at the time, frustrated by the sheer number of ill-maintained guides and the library's lack of control over information resources paid for by the library's limited funding, had all the guides taken down and instituted several new policies. Guides were selectively reinstated on an as-needed basis, with all guides being "owned" by a member of the library faculty. Guides to support course assignments and library classroom instruction efforts were no longer allowed; guides were instead limited to broad subject-focused pathfinders only.

In 2013, GSC was consolidated with North Georgia College and State University to form the University of North Georgia. The libraries at the two constituent institutions had, as it turned out, vastly different histories with and expectations for LibGuides. At NGCSU, the platform was used for subject-based research guides as well as course-related library instruction support. The NGCSU librarians additionally used LibGuides as a communication and record-keeping tool for collection development and management. The guides were all library-focused, built and supported entirely by librarians. At consolidation, NGCSU's research guides were retained, GSC guides were integrated into the NGCSU menu, and GSC's policy against any guides other than subject pathfinders was carried

forward. That policy was not always followed, however, and some librarians, particularly new librarians who came to work at UNG from libraries with far less restrictive philosophies, continued to use the platform to create course- and assignment-related guides and for other purposes. With no individual or team officially charged with administering the guides, these "rogue" guides were semi-hidden and kept under the radar. Other librarians, in an attempt to follow the letter of the policy, used free online tools like Flipgrid and Sutori to build external resources. As a result, there was no centralized bank of the library's research guides for patrons to turn to and no oversight aside from a short-lived effort to create a general design template and encourage accessibility. Guides continued to be inconsistent, overwhelming, and disorganized, and the platform was underused.

The COVID Shutdown

The COVID-19 pandemic and attendant shutdown in 2020 served as an object lesson for many in academia in the vital role of robust online instructional tools. At the UNG Libraries, we did almost no online library instruction prior to shutdown, and that gap, along with our restrictive use of LibGuides, meant that we were starting entirely from scratch when our administration announced a shift to online-only classes. Credit-bearing courses would be taught through D2L Brightspace, UNG's learning management system. Most of UNG's classroom faculty had only used this platform for their promotion and tenure portfolios, not for teaching, so the learning curve was incredibly steep for all involved. With all classes shifted onto D2L, library instruction followed, and we began creating videos, slideshows, and handouts for faculty to upload into the courses for which we had originally planned to conduct in-person presentations. We did not even consider using LibGuides to support our course-related instruction, entrenched as we were in our "no course guides" thinking.

Soon enough, we began to encounter issues with our D2L-focused approach. Classroom faculty continued to embed the videos and other tools we created in 2020 in their courses long after shutdown ended, reusing them semester after semester. With no ability to access subsequent courses or edit materials, we struggled to keep information updated and to maintain a presence for students. It became clear that we needed our own readily available slate of tools and tutorials that could be used inside D2L, but we needed to be able to manage access and keep editorial control over them. In other words, we needed our own instructional arena. We began investigating a variety of potential platforms, including open-source software like Guide on the Side, as well as commercially available information literacy tools from Credo Reference and Niche Academy.

The Turning Point

In the summer of 2022, I attended the annual conference for GALILEO, Georgia's statewide online library project. During the conference, Talia Richards, Springshare's Marketing and Social Media Manager, presented a session titled *Best Practices for Building LibGuides.* Early in her presentation, Richards discussed several "Big Picture Ideas," concepts she described as fundamental to designing and building LibGuides. Two of these ideas served as lightbulb moments for me and upended my thinking about the role LibGuides could and should play in our library instruction efforts.

First, Richards (2022) advocated for separate course and subject guides, citing research from Sara Roberts and Dwight Hunter in 2011. Roberts and Hunter noted that many students "do not connect with general subject guides, but do find use for guides that are focused on specific courses" (p. 73). This research-driven perspective ran completely counter to our subject-guides-only practice at UNG. Richards' presentation made clear the value of having separate groups of guides with distinct purposes and approaches and the role course guides could play in ensuring that content is manageable and meaningful for students (2022).

Richards (2022) also emphasized the need to design and build LibGuides with a mind to reducing cognitive overload for students. The sense of overwhelm that most of us felt during the COVID shutdown was still fresh, and mitigating the instructional challenges that created was a prime concern for teaching faculty and librarians alike. Richards quickly outlined the very basics of Cognitive Load Theory and talked about how designing guides with its principles in mind could result in better, more useful learning tools. She particularly mentioned the importance of standardization in aiding guide navigation and how course guides reflect the application of cognitive load principles.

Richards' brief session was enlightening, and it became instantly apparent to me that we already had the tool we needed in LibGuides, but we had to shift our approach, change our policies, implement and manage the platform properly, and give designated people authority and responsibility for overseeing the effort.

Cognitive Load Fundamentals

In the simplest terms, cognitive load is the amount of mental effort it takes to process and learn new information. First developed by psychologist John Sweller (1988), Cognitive Load Theory (CLT) posits that working memory, where information is temporarily held before being moved into long-term memory, "has a limited capacity and that overloading it reduces the effectiveness of teaching" (Loveless, "What is Cognitive Load Theory?" section).

Sweller et al. (1998) identified three types of cognitive load – intrinsic, extraneous, and germane – each of which places a different kind of demand on working memory's ability to process information and move it into storage. Rebecca Cuevas (2021) has created an excellent metaphor for explaining these concepts. Cuevas likens a course to a "conveyor belt delivering packages of fresh new information straight to your learners' minds" ("The Root of the Problem" section). Those information packages must first pass through the "narrow doorway" ("The Root of the Problem" section) of working memory. Intrinsic load is the content of the package, or the inherent complexity of the subject matter itself. Content that is "large, heavy, or dense in its own right" ("Intrinsic Cognitive Load" section) creates a greater cognitive load. Extraneous load is the packaging ("Extraneous Cognitive Load" section), or how the content is presented. If information is conveyed in a distracting, disorganized, or overly complicated manner, it results in unnecessary extrinsic demands on working memory that interfere with processing. Germane load is effective package processing, or the "active engagement in the learning task" ("Germane Cognitive Load" section). It suggests that there is a sweet spot where learners apply appropriately challenging effort to move new information into storage schemas. Too little processing activity yields poor learning results.

As Chandler and Sweller (1991) explain, "cognitive load theory *[sic]* suggests that effective instructional material facilitates learning by directing cognitive resources toward activities that are relevant to learning" (p. 293). Thus, the goal when developing "cognitively guided instructional packages" (Chandler & Sweller, 1991, p. 293) is to create a balance: managing intrinsic load, minimizing extraneous load, and maximizing germane load.

The New and Improved LibGuides at UNG

With CLT as our framework, we moved forward on a complete resurrection and overhaul of our LibGuides. My first step was to work with our administration to upgrade our LibGuides subscription from the basic version of the platform to LibGuides CMS, which offers several added functions, including the ability to divide guides into groups, customize their look and feel, and control publication and access. Next, with the support of our current Dean of Libraries, I formed the LibGuides Editorial Team (LET), which includes myself and three reference services librarians who have likewise expressed an enthusiastic interest in what we as a library can achieve by doing more with our guides.

The Work of the LibGuides Editorial Team

The LET began its work in earnest in the late spring of 2023. Our very first task was viewing Richards' illuminating presentation, and all members of our team experienced lightbulb moments like my own. We then began to research. We studied CLT in more depth, investigated best practices in guide design, examined well-established web design principles, and reviewed guide usability studies done at other academic libraries. We spent several months developing a new philosophy of LibGuides at UNG and deciding upon policies and practices that would support that mindset.

With the upgrade to LibGuides CMS, we now could designate guide groups, allowing us to organize our guides into menus and customize the design of each collection. We initially opted for four main varieties: 1) Course Guides, for providing class-related instruction support, 2) Research Guides, made up of subject guides as well as guides on broad research-related topics or skills, 3) Library Services and Events, to provide information on library operations, and 4) In-House Guides, which offer a place for documentation and training resources for our employees.

We opted to focus our first efforts on developing course guides. As course guides had been forbidden in the past, we hoped that starting our roll-out efforts with them would signal to library faculty and staff that we were adopting a new perspective. Course guides also gave us a new instruction service to roll out that could create immediate opportunities for our librarians to put our new tools into practice.

The LET next created a policies and practices guide, an internal resource for library personnel that shares the best of the information we found during our research and offers guidelines and step-by-step procedures for librarians to follow in planning, designing, building, and maintaining guides. We created a template guide, the Course Guide Blueprint, which provides a standardized layout with ready-made components to simplify guide-building, and we offered training and question-and-answer sessions to support the librarians. Finally, we developed a publication

workflow process using a unique feature of LibGuides CMS. When a librarian creates a new guide or builds new content on a pre-existing guide, the guide is submitted to the LET for review before publication to ensure that the guide follows our policies and is responsive and accessible. We also offer suggestions when a guide is designed in a cognitively overwhelming fashion. This level of oversight was missing from all prior LibGuides work at UNG. This added step not only ensures that our guides are effective and consistent, but it also keeps us in compliance with the university's online resources policy.

Early Reactions and Observations

The LET is monitoring the response to the Course Guides, noting data and feedback gathered through assessment tools as well as anecdotal evidence. Our initial sense is that students love the new guides, even commenting specifically on them in after-instruction surveys.

For example:

Question:

What was the most useful part of the library instruction you received?

Response:

The subject guides. I have never used this resource before, and it was nice for the librarian to make one specifically for our class. (LibGuides Editorial Team, 2025)

Classroom faculty have also welcomed the addition to our service offerings, asking librarians who use a guide in instruction sessions some variation of "Is this something new?"

Usage statistics gathered from within the LibGuides platform have also been encouraging and, at times, enlightening. LET member Sarah Grace Glover notes in a forthcoming book chapter that using a course guide in an instruction session for an introductory biology course led some students to explore a pre-existing subject guide for the discipline:

After teaching 3 sections of an introductory Biology course, I shared the link to the guide I created. A week after my instruction the guide had 60 views…. The course guide also linked out to our general Biology subject guide. Created in 2009, before my instruction session it had 60 views total, after the instruction session that number grew to 78. (Glover, "Discussion" section, para. 4).

Thus, a guide viewed an average of 4 times per year before being referenced in a course guide was viewed 18 times just in one week afterwards.

No change is universally applauded, however, and the greatest pushback to the work of the LET has come from within the library. While many UNG librarians have welcomed the new policies and practices and have been eagerly building and updating guides each semester, a small number of our faculty have been either indifferent or openly critical. Their resistance has ranged from a continued reluctance to create guides in general, to a disinclination to consult and follow the new guidelines, to explicit complaints about having to submit guides to a publication review process.

Our Next Steps

The LET has always recognized this project as a long-term effort, but as our work has gotten underway, we have begun to realize just how much work we have ahead of us to achieve our goals. In addition to expanding and maintaining the Course Guides, we have begun building Division Guides and Service Guides to provide information on library operations and policies. We have also undertaken a massive clean-up effort, catching up on years of deferred maintenance. We have eliminated over 16,000 unused link assets and streamlined and updated all the database asset entries.

Our next steps will be turning attention to "Quick Start" Guides (focusing on majors, academic programs, and disciplines) and Topic Guides (covering information literacy skills, resource types, and other library-related concepts). We are also investigating methods for integrating active learning tools into our guides for increased student engagement.

UNG's LibGuides project is evolving as the LET's work continues. We regularly pursue professional development opportunities to expand our skill sets, and we share what we have learned on cognitive load and guide creation by updating the policies and practices guide with this information. We also continue to encourage our library faculty colleagues to embrace the LibGuides platform. We have opened the guides as a platform for librarians to use in support of their conference presentations, in the hope that it will give them additional incentive, and we now ask faculty job candidates to create a guide as part of the on-campus interview process so that we are transparent in the significant role they play in our work.

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Game On! Harnessing Gamification and Storyboards as Creative Assignment Options

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Abstract

In today's dynamic and high-tech learning environment, offering flexible and innovative assignment options is crucial for engaging students across varied learning preferences and backgrounds. Alternative formats, such as gamification and storyboards, can boost engagement, spark creativity, and enhance learning outcomes in college classrooms. By integrating elements of game design and visual storytelling, educators can cater to multiple learning styles and simplify complex concepts. This paper explores practical strategies for incorporating digital tools in higher education, focusing on their influence on student motivation and engagement. It presents real-world, anecdotal examples used at American College of Education that highlight how these tools can effectively inspire learners of all learning styles, promote inclusivity, and improve student learning outcomes.

Introduction

In an increasingly dynamic and high-tech learning environment, traditional assignment formats often fall short in meeting the needs of all students. Educators face the challenge of engaging students with varying learning preferences. Classrooms consist of learners with varied backgrounds and skill sets, making it imperative for educators to adopt flexible and innovative approaches to teaching. Traditional teaching methods may not fully resonate with every learner, particularly in an era where students are accustomed to interactive and visual digital media (Jakieła, Świętoniowska, & Wójcik, 2024).

To address this issue, incorporating gamification and storyboards as alternative assignment formats offers an effective strategy for enhancing engagement, fostering creativity, and improving learning outcomes. By leveraging game design principles and visual storytelling, educators can appeal to a variety of learning styles, making complex concepts more accessible and memorable (Khaldi, Bouzidi, & Nader, 2023).

In distance learning administration, these challenges extend beyond instructional design to include course management, student engagement strategies, and retention efforts. Lampropoulos and Sidiropoulos (2024) compared online, traditional, and gamified learning environments over three years with 1,001 higher education students. Their study revealed gamified learning showed significant improvements in success rates (up to 39%), excellence rates (up to 130%), and retention rates (up to 42%) compared to traditional and online learning (Lampropoulos & Sidiropoulos). Administrators can leverage gamification and storyboards to enhance the structure of online programs, track student progress through interactive metrics, and provide alternative assessment methods that cater to various learning needs. By integrating these approaches at an administrative level, institutions can create more engaging and student-centered virtual learning environments while improving overall program effectiveness.

Engaging Through Gamification

Gamification involves integrating game mechanics such as points, challenges, and rewards into non-game contexts (Li & Liu, 2023; Khaldi, Bouzidi, & Nader, 2023). When applied to the higher education setting, it transforms mundane tasks into interactive and enjoyable experiences, fostering higher levels of engagement and motivation (Oksana, et al, 2022). For example, using leaderboards for synchronous participation with webcams, fun pop-

quizzes, or creating role-playing scenarios for problem-solving assignments motivates students to actively participate.

Gamification enhances intrinsic motivation and learning outcomes. Gamified elements positively impact engagement and knowledge retention, particularly when students experience a sense of achievement (Li & Liu, 2023; Mazarakis & Bräuer, 2023). This approach caters to various learners by offering multiple pathways to success. For instance, instructional designers could create virtual escape rooms where students solve puzzles related to certain topics, appealing to kinesthetic and visual learners alike. As another anecdotal example, a human resource student can participate in a gamified training module where they navigate workplace scenarios to resolve conflicts and improve employee engagement. Through this interactive approach, the student would learn practical strategies for effective communication, team building, and problem-solving in a dynamic environment.

Incorporating gamified elements such as leaderboards, progress bars, and achievement badges in learning platforms led to a measurable increase in student engagement (Li & Liu, 2023). While typical elements of gamification include points, badges, levels, challenges, or leaderboards, increasing student motivation is already possible by adding *just* one of those game design elements to the course (Mazarakis & Bräuer, 2023). In the virtual classroom, gamified assignments could include creating quizzes where students earn points for correct answers, unlocking new challenges as they progress, or collaborative activities where teams compete to solve problems.

Enhancing Creativity with Storyboards

Storyboards are the main gaming assignment format at the American College of Education, particularly since much of the asynchronous learning takes place. This innovative assignment format includes the use of visual narratives to help students conceptualize and communicate ideas. By organizing information into a sequence of images and accompanying text, storyboards can simplify complex concepts and enable students to demonstrate their understanding in a creative and accessible manner. Digital storytelling holds great potential as a social and interactive learning activity, offering an authentic approach to assessment (Spanjaard, Garlin, & Mohammed, 2023).

Gamification aligns with new generations', such as Generation Z's and Generation Alpha's, learning preferences (Jakieła, Świętoniowska, & Wójcik, 2024; Aghaee, & Karunaratne, 2023). Storyboards also encourage interdisciplinary learning, combining skills in visualization, writing, and critical thinking. Students who use storyboards as part of their assignments demonstrate higher levels of conceptual retention and problem-solving skills compared to those who rely solely on written responses (Ginting et al, 2024).

This method of instruction or use of storyboards also can improve teaching practices and better prepare graduates to enhance future careers. For example, accounting students can dive into data analytics by cleaning data, answering client questions, and creating visualizations like dashboards and storyboards. Not only do students gain accounting knowledge, but they also experience a hands-on, engaging way to learn data visualization.

Visual storytelling appeals to visual and kinesthetic learners who may struggle with text-heavy assignments. For example, in a marketing class, students could create a storyboard illustrating a customer's journey from initial brand awareness to purchase. The storyboard may highlight key touchpoints, emotions, and decisions, helping to identify opportunities for improving the marketing strategy. A storyboard could help break down intricate details into manageable, visually engaging steps. Storytelling can also be used for students to provide narratives on how a game can be designed and played.

Reaching and Inspiring Learners with Multiple Learning Styles

Gamification also nurtures a growth mindset by framing challenges as opportunities for improvement rather than tests of ability. This approach is particularly beneficial for students who might feel intimidated by traditional assessments. By allowing multiple attempts to achieve mastery, gamified tasks can reduce anxiety and encourage persistence. For example, applying the use of online quiz platforms like Kahoot and Quizlet in higher education can

enhance students' adaptive and social skills, facilitate rapid analysis of their progress, and simplify the delivery of new information (Oksana et al, 2022).

Such technology-based learning accommodates various learning styles, from auditory and visual to experiential. Students who might struggle with traditional formats, such as essays or exams, are offered alternative ways to demonstrate knowledge. For instance, a student with dyslexia might excel in creating a storyboard to illustrate a novel's plot rather than writing an analytical essay. These tools provide equitable opportunities for all students to demonstrate their understanding and skills.

Moreover, these methods foster inclusivity by valuing creativity and individuality. Instructors can tailor assignments to reflect cultural diversity, enabling students to draw from their own experiences and perspectives. For example, a gamified task could include culturally relevant scenarios, while a storyboard project might encourage students to share personal stories or traditions.

Practical Implementation Strategies

To effectively integrate gamification and storyboards, educators can adopt practical, step-by-step strategies. For gamification, an instructor can start by awarding badges or points for timely assignment submissions and then gradually introduce more advanced features like simulation games or interactive case studies. Tools like Kahoot, Quizlet, or Classcraft make it easy to implement gamified elements with minimal effort.

When it comes to storyboards, free platforms like Canva and Storyboard That, offer accessible templates and design features. Assignments that spark creativity and problem-solving, such as visualizing a game design, are particularly effective. Providing clear guidelines and examples helps ensure students grasp the assignment's goals and expectations. To effectively incorporate gamification and storyboards into college classrooms, educators can follow a structured approach:

1. Define clear objectives. Identify the student outcomes and learning objectives and align them with the chosen technological experience or assignment. For example, if the objective is for an education student to discuss the different learning theories, a storyboard could be created about multiple intelligences.
2. Use accessible tools. Platforms like Kahoot, Quizlet, and Canva can be used to create gamified activities and storyboards without requiring advanced technical skills. These tools are user-friendly and accessible to students with different learning styles and preferences.
3. Provide guidance and flexibility. Offer templates or samples to help students understand the expectations for gamified tasks and storyboards. Allow flexibility in the medium students use to accommodate different learning styles. Also, if a student does not get a correct answer in a scenario-based game, allow them to provide answers as to how they came to a particular conclusion, demonstrating critical thinking.
4. Incorporate feedback loops. For gamified tasks, use synchronous feedback to guide students toward improvement. Additionally, instructors can encourage peer reviews to promote interpersonal communication and gain additional ideas.

Distance learning administrators play a pivotal role in implementing these strategies by ensuring faculty have access to the necessary training and resources for using gamification and storyboarding tools effectively. Administrators can also coordinate ongoing professional development sessions and provide a supportive infrastructure to foster innovation in online teaching practices.

Limitations & Recommendations

While gamification and storyboards offer numerous benefits for student engagement and learning outcomes, there are limitations to their implementation. Not all students may positively respond to gamified elements, as some students may potentially find competitive aspects discouraging rather than motivating. Additionally, the effectiveness of these methods depends on the availability of technology and students' familiarity with digital tools, which could create accessibility challenges. Instructors may also require additional training to effectively integrate

gamification and storyboarding techniques into their curriculum. Furthermore, assessing student performance in non-traditional formats can be subjective, requiring clear rubrics and guidelines to ensure authentic assessment. To quantitatively measure the effectiveness and reception of these strategies, including targeted questions in student satisfaction or end-of-course surveys would be beneficial. These surveys can provide invaluable feedback for refining the implementation process and addressing potential challenges. Future research should also explore how these strategies impact different academic disciplines and student populations over time.

Conclusion

Incorporating gamification and storyboards into college classrooms represents a paradigm shift in higher education. By leveraging the principles of game design and visual storytelling, educators can create engaging, inclusive, and effective learning experiences. These tools not only appeal to various learning preferences but also empower students to think critically, collaborate effectively, and communicate creatively. As higher education continues to evolve, embracing flexible and innovative teaching practices will be essential to meet the needs of all students. By incorporating gamification and storyboards into students' thinking and writing processes, such assignments create a reflective and engaging learning experience.

For administrators overseeing online programs, these approaches offer scalable solutions to enhance student participation, improve learning outcomes, and support diverse learning preferences within virtual classrooms. By integrating these strategies into distance learning platforms, institutions can create more dynamic, student-centered educational experiences that align with the needs of remote learners.

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The Power of Choice:
How Ranking and Comparison Drive Student Learning

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Abstract

The Issue with Conventional Measurement

Most educational environments teach pupils to recognize single "correct" replies among obviously incorrect choices. In professional settings, however, there is rarely one clear answer to address difficulties. Multiple-choice assessments, true/false questions, and fill-in-the-blank exercises have become increasingly common, creating graduates who excel in identifying correct answers but struggle with complex scenarios that require careful evaluation (Adams, 2015; Zaidi et al., 2018). These conventional approaches prioritize memory over comprehension, quickness over careful analysis, and binary thinking over sophisticated judgment.

Over the past century, assessment techniques have undergone a significant evolution. We have transitioned from oral tests that emphasized recollection to standardized written tests as institutions sought a quick evaluation of the increasing student population. The mid-century saw the arrival of multiple-choice tests, which brought scalability but limited depth of inquiry. However, reflecting a growing awareness that these conventional methods were insufficient to measure the complex skills demanded by modern workplaces, recent decades have witnessed a paradigm shift towards more authentic assessment approaches. These include portfolios, project-based assessments, and competency demonstrations, marking a significant progression in the field of education (Govaerts & van der Vleuten, 2013).

Evaluating Ranking: Another Method

Ranking assessments offer a fresh perspective on traditional assessment methods by allowing students to rank multiple reasonable responses, identifying the most robust answer rather than determining a single correct one. This approach utilizes scenario-based challenges that reflect real-world complexity to engage students in evaluating solutions based on their relative value in specific situations. Unlike conventional assessments that encourage dichotomous thinking, ranking exercises force students to examine data, apply criteria, and defend their ideas. The salient features of ranking evaluations consist of needing a comparison rather than a pure assessment, presenting several good answers among distractions instead of one correct one, and emphasizing sensible prioritizing grounded on certain standards, Jonassens & Cho, 2018.

In ranking assessments, the inquiry moves from "Which answer is correct?" to "Which approach is most appropriate given these circumstances?" (Wiggins & McTighe, 2005). This change helps to match evaluation techniques with the demanding decision-making criteria of professional settings.

Advantages of Ranking Evaluation Growing in Critical Thinking Skills

In our information-rich environment, critical thinking—the ability to objectively analyze data, evaluate evidence, identify assumptions and draw reasonable conclusions has become increasingly important (Facione, 2015). The ranking assessment provides a robust framework for refining this ability, thereby significantly enhancing students' critical thinking skills and preparing them for the complexities of the real world.

Students engage in sophisticated comparison analysis instead of straightforward binary right/wrong answers when they have to distinguish between choices that all include aspects of truth. This strategy reflects actual decision-making

in which it is imperative to identify the best solutions among several options (King & Kitchener, 2004). Higher degrees of Bloom's Taxonomy (analyzing, assessing, and constructing) drive ranking activities, so students must assess relative value and build hierarchical frameworks. (Anderson & Krathwohl, 2001). Studies show the remarkable success of ranking assessments in improving critical thinking skills. Marzano and Kendall (2007) reveal that students who routinely interact with ranking assessments show a 27% increase in evaluative thinking compared to control groups using traditional multiple-choice questions, thereby improving their analytical skills. Similar advantages have been observed in various learning environments, ranging from medical education to high school history instruction. These results should inspire and motivate us to consider the benefits of ranking assessments in our teaching practices.

Improving Decision-Making Confidence

Critical thinking and decision-making are closely related; the former has a cognitive basis derived from the latter. Strong critical thinkers learn to assess challenging circumstances, examine facts objectively, and consider multiple perspectives—all essential skills for informed decision-making (Kahneman & Tversky, 2011). Ranking tests powerfully replicate real-world choice situations in which precise responses are rare. These tests capture the complexity of real-world decisions, where elements must be weighed, trade-offs assessed, and judgments supported by asking students to evaluate and prioritize several plausible possibilities (Jonassen, 2012). This approach prepares students for the uncertainty inherent in important decisions by bridging the gap between scholarly knowledge and practical application.

Regularly performing rating exercises improves judgment and increases confidence in decision-making. According to Bandura's self-efficacy theory, mastering events involving demanding cognitive tasks builds confidence that extends to other settings (Bandura, 2001). Under ambiguity, systematic comparison and evaluation make students feel more at ease in making challenging judgments (Nilson, 2016). These improved decision-making skills can be easily applied outside the classroom. Research tracking graduates from programs that emphasize rating evaluation reveals the applicability of these skills across various situations, from personal financial planning to corporate ethical dilemmas (Facione & Gittens, 2016). With companies routinely rating decision-making as one of the most important skills (World Economic Forum, 2020), the capacity to analyze alternatives methodically becomes an internalized technique that facilitates deliberate decision-making in every scenario.

Giving Instant Comment

Timely feedback is vital for knowledge acquisition and skill development in effective learning environments. The meta-analysis by Hattie and Timperley (2007) revealed impact sizes ranging from 0.73 to 1.13 when feedback is provided promptly and constructively, indicating that feedback timing is one of the strongest determinants of learning achievement. One of the key elements of effective learning environments is timely feedback. The meta-analysis by Hattie and Timperley (2007) demonstrated that feedback provided promptly and constructively can have a significant impact on learning achievement. Ranking tests excel in this aspect. When students evaluate several options, the quick comparison of their rankings with expert models or evidence-based hierarchies can cause cognitive discomfort, particularly when misalignments occur. This fast feedback loop accelerates the remedial procedure, which is often overlooked by conventional delayed assessment feedback.

Feedback's cognitive processing varies significantly depending on the test—whether it is ranking or traditional. Although conventional tests typically provide binary correct/incorrect answers, ranking tests require students to process degrees of correctness—a more complex type of feedback necessary for expert-level development. This progressive feedback strategy promotes deeper metacognitive processes as students must rethink erroneous rankings and the relative positioning of all options.

Instant feedback methods prevent the spread of misunderstandings, often resulting from erroneous knowledge that has been left unquestioned for long timeframes. Studies reveal that the rapid correction of erroneous rankings helps prevent the aggregation of misleading mental models, which become increasingly challenging to modify over time.

Building Low-Pressure Learning Spaces

High-stakes assessment environments can undermine the learning they want to measure, producing negative psychological conditions for acquiring knowledge and developing skills. Studies have shown that high exam pressure is correlated with lower intrinsic motivation, the use of surface-level learning techniques, and test anxiety (Amrein & Berliner, 2002).

Ranking assessment strategies offer a welcome relief from high-stakes assessment environments. By focusing on evaluative reasoning instead of binary right or wrong judgments, these strategies significantly reduce students' self-reported anxiety levels by 34% (Boud & Falchikov, 2007). This decrease is partly due to the acceptance of the underlying complexity of knowledge by ranking assessments, which values the cognitive effort of comparison analysis rather than penalizing poor memory. This emphasis on evaluative reasoning fosters a low-pressure learning environment that is conducive to knowledge acquisition and skill development. Ranked assessments provide psychological safety, promoting intellectual risk-taking and fostering deeper engagement with knowledge. They are positioned as learning aids rather than evaluating tools (Black & William, 2009). They help alleviate performance pressure by providing room for introspection and strategic change. Often lacking in high-stress testing, this reflecting process is crucial for acquiring adaptive knowledge and transferable abilities (Zimmerman, 2002).

Implementation Difficulties and Suggestions

Including ranking assessments in current courses requires careful application rather than simply adding them to existing practices. First, teachers should identify intended critical thinking goals using Wiggins and McTighe's (2005) backward design methodology. Then, teachers should plan rating activities aiming at these particular competencies. Typically beginning with limited-scope applications in specific course units, successful solutions gradually expand to more comprehensive curricular integration.

Technology platforms have greatly improved the feasibility of ranking evaluations. These days, modern learning management systems offer advanced question forms with automatic scoring capabilities. Research indicates that systems providing instantaneous visual feedback on ranking judgments yield notable improvements in subsequent assessment performance, making specialized assessment technologies more robust options for challenging ranking scenarios.

Designing effective ranking jobs requires in-depth knowledge in generating realistic possibilities with significant discriminations, even with technical support. Common design flaws include inadequate variation between options and grading systems incompatible with learning goals (Jonassen & Cho, 2008; Popham, 2011). Effective implementation depends on faculty development; studies show that teachers need 8–12 hours of focused training on the ranking approach to achieve consistent quality in assessment design (Condon et al., 2016).

Another difficulty for adoption comes from initial opposition from teachers and students. Although studies demonstrate that this resistance usually reduces dramatically after numerous exposures, students accustomed to binary right/wrong paradigms may find the ambiguity in ranking activities exceedingly difficult. Faculty concerns typically revolve around workload challenges and doubts regarding educational benefits, thereby underscoring the need to demonstrate significant improvements in student learning outcomes (Angelo & Cross, 2012).

Conclusion

The data presented show that ranking evaluation is a very effective teaching method with general advantages. Among these advantages is the development of critical thinking, as rating activities stimulate higher-order cognitive processes linked to the top levels of Bloom's Taxonomy. These tests create cognitive structures that directly enhance real-world decision-making capacity.

Ranking assessments have pedagogical usefulness partly due to their immediate feedback systems (Hattie & Timperley, 2007) and their development of low-pressure learning environments that reduce unproductive anxiety while maintaining accountability (Dweck, 2006). Such well-balanced evaluation environments support both psychological well-being and success.

As technology continues to enable increasingly advanced assessment methods, educational evaluation appears destined to evolve toward more complex models that reflect the nuanced thinking and decision-making required in modern society. Ranking assessments could be at the forefront of a broader movement away from simplified testing paradigms toward a more comprehensive evaluation of the cognitive capacities most valued in today's environment.

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Leveraging ChatGPT for Personalized Learning: Innovations and Challenges in Higher Education Pedagogy

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Abstract

This article explores the innovative integration of generative artificial intelligence (AI), specifically ChatGPT 4.0, into higher education courses focusing on business statistics. Conducted in Fall 2024, this pedagogical project aimed to enhance student engagement, deepen content understanding, and foster workplace preparedness. The project utilized a structured four-phase approach with an orientation to generative AI, practice and skill-building, an extensive team-based project requiring content mastery and generative AI application, and reflective practices. Student experiences were assessed through pre- and post-implementation surveys, revealing substantial increases in self-reported generative AI proficiency as well as positive impacts to various learning outcomes. Additional benefits included improved analytical skills, desire for additional generative AI integrated courses, reduced student anxiety, and increased confidence in career readiness. Taken together, this seemed to indicate the methodology utilized had a positive impact and could be applicable across various disciplines.

Overview

The integration of generative artificial intelligence (AI) into higher education courses has emerged as a powerful new method for enhancing pedagogical outcomes such as improved student engagement, deeper understanding of course content, and enhanced workplace preparedness (Chan & Hu, 2023; Kasneci et al., 2023; Lin & Ye, 2023). Further, there have been clear signals from employers that they desire students to now graduate not only with disciplinary knowledge, but also with advanced skills in utilizing generative AIs within the context of their disciplines (Gurchiek, K, 2024). This article examines a pioneering project conducted in Fall 2024 within courses MGT 2250 and MGT 2255, which explored the potential of high-level usage of ChatGPT as an instructional tool alongside traditional statistical analysis software such as Microsoft Excel. Though the pedagogical methods used were for courses on management statistics, the application and structure of the assignments utilized are not specific only to business or statistics and could easily be adapted to other courses and disciplines.

Purpose and Goals

This innovative pedagogical project aimed to bridge cutting-edge AI tools and traditional statistical methods, reinforcing their complementary strengths in economic and management analyses. Key goals included:

- Enhancing technical expertise among students.
- Developing effective data communication skills.
- Encouraging exploration of emerging AI technologies.
- Preparing students for modern technology-driven workplaces.

A secondary goal was to develop a new pedagogical strategy for introducing and integrating generative AI into course assignments in such a way that they would reinforce student learning instead of reducing or replacing learning experiences, provide students with hands on practice ethically utilizing generative AI, and leverage generative AI to increase student mastery of course goals by requiring higher levels of understanding beyond what generative AI could do on its own.

Methodology: Integration of ChatGPT-4.0 into Curriculum

Though many different AI models exist and could be leveraged for this pedagogical method, this project focused on using ChatGPT 4.0 Plus due in part to its prevalence in the business market space making it the most likely tool that future employers would like to see graduates have experience with and in part due to its capabilities to allow for Excel file uploads. Another critical feature of ChatGPT that was leveraged in this course was its ability to let users create and train their own custom Generative Pre-trained Transformers (GPTs). Similar to chatbots, GPTs are customizable generative AIs built on top of the ChatGPT's large language model for specific tasks. This feature would be used to allow students to combine instructions, knowledge, and capabilities to essentially create their own personalized AI assistant with little or no prior coding experience necessary (OpenAI, 2003). This feature was considered vital as learning to create their own custom GPTs is seen as part of an emerging skill set and providing students with experience in designing domain-specific AI assistants is becoming increasingly valuable in data-driven industries (Long & Magerko, 2020; Ng et al., 2021; Southworth et al., 2023). For business students especially, this competency supports the development of applied analytics solutions that are tailored, efficient, and scalable and the task of training a custom GPT involves skills that achieve the highest level of blooms taxonomy making for a good final project to measure students' mastery of both generative AI and the course materials.

Having chosen a generative AI that would fit the needs of the course, the next step was to work it into the curricula. The general methodology of integrating generative AI, ChatGPT in this case, into the course followed four key phases:

- Introduction/Orientation to the chosen generative AI platform.
- Practice and skill building through means such as group exploration, course work, class activities, and homework.
- Course project/assignment requiring mastery level knowledge of course subject(s) and advanced skills related to working with generative AI.
- And finally, a reflection of the student's experiences working with generative AI to complete assignments.

The first phase, introduction of the tool, involved an initial orientation session in which students were provided access to their own ChatGPT Plus subscription thanks to provost teaching and learning grant. The orientation session introduced students to ChatGPT 4.0 as an LLM model, covering its various features needed for the course project and guidelines for effective and ethical use in learning, problem-solving, and project work. This phase was vital to not only measure students' prior knowledge and comfort with using generative AI, but also to establish clear guidelines on how the course instructor views appropriate usage of generative AI within the confines of their course to ensure students maintain ethical usage.

The second phase, practice and skill building, took place over multiple weeks as it was interwoven into various course components. ChatGPT 4.0 was then incorporated in some fashion into most class meetings to enhance course engagement and ease students into becoming familiar with the platform. ChatGPT 4.0 was utilized first by the course instructor to demonstrate effective and ethical usage. Then, ChatGPT 4.0 was encouraged or, in some cases, required for usage in weekly homework, various assignments such as essays, and additional class activities; doing so helped to promote its use alongside Excel to explore synergies between generative AI and conventional tools. While usage of generative AI was integrated throughout the course, there were key areas in which students were not permitted to use it, such as during the three proctored midterms and final exam.

The third phase in the process involved a large course project that might be seen as the equivalent of a research assignment, term paper, or other type of assessment that is weighted heavily, spans multiple weeks in its' creation and implementation, and is used to assess the achievement of course objectives. The goals of this project are focused on having students express mastery knowledge of their core topic(s) or course subject(s), demonstrate their understanding of and skills in working with generative AI, and form new knowledge around best application of generative AI within their specific subject matter. In this case, the assignment was a team-based project in which students completed the following three steps:

- Step 1: Prompt Development
  Students received a well-defined problem that involved a scenario of a business challenge requiring

quantitative analysis. Students were instructed to craft a clear prompt for ChatGPT to understand the problem and prepare for the case study solution.

- Step 2: Case Study Using a Team Created GPT and Excel
  Students were randomly divided into teams of 8-9 (due to the large size of the class) and each were assigned a unique read-world business case that would require an analysis involving a quantitative statistical method taught during the course. For this project, teams would develop their own personalized GPT to analyze and produce solutions for their business case that they would use to generate insights, suggestions, and alternatives. They were also instructed to utilize Excel to complete quantitative analysis, applying traditional formulas, statistical methods, and data modeling. Further, the teams would compare the differences between using their GPT and using Excel with a focus on the accuracy, efficiency, and quality of the case solution and methods used in both platforms. In addition to developing a custom GPT, students created an AI-generated video demonstrating the practical application of their GPT within the context of their business case.

The third and final step of this project integrated the final phase of this pedagogical methodology; a reflection of the student's experiences working with generative AI to complete assignments. This phase helps students to unpack how they worked alongside generative AI to complete an assignment. Reflections should include information such as the role that generative AI played in assignment completion, what aspects of the assignment were completed by the student either directly or through transformation of generative AI output, a comparison of which elements were best completed by generative AI versus those that require or are best completed by a human element, and should encompass any additional information that would allow the instructor to assess the worked completed by the student alone and the ways they collaborated with generative AI to complete the other aspects of the assignment:

- Step 3: Presentation
  In this final step, teams created and gave a presentation outlining their business case, goals, methods, solutions, various statistical elements and graphs related to their analysis, and experience working with generative AI. This included the approaches taken to create, improve, and work with their GPT, a comparison of using their GPT and performing the same analysis themselves with Excel, and at least five ways that the GPT they created could be valuable for business applications in quantitative analysis, management, and statistics.

The project aimed for students to compare the effectiveness of Generative AI against traditional business tools in solving complex challenges. Through this project, students gained expertise in AI prompt engineering, quantitative analysis, and solution development while refining their teamwork and project management skills. The project provided valuable insights into the strengths, limitations, and real-world applications of generative AI technologies in business.

Survey Results and Student Feedback

As this was a new pedagogical methodology, both pre- and post-implementation surveys were conducted to gain insight into the student experience with an aim at refining and improving methodologies to fit with student needs and perceptions. The anonymous pre-survey, with 232 participants, was aimed at understanding what, if any, previous experience with generative AI students had. While 99% of respondents claimed they currently used Generative AI, their usages tended toward common practices such as creating tutorials for learning (55% reported), using it to write emails (53% reported), and coding assistance (52%). Further, a self-rating of generative AI knowledge on a 5-point scale from no knowledge (1), basic (2), intermediate (3), advanced (4) and expert knowledge (5). showed the majority (55%) felt they fell in the middle with intermediate knowledge, 5% claimed they had no knowledge, 33% rated their knowledge as basic, 8% rated their knowledge as advanced, and only 2% claimed expert knowledge.

This question was repeated in the anonymous post-survey to measure the impact the course methodologies had on students. According to the post survey, with 205 participants, there was a marked increase across respondents self-reported generated AI knowledge. While the majority (52%) still rated themselves as having intermediate knowledge, advanced knowledge jumped from 8% in the pre-survey to 40% in the post-survey. No knowledge (1%)

and basic knowledge (6%) both decreased while those claiming expert knowledge (2%) stayed the same. This upward shift in self-rated knowledge was impressive and served as initial evidence that the methods utilized in this course had a positive impact on student perceptions of their proficiency and confidence in relation to generative AI.

Further post-survey questions showed other areas of positive impact including 57% signifying a desire for their degree programs to offer more courses that integrate generative AI and 77% indicating they felt the inclusion of generative AI in their course had a positive impact on their experience. Further, 80% agreed or strongly agreed that generative AI was beneficial for completing homework, 78% agreed or strongly agreed that it was helpful for preparing for exams, 73% agreed or strongly agreed that it helpful in learning the course materials, and 61% agreed or strongly agreed that it increased their interest in the business discipline.

Survey feedback also demonstrated additional benefits as a result of generative AI integration, including 52% who indicated that using ChatGPT in this course helped lower their anxiety and, notably, 94% felt better prepared for internships and careers due to increased proficiency in AI technologies. These findings were further supported by answers to open response questions which stated impacts such as enhanced analytical skills, deeper understanding of quantitative methods, feelings that this experience will give them a competitive edge in the job market, and improved critical evaluation of AI-generated outputs.

Conclusion and Future Directions

At the end of the semester, after students had submitted and presented on their final project, the course instructor felt that the pedagogical methods developed for this course were successful from their perspective. The instructor felt that the goals they set of enhancing student technical expertise, developing students' data communication skills, encouraging students to explore and use AI technologies and preparing students for modern technology-driven workplaces were achieved. This is well supported by the results of the pre- and post-survey which clearly indicated that students felt integration of generative AI had a positive impact on their learning, provided them with increased confidence and knowledge related to using generative AI, and made them feel more prepared for their internships and future careers. By effectively combining ChatGPT with traditional statistical tools like Excel, students developed analytical skills and technological proficiency essential for contemporary workplaces.

While the goals specific to the course were clearly met, the tangible results of this project are not all course or discipline specific. Many areas such as career readiness, feelings of lowered anxiety, and proficiency using generative AI area all areas that translate to positive impacts across various disciplines. While this article details how this course specifically utilized this methodology to integrate generative AI, it could provide a valuable template for educators seeking to replicate this innovative and effective teaching methodology for leveraging generative AI. The four core phases of instruction for this method; orientation, skill building or scaffolding, mastery assignment completion, and reflection are all key components that all have years of educational research supporting their individual usage in most teaching environments. Taken in this sequence and adapted in a similar fashion, it is very likely other courses and disciplines would find a similar positive impact.

Additional research will focus on replicating this pedagogical practice in additional courses both inside and outside the business discipline as well as at other institutions. Additional research will also reveal possible changes to impacts due to different compositions of students; for example, in this project students entered with 99% having already used generative AI and only 5% claiming to have no knowledge proficiency and the majority feeling they had intermediate knowledge. While there was a clear increase in self-rated knowledge as indicated in the post-survey, gains could be even more dramatic in a course where students entered with less knowledge proficiency or, the opposite, we could find that students with less knowledge need even more orientation and practice (phase 1 and 2) than were provided here to achieve similar impacts. This type of research will be vital for refining and expanding these methods.

Another aspect that deserves more research is the possible impact integration of AI poses to various instructional challenges, particularly concerning academic integrity. This course addressed this by having proctored exams without AI assistance and working closely with students during orientation and practice, so they understand the boundaries of ethical AI usage. Further, reflection (phase 4) is useful to help determine where students may have strayed into unethical territory. More exploration into specific examples of integrity concerns may help provide more nuanced insights for future implementations.

While more research is needed to evaluate the effectiveness of this methodology across disciplines and the differences in impacts for students of varying pre-knowledge levels, it is clear that this methodology is headed in the right direction. The feedback from students both on the survey questions and those who provided responses to open-ended questions makes it evident that students felt this was an overall positive experience that aided their understanding not only of the course learning objectives, but also of generative AI and how they can work with it within the context of their discipline and eventually within their own careers. Helping students to achieve this new skill set, particularly as it relates to their chosen degree field, is ultimately the objective that this methodology hopes to provide to students of all disciplines, but, for now, it undoubtedly has had a beneficial impact for those students in management statistics.

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