SCIENTIFIC CULTURE

www.sci-cult.com

SCIENTIFIC CULTURE, Vol. 12, No. 1.1, (2026), pp. 465-483
Open Access. Online & Print

DOI: 10.5281/zenodo.11425142

EVALUATING THE EFFECTIVENESS OF TECHNOLOGY-DRIVEN INNOVATIVE ASSESSMENT METHODS ON STUDENT LEARNING OUTCOMES IN ACCOUNTING AND FINANCE EDUCATION

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Received: 11/11/2025
Accepted: 18/12/2025

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ABSTRACT

This study examines the impact of innovative technology-based assessments, podcasts and simulations on student learning and engagement. In accounting and finance education, professional bodies like ACCA, ICAEW, CFA emphasize more on traditional time pressured exams, which neglects the in-demand skills like critical thinking, technology adaptation and problem solving. Guided by a robust framework that integrates the ECM, TTF, and Activity Theory, the experimental research utilizes census data from 62 accounting and finance undergraduates across two universities. Findings from PLS-SEM emphasize that perceived usefulness, expectation confirmation, and a multidimensional task-technology fit significantly enhance student satisfaction and the intention to continue using these technologies. Prior digital experience strengthens these relationships, highlighting socio-technical readiness. Qualitative analysis using NVivo 14 emphasizes the importance of student agency, digital collaboration, and clear guidance, while identifying challenges related to digital access and assignment clarity. These findings collectively indicate that effective digital assessments require not only technological alignment but also comprehensive support and thoughtful pedagogical design. The study provides recommendations for integrating innovative assessments into courses, aligning with Education 4.0 and evolving professional standards.

KEYWORDS: Digital Pedagogy, Accounting and Finance Education, Student Satisfaction, Continuance Intention, Socio-Technical System, Education 4.0.

1. INTRODUCTION

The ongoing digital transformation in higher education, accelerated by advances in artificial intelligence (AI) and the principles of Education 4.0, has fundamentally altered the pedagogical landscape, compelling academic institutions to reconsider conventional teaching and assessment methodologies (Mukul & Buyukozkan, 2023; Christine, 2017). In the accounting and finance disciplines, however, the professional qualification exams, such as those offered by Chartered Financial Analyst (CFA), Association of Chartered Certified Accountants (ACCA) and others, predominantly continue to rely on traditional numerical, closed-book and time-strained assessments. While these methods effectively measure computational accuracy and theoretical recall, they inadequately capture higher-order cognitive competencies such as critical thinking, ethical decision-making and adaptive problem-solving, all of which are increasingly emphasized in employer expectations and industry 4.0 standards (Carvalho & Almeida, 2022; Nkhoma et al., 2018). Although some professional bodies have begun integrating case-based assessments (ACCA, 2023) or applied skill-based course completions (CFA Institute, 2023), their capacity to respond to the rapidly evolving educational landscape particularly in light of AI powered automation of routine tasks remains constrained and under researched (Apostolou et al, 2021).

Further, universities are increasingly urged to adopt assessment strategies that not only measure the knowledge acquisition but also foster skills essential for professional judgement and lifelong learning. Howieson (2003) highlighted the importance of moving beyond technical proficiency to develop analytical and ethical reasoning in accounting graduates. Apostolou et al., (2021) in their comprehensive review of accounting education literature, emphasized the necessity of aligning assessments with real-world competencies and integrating pedagogical tools that support high-order learning.

Previous research from disciplines such as medical education (Cho et al., 2017), engineering education (Wakefield et al., 2022) and business education (Riley et al., 2013; Vos, 2015) has demonstrated that podcasts and simulations can significantly enhance student engagement, deepen learning experiences and facilitate the practical application of theoretical knowledge. For instance: in medical education, podcasts have shown to improve information retention and student satisfaction (Cho et al., 2017). In engineering, Wakefield et al., (2022) find that simulations support the development of systems thinking and problem-solving capabilities. In broader business education, podcast assessments foster student creativity and communication skills (Riley et al., 2013) while simulations promote experiential learning (Vos, 2015). However, their adoption and empirical evaluation in accounting and finance education remain limited. The few studies that have emerged tend to focus on instructional rather them assessment-oriented use, thereby missing the opportunity to validate these tools as graded mechanisms that support discipline-specific learning objectives (De Lange et al., 2003 and Alon-Barkat & Busuioc, 2022).

Moreover, successful integration of these innovative assessments involves complex socio-technical considerations, such as digital readiness among students, ethical implications of AI technologies and the dynamic interactions between learners, instructors, and technological platforms (Bearman & Ajjawi, 2023). These socio-technical dimensions critically influence the acceptance, effectiveness and long-term sustainability of innovative educational practices, underscoring the importance of exploring these factors explicitly within accounting and finance contexts. Based on the Activity theory (Engestrom, 1987) emphasizing the mediated nature of learning activities through different tools and community, making them relevant for evaluating the integration of podcasts and simulations in digitally mediated assessments.

To address this research gap, the study investigates the implementation of podcasts and simulation-based assessments as formal, graded assessment tools at De Montfort University Dubai and Rochester Institute of Technology Dubai, **seeking answers to the following research questions**

1. How effective are podcasts and business simulations in improving students' learning outcomes in accounting and finance education, and what is the perception of students towards these methods?
2. How do students feel about the adoption and utilization of assessment methods, such as podcasts and business simulations in accounting and finance education, and what are their satisfaction levels towards them?

The present study applies an integrated framework combining the Expectation–Confirmation Model (ECM) (Bhattacherjee, 2021) and the Task-Technology Fit (TTF) model (Goodhue & Thompson, 1995), operationalized through a dual institutional experimental design with two courses at

De Montfort University (DMU) Dubai and Rochester Institute of Technology (RIT) Dubai. ECM offers a lens to evaluate students' expectation and continuance intention by examining the alignment between their expectations and post-adoption experiences with podcast and simulation assessments. TTF, meanwhile, provides the analytical structure to determine whether these tools effectively support the learning tasks required in accounting and finance, where the real-world reasoning and critical thinking are central. The integration of ECM and TTF is particularly well-suited for this experimental context, as it captures both subjective learning experience (via confirmation and satisfaction) and the objective task- alignment of the technologies used.

The integrated framework further draws on Activity Theory (Engeström, 1987) to conceptualize how learning outcomes are mediated through these digital tools in socially situated environments. By applying this multi-theoretical lens, the study not only evaluates the cognitive and functional aspects of technology-based assessments but also engages with broader systemic conditions such as ethical AI use, institutional digital readiness, and assessment authenticity, crucial to advancing Education 4.0 in professional disciplines like accounting and finance.

The findings show that when digital assessment tools align with learning outcomes and receive strong support from institutional infrastructure, they can significantly enhance student engagement, satisfaction, and willingness to continue using them. This research connects critical thinking, technical skills, and social context, providing useful ideas for updating assessments to meet the needs of Education 4.0 in the accounting and finance domain

This study makes three significant contributions to the literature on digital pedagogy and assessments in accounting and finance education. First, it is the first experimental study to empirically validate the integrated framework in the formal assessment context of accounting and finance education, a field dominated by numerical exams. Unlike prior studies that treat podcasts and simulations as instructional add-ons, we embed these tools as graded, curriculum-integrated interventions specially designed to cultivate professional judgement and critical thinking. Second, the study introduces a dual-deployment model spanning the Rochester Institute of Technology (RIT) Dubai and De Montfort University (DMU) Dubai, thereby showcasing a scalable and transferable experimental design that enhances external validity and real-world applicability in global higher education contexts. Third, the findings offer actionable insights for AI-resilient curriculum design, providing a pathway for educators and academic leaders to implement technology-based assessments that promote student agency, resist the use of generative AI shortcuts, and uphold disciplinary rigor in an era of digital disruption. Together, these contributions advance both the theoretical modeling and practical application of innovative assessment within Education 4.0, offering a strong pedagogical, methodological, and strategic rationale for institutional adoption, as well as a robust socio-technical perspective. This contributes significantly to the discourse on digital transformation and pedagogical innovation in higher education. The outcomes offer actionable recommendations for educators and institutions aiming to align assessment practices more effectively with contemporary industry standards and furture-oriented professional competencies demanded by the global finance and accounting profession.

The remaining paper is structured as follows: Section 2 reviews the literature and develops hypotheses. Section 3 outlines the research methodology; Section 4 presents the results; Section 5 discusses the key findings; Section 6 presents the implications and Section 7 concludes with limitations and direction for future research.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

This section examines the empirical evidence supporting the use of podcasts and simulations in education, along with the theoretical framework and the integrated conceptual model that supports the current study.

2.1. Application of Podcasts and Simulations in Education

Over the past decade, educational institutions have increasingly adopted digital tools such as podcasts, digital portfolios, and simulations to improve learning experiences. Podcasts, once confined to the realm of entertainment, are now being embraced across disciplines as tools for instructional delivery and student engagement. Their asynchronous, mobile-friendly ability allows students to engage with content beyond classroom (Hew 2009; Kay, 2012).

Previous studies offer valuable insights into the effectiveness of these approaches, highlighting their benefits and challenges in various educational contexts.

Hopkins (2012) explored the potential value of

student-created podcasts as assessment tools and argued that the process of creating podcasts requires students to research, script, and produce content, which deepens their engagement with the learning materials. The study highlights that podcasts provide an alternative to traditional written assignments, making assessment more inclusive and dynamic. The formative potential of podcasts allows for ongoing feedback and reflection, enabling students to improve their understanding and skills continuously.

Applying podcasts in the field of geomorphology, Kemp et al, (2011) demonstrates that creating podcasts helps students develop a range of skills such as research, scriptwriting, audio-editing, while improving their ability to communicate complex scientific concepts. Extending this practice to interdisciplinary education, Fantini (2024) found that when students create podcasts, interpreting complex content and engaging with materials, they develop communication competencies, reflexivity, and deeper critical understanding. The creative and reflective aspects of podcast production were shown to enhance higher-order thinking and articulation of knowledge in academic contexts (Fantini, 2024). The ability to reflect on their learning journey and receiving peer feedback enriches their educational experience, making podcasts a versatile tool for student learning and assessment.

Further, Wakefield, Pike and Amici-Dargan (2022) investigate the use of learner-generated podcasts in higher education, emphasizing that by working in pairs, learners engage in collaborative learning, enhancing their understanding on the subject matter through discussion and co-creation. In alignment with the previous studies, Nieminen and Ketonen (2023) established that reflective podcasts in teachers' education encourage self-assessment and peer feedback contributing to professional growth of the students. The study concluded that it is an effective tool for supporting the continuous development of student teachers, enhancing their ability to critically evaluate their teaching practices.

Parallel to the use of podcasts, business simulations have emerged as a powerful tool in student learning and assessment. Riley et al. (2013) explore the use business simulation as assessment tool, highlighting the ability to provide realistic and practical context for students to apply theoretical knowledge. The study found that students who participated in business simulations demonstrated higher levels of engagement and motivation, as they could see a direct relevance of their learning to practical scenarios. Vos (2015) further examines student learning from simulations and suggested that the method evaluates the application of knowledge and the effectiveness of strategies employed by the students during the simulation. This comprehensive approach to assessment ensures that simulations not only enhance learning but also provide valuable feedback for continuous improvement.

Building on this foundation, recent evidence shows that simulation can foster critical skills such as collaboration, problem-solving, and adaptability. Chen, She, and Tsai (2024) found that when students work in teams navigating complex, simulation-based challenges, they develop effective communication, negotiation, and conflict-management strategies. The immersive nature of these simulations enables them to experiment with strategies and observe outcomes directly, reinforcing learning through experience. This holistic learning approach prepares students effectively for the complexities of modern business contexts.

While a growing body of research has validated the role of digital tools in enhancing student learning outcomes across disciplines, accounting and finance education remains underrepresented in this transformation. Prior studies have focused primarily on the use of digital tools as instructional enhancements or using these tools to test basic knowledge in classroom via quizzes and Kahoot games or tracking student progress, but have not integrated technology into formal assessment approaches aligned with the complex skills needed for accounting and finance professions (Coovadia & Ackermann, 2020). Importantly, there is very little research that looks at how these innovative digital tools can be used as graded coursework supporting students in developing professional skills such as critical thinking and real-world decision-making.

2.2. *Theoretical Framework*

The present research, further, integrates three complementary theoretical frameworks: the Expectation–Confirmation Model (ECM), the Task-Technology Fit (TTF) Model, and Activity Theory as a socio-technical interpretive lens.

ECM: This model introduced by Bhattacherjee (2021), has been extensively applied to examine technology continuance intentions. ECM posits that users form initial expectations about a technology's performance and then evaluate those expectations against actual usage experience. This confirmation, or disconfirmation, of expectations directly influences perceived usefulness and satisfaction, which in turn shape the intention to continue using

the technology (Rabaa'i, Abu Alma'atti, & Zhu, 2021). In educational contexts, ECM has successfully explained student's satisfaction and continued usage intentions with digital learning tools, highlighting the pivotal role of expectation confirmation and perceived usefulness (Cheng, 2014).

TTF Model: The TTF model, introduced by Goodhue and Thompson (1995), posits that the effectiveness of technology use depends on how well the technology's functionalities align with the tasks the user is expected to perform. It further emphasizes the necessity of alignment between technological capabilities and user task requirements. In other words, the theory posits that individuals are more likely to use a technology effectively when there is a strong alignment between the task characteristics (e.g., complexity, structure) and the technology's capabilities (e.g., flexibility, interactivity, feedback mechanisms). In education, this theory has been widely adopted to examine how digital tools contribute to learning outcomes when there is a meaningful match between technology features and academic task requirements. In medical training, Al-Kadi & Rees, (2020) found that simulation software provides a strong task-technology alignment by mimicking real-life patient care scenarios. Similarly, in business education, Isaac et al., (2019) applied TTF to evaluate how learning management systems (LMS) and online collaborative tools fit the pedagogical objectives of case-based learning. Their findings indicated that a high degree of TTF positively influenced students' perceived learning performance and satisfaction, suggesting that when technological tools are well-aligned with the interactive and reflective nature of case-based learning, they enhance students' educational experiences and outcomes.

The Activity Theory: As developed by Engestrom (1987), this theory is a socio-technical framework used for analyzing human practices as developmental processes, with both individual and social levels dynamically interacting within six core elements. While the element 'Subject' indicates the individual or a group engaged in the activity, 'Object' indicates the target or the goal that motivates the activity, which in turn is transformed into outcomes through the activity. The next component of the theory is 'Tools' or the mediating artifacts, which involves the instruments, signs, or technologies used by the subject to act upon the object. 'Community' involving broader social group, 'rules' involving guidelines and regulations to operate with, and finally the 'division of labor' comprising the distribution of tasks and responsibilities amongst community members are the other core components of this theory. In the education settings, Barab et al., (2002) emphasized on the implementation of learning technologies that require alignment not just with tasks but also with the broader systemic elements, involving digital readiness, faculty support, and institutional culture.

The integration of ECM, TTF, and Activity theory provides a comprehensive lens to understand students ' engagement with technology-enhanced assessments in accounting and finance education. ECM captures the cognitive and affective dimensions of students' satisfaction and continuance intention, aligning with how students form and adjust expectations post-technology adoption (Bhattacherjee, 2001; Cheng 2014). TTF, on the other hand, emphasizes the practical alignment between the technological features and academic tasks in hand (Wu and Chen, 2017). These two models have been jointly applied in educational technology studies, offering synergic insights into perceived usefulness and satisfaction. However, prior literature often overlooked the broader socio-technical context in which students interact with the tools. By incorporating activity theory, this study introduces a systemic viewpoint that considers mediators such as prior experience, tools and subject. This theoretical framework intends to provide a rich multi-dimensional understanding of student interaction with innovative assessments, podcasts and simulation, bridging psychological expectations, technological alignment, and socio-contextual influences, making it relevant for the evolving Education 4.0 landscape for accounting and finance domain.

2.3. Integrated Conceptual Model and Hypotheses Development

Incorporating insights from the ECM and TTF models, our study seeks to understand the effectiveness and impact of technology-based assessments, such as podcasts and simulations, in accounting and finance education. Based on the key constructs of the dual theoretical framework and following the work of Wang et al. (2023), the present study proposes a research model focusing on the six hypotheses. Figure 1 visually represents the hypothesized relationships among the integrated constructs.

2.3.1. Confirmation Hypothesis and Perceived Usefulness (H1)

Within the ECM, confirmation is the immediate driver of perceived usefulness. In accounting and

finance education, when students' experiences with podcasts and simulations meet or exceed expectations, they are more likely to regard these assessment methods as useful for understanding and applying course material. This hypothesis aligns with studies conducted by Cheng (2014), which demonstrate that perceived usefulness is strongly correlated with expectations in education settings.

H1: There is no significant relationship between confirmation and perceived usefulness of these assessment methods in accounting and finance education.

2.3.2. Confirmation of Expectation Hypothesis (H2)

According to the ECM, user satisfaction is significantly influenced by the confirmation of expectations. When students' experiences with podcasts and simulations meet or exceed their expectations, their satisfaction levels increase. This hypothesis underscores the importance of managing and meeting students' expectations to ensure positive learning outcomes. Alshammari and Alshammari (2024) have shown that expectation confirmation is crucial for enhancing user satisfaction in educational contexts.

H2: Confirming students' initial expectations regarding podcasts and simulations does not positively influence their satisfaction.

2.3.3. Perceived Usefulness on Satisfaction Hypothesis (H3)

This hypothesis is built on the revised ECM model, which integrates perceived usefulness as a direct predictor of satisfaction. When students perceive podcasts and simulations as valuable tools that enhance their learning, their overall satisfaction with these assessment methods increases. Empirical evidence from the studies by Davis (1989) and Venkatesh & Davis (2000) supports the strong relationship between perceived usefulness and user satisfaction. In educational research, Cheng (2014) have confirmed this relationship in various learning environments.

H3: The perceived usefulness of podcasts and simulations does not directly affect students' overall satisfaction with these innovative assessment designs.

2.3.4. Continuance Intention Hypothesis (H4)

The ECM posits that user satisfaction is a primary determinant of continuance intention. Satisfied users are more likely to continue using technology in the future. Empirical studies by Cheng (2014) support this hypothesis, indicating that satisfaction drives usage intentions. In the context of the present study, students who are satisfied with podcasts and simulations are more likely to desire to continue using these tools in subsequent courses. Hence, we propose:

H4: Students satisfied with podcasts and simulations for assessments are not more likely to intend to keep using them.

2.3.5. Task-Technology Fit Hypothesis (H5)

The TTF model posits that technology is most effective when its functionalities align well with the tasks it is designed to support. In educational settings, as discussed earlier, TTF is conceptualized as a multi-dimensional construct comprising the fit between the learning task and technology (TTF–T), the functional adequacy of the technology (TTF–Tech) and the alignment between technology features and pedagogical objectives (TTF–ALIGN) (Issac et al., 2019). Wu and Chen (2017) demonstrate that a strong task-technology fit enhances perceived usefulness, making educational technologies more valuable to students. In other words, when students perceive that a digital assessment tool is well-matched to the specific cognitive and procedural demands of the learning coursework, they are more likely to be have a positive contribution on the users' perception of usefulness. In line with this, the current study suggests when podcasts and simulations are well-aligned with the learning outcomes and tasks of an accounting and finance course, students perceive these tools to be more useful. In this context, **we propose the hypotheses as**

H5a: TTF–T does not positively influence students' perceived usefulness of technology-based assessments.

H5b: TTF–Tech does not positively influence students' perceived usefulness of technology-based assessments.

H5c: TTF–ALIGN does not positively influence students' perceived usefulness of technology-based assessments.

2.3.6. Task-technology Fit on Continuous Intention Hypothesis

Beyond enhancing perceived usefulness, a strong task–technology fit also directly influences students' intention to continue using the technology. Wang et al. (2023) suggest that in case of the TTF model, when students perceive a high degree of fit between the technology and their learning tasks, they are more likely to continue using it. In line with the prior research, the current study conjectures that when

educational technologies such as podcasts and simulations demonstrate a high degree of fit with core academic tasks (TTF-T), provides robust technical support for learning activities (TTF–Tech), and align well with learning outcomes (TTF-ALIGN), then students are more likely to develop a positive intention to continue using these platforms. Though prior research shows a direct influence of TTF on continuance intention but the present study offers to test the indirect influence mediated through perceived usefulness and satisfaction constructs on continuance intention. In this context, **we propose the hypotheses as**

H6a: TTF-T does not positively influence student's intention to continue using these innovative technology assessment tools.

H6b: TTF-Tech does not positively influence student's intention to continue using these innovative technology assessment tools.

H6c: TTF-ALIGN does not positively influence student's intention to continue using these innovative technology assessment tools.

2.3.7. The Moderating Role of Prior Experience (H7)

While the main constructs of the ECM and TTF models are central to understanding the adoption of innovative digital assessment tools, prior literature highlights the crucial role of individual user characteristics in shaping technology acceptance and continuance (Venkatesh et al., 2003). Experienced students are generally more comfortable navigating digital platforms and are more likely to translate positive satisfaction with current tools into intentions to persist in their use. Conversely, students with limited prior experience may require additional support; for them, satisfaction alone may not be sufficient to drive continuance (Rekha, Shetty, & Basri, 2023). In digital education, the moderating effect of students' prior digital experience is particularly salient as learners bring increasingly heterogeneous digital backgrounds to assessment contexts (Cazan, Cocorada, & Maican, 2020). Additionally, prior experience significantly moderates how students perceive the alignment between tasks and technology, affecting perceived usefulness and satisfaction (Li, Cao, & Xie, 2022). In line with previous literature, we define the variable Prior Experience (PREXP) as students' previous exposure to podcasts and simulations. Building on these insights, **we propose the hypothesis as**

H7a: Prior experience of students with podcast strengthens positive relationship between satisfaction and their intention to continue using such digital tools for learning.

H7b: Prior experience of students with simulation strengthens positive relationship between satisfaction and their intention to continue using such digital tools for learning.

Figure 1 below presents the conceptual model used in the study.

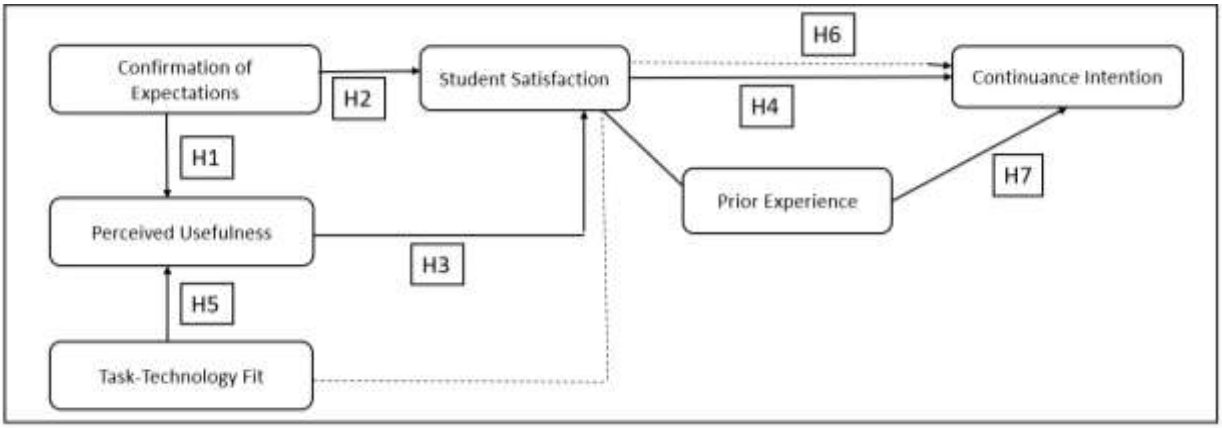

Figure 1: Conceptual Model and Hypothesis Development.

3. RESEARCH METHODOLOGY

3.1. Questionnaire Design

The survey questionnaire instrument in this study is constructed to provide both quantitative and qualitative data on students' experiences with technology-based assessments in accounting and finance education. All quantitative items are mapped to the conceptual framework comprising ECM, TTF and Activity Theory and are measured using a Likert scale (1 = Strongly Disagree and 5 = Strongly Agree) consistent with the established practices in educational and behavioural research (Chin 1998; Hair et al., 2017). Constructs such as Perceived Usefulness (PU), Confirmation of Expectations

(CONF), Satisfaction (SAT), Continuance Intention (CI), TTF–Task Characteristics (TTF–T), TTF–Technology Characteristics (TTF–Tech), and TTF–Task–Technology Alignment (TTF–TTA) and Prior Experience (PREXP), are measured with multi-scale items adapted from widely used and validated instruments (Bhattacherjee, 2001; Venkatesh & Davis, 2000). The data collected via survey questionnaire is subsequently analyzed using Structured Equation Modeling (SEM) in Python Labs.

Qualitative, open-ended items in the survey are included to allow richer exploration of students' perspectives and socio-technical experiences, particularly regarding their use of AI tools, a key consideration in Education 4.0 (Bearman & Ajjawi, 2023). These qualitative questions are intentionally designed to enable the interpretative application of Activity theory. The responses to these qualitative items in the survey are analyzed thematically, focusing on the core components of the Activity Theory - subject (student), object (learning goal), mediating artifact (podcast, simulation, AI tools), community (class, peers, institution), rules (assessment guidelines, academic integrity), and division of labor (roles of students, instructors, technology).

The responses were exported and organized for systematic analysis. NVivo 14 is employed for qualitative data analysis, facilitating thorough coding, pattern recognition, and thematic development. Two researchers independently coded the responses. The initial phase of open coding identified core concepts and experiences, which were subsequently grouped into higher-order themes through iterative comparison and discussion. This method ensured that emerging patterns were firmly grounded in the data and validated for consistency and credibility. In addition, negative cases and diverse perspectives were preserved to mitigate any potential thematic bias.

All questionnaire items and their corresponding assignments to constructs are detailed in Table 1a and 1b below.

Table 1a: List of Questionnaire Items with Constructs and Analysis Code.

Construct	**Survey Item**	Analysis Code
Perceived Usefulness (ECM)	Podcasts/simulations improved my understanding of accounting and finance concepts.	PU1
	Made it easier to apply theory to real-world scenarios.	PU2
	Helped me prepare for assessments.	PU3
	Enhanced my overall learning experience.	PU4
Confirmation of Expectations (ECM)	My experience matched what I expected before using them.	CONF1
	Were as effective as I hoped for learning.	CONF2
	Expected benefits were realized.	CONF3
Satisfaction (ECM)	I am satisfied with podcasts/simulations as part of my assessment.	SAT1
	Found the experience enjoyable and worthwhile.	SAT2
	Pleased with the integration of these tools.	SAT3
Continuance Intention (ECM)	I would like to use podcasts/simulations in other courses.	CI1
	Likely to recommend to peers.	CI2
	Intend to use again for learning.	CI3
TTF–Task Characteristics	Assignments required analytical and critical thinking.	TTF-T1
	Tasks involved real-life scenarios.	TTF-T2
	Required collaboration/group work.	TTF-T3
TTF–Technology Characteristics	Provided features needed for course tasks.	TTF-Tech1
	Easy to use and accessible.	TTF-Tech2
	Supported collaboration.	TTF-Tech3
	Enabled communication/sharing of ideas.	TTF-Tech4
TTF–Task-Technology Alignment	Features well-matched to task requirements.	TTF-Align1
	Suitable for complexity of tasks.	TTF-Align2
	Good fit with assignment requirements.	TTF-Align3
Prior Experience (Moderator)	Have you created a podcast for any course prior to this assignment?	PREXP1
	Have you used a business simulation prior to this assignment?	PREXP2

Table 1b: List of Open-ended Qualitative Questions.

Questions	Qualitative Questions
Q1	What aspects of creating/participating in the podcast/simulation did you find most valuable?
Q2	What challenges, if any, did you face during the podcast/simulation assessment?
Q3	How did these assessments impact your learning and understanding of accounting/finance concepts?
Q4	Did you use any digital or Gen AI tools to assist you? If so, please describe.

3.2. Sampling Design and Size

This experimental study employs a census sampling method, involving the collection of data from every member of the target population (Israel, 1992).

All students enrolled in accounting and finance courses–Advanced Financial Reporting (employed Podcast as graded formative assessment) and Management Control & Development (employed Simulation as graded formative assessment) at DMU Dubai and Financial Management (employed Simulation as graded formative assessment) and Financing New Ventures (employed Podcast as graded formative assessment) at RIT Dubai. Students considered for the study undertook both courses at either university and completed both the graded assessments. A total of 75 students were included in the survey–40 students from DMU Dubai and 35 students from RIT Dubai.

The use of census sampling for this study is relevant for several reasons. First, the total number of eligible students was manageable, allowing for the practical administration of the survey to the entire student population of both universities involved in the experimental intervention.

Second, including all students who undertook both the podcast and simulation assessment tasks eliminates selection bias and maximizes the representativeness of the sample. This approach enhances the internal validity of the study by ensuring that findings reflect the full diversity of student experiences and responses within the intervention cohort (Israel, 1992; Creswell & Creswell, 2017). Thus, census sampling strengthens the current study's methodological rigor and supports more generalizable and trustworthy inferences about the impact of technology-based assessment innovation in the accounting and finance education.

The study invited all 75 students from the two participating universities to complete the survey. Responses from students who submitted incomplete data, as well as those who participated in pilot testing phase, were excluded from the final dataset. As a result, the final sample comprises a total of 62 responses, representing an 82.7% response rate and ensuring robust coverage of the target population. Given the census design, the traditional sample size determination methods (such as Cochran or G-Power analysis) are not used in the present study. However, the final sample size is also within the recommended guidelines for PLS-SEM and structural modeling (Hair et al., 2017; Reinartz et al., 2009), supporting the reliability of the analysis and findings.

3.3. Pretesting and Validation

To ensure clarity, reliability, and validity, the draft questionnaire underwent a rigorous pretesting phase.

Two domain experts–one from the accounting and finance domain and another with teaching and learning expertise- reviewed the survey instrument for content validity, ensuring alignment with theoretical constructs and appropriateness for the target student population.

The survey was then piloted with a sub-sample of 5 students (excluded from the main study) to identify ambiguous or confusing question items, leading to minor revisions in question wording and survey flow. The study used established scales for constructs from existing literature and modified to fit the study context (Liaw, 2008).

4. DATA ANALYSIS AND INTERPRETATION

4.1. Measurement Model Assessment

The measurement model analysis was executed using the Python programming language, employing libraries such as Pandas for data handling, NumPy for numerical computations, and SciPy for statistical tests.

The evaluation of the model was conducted based on several criteria: indicator reliability, internal consistency reliability, convergent validity, and discriminant validity, adhering to standard PLS-SEM procedures (Hair et al., 2019). The study utilized Partial Least Squares Structural Equation Modelling (PLS-SEM) to thoroughly assess the reliability of constructs, as well as their convergent and discriminant validity, thereby ensuring the quality and robustness of the scales utilized. Figure 2 presents the measurement model.

Indicator reliability was assessed by examining the outer loadings of individual measurement items. All item loadings surpassed the recommended threshold of 0.70 (Hair et al., 2022), indicating a

strong level of reliability. Specifically, the loadings ranged from 0.81 to 0.97 for constructs such as Perceived Usefulness (PU: 0.84-0.97), Confirmation (CONF: 0.93-0.97), Satisfaction (SAT: 0.92-0.94), and Continuance Intention (CI: 0.90-0.96).

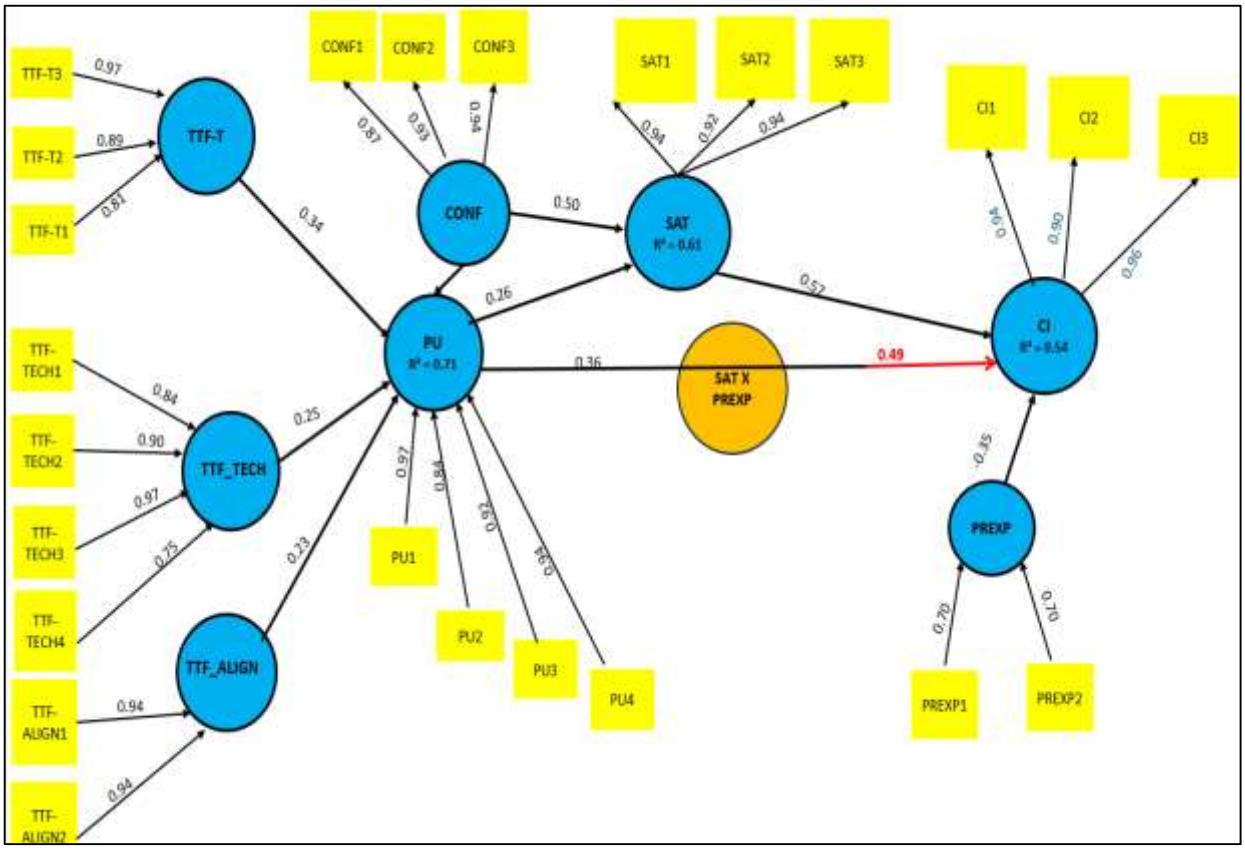

Figure 2: Measurement Model.

Additionally, the loadings for TTF dimensions, including Task Characteristics (0.81-0.89), Technology Characteristics (0.75-0.97), and Task-Technology Alignment (0.90-0.94), demonstrated a high reliability of indicators (refer to Table 2).

Internal consistency reliability was evaluated using Cronbach's Alpha.

The Cronbach's Alpha values ranged from 0.70 for Prior Experience to 0.93 for Confirmation, demonstrating strong internal consistency across all constructs. Likewise, the CR values varied from 0.82 for Prior Experience to 0.97 for Confirmation, surpassing the recommended threshold of 0.70, thus confirming excellent construct reliability (refer to Table 2).

Convergent validity was assessed through Average Variance Extracted (AVE), with all AVE values exceeding the minimum recommended level of 0.50 (Fornell & Larcker, 1981). The AVE values ranged from 0.65 for Prior Experience to 0.93 for Confirmation, affirming robust convergent validity (as illustrated in Table 2).

Table 3 presents the correlations among the constructs, all of which were below 0.85. This indicates that the constructs are distinct and do not excessively overlap, thereby supporting discriminant validity.

Additional validation of discriminant validity was conducted using the Fornell-Larcker criterion. This criterion, shown in Table 4, represents the square root of AVE (noted in bold along the diagonal). Importantly, the square root of AVE for each construct was greater than the inter-construct correlations, clearly distinguishing each construct from the others.

Overall, the thorough evaluation of the measurement model confirmed high indicator reliability, internal consistency, convergent validity, and discriminant validity across all constructs. These compelling findings suggest that the measured constructs are well-suited for subsequent structural model analysis, enabling reliable hypothesis testing and meaningful interpretation of relationships within the structural model.

Table 2: Measurement Model Assessment.

Construct	Item	Measurement Item	Outer Loading	Cronbach's Alpha	Composite Reliability	AVE
Perceived Usefulness	PU1	Podcasts/simulations improved my understanding of accounting and finance concepts.	0.97	0.92	0.96	0.91
	PU2	Made it easier to apply theory to real-world scenarios.	0.84			
	PU3	Helped me prepare for assessments.	0.92			
	PU4	Enhanced my overall learning experience.	0.94			
Confirmation	CONF1	My experience matched what I expected before using them.	0.97	0.93	0.97	0.93
	CONF2	Were as effective as I hoped for learning.	0.93			
	CONF3	Expected benefits were realized.	0.94			
Satisfaction	SAT1	I am satisfied with podcasts/simulations as part of my assessment.	0.94	0.92	0.96	0.91
	SAT2	Found the experience enjoyable and worthwhile.	0.92			
	SAT3	Pleased with the integration of these tools.	0.94			
Continuance Intention	CI1	I would like to use podcasts/simulations in other courses.	0.94	0.91	0.95	0.88
	CI2	Likely to recommend to peers.	0.90			
	CI3	Intend to use again for learning.	0.96			
TTF–Task Characteristics	TTF-T1	Assignments required analytical and critical thinking.	0.81	0.89	0.93	0.81
	TTF-T2	Tasks involved real-life scenarios.	0.89			
	TTF-T3	Required collaboration/group work.	0.87			
TTF–Technology Characteristics	TTF-TECH1	Provided features needed for course tasks.	0.84	0.91	0.94	0.80
	TTF-TECH2	Easy to use and accessible.	0.90			
	TTF-TECH3	Supported collaboration.	0.97			
	TTF-TECH4	Enabled communication/sharing of ideas.	0.75			
TTF–Task-Technology Alignment	TTF-ALIGN1	Features well-matched to task requirements.	0.94	0.89	0.94	0.89
	TTF-ALIGN2	Suitable for complexity of tasks.	0.94			
	TTF-ALIGN3	Good fit with assignment requirements.	0.90			
Prior Experience	PREXP1	Have you created a podcast for any course prior to this assignment?	0.70	0.70	0.82	0.65
	PREXP2	Have you used a business simulation prior to this assignment?	0.70			

Table 3: Correlation Matrix.

	SAT	PU	CONF	CI	TTF_TASK	TTF_TECH	TTF_ALIGN	PREXP
SAT	1	0.671	0.735	0.714	0.507	0.631	0.483	0.022
PU	0.671	1	0.641	0.582	0.705	0.725	0.624	0.092
CONF	0.735	0.641	1	0.754	0.387	0.705	0.498	0.019
CI	0.714	0.582	0.754	1	0.454	0.638	0.445	0.064
TTF_TASK	0.507	0.705	0.387	0.454	1	0.518	0.818	-0.068
TTF_TECH	0.631	0.725	0.705	0.638	0.518	1	0.606	0.112
TTF_ALIGN	0.483	0.624	0.498	0.445	0.818	0.606	1	-0.068
PREXP	0.022	0.092	0.019	0.064	-0.068	0.112	-0.068	1

Table 4: Fornell and Larcker Criterion.

	SAT	PU	CONF	CI	TTF_TASK	TTF_TECH	TTF_ALIGN	PREXP
SAT	**0.94**	0.671	0.735	0.714	0.507	0.631	0.483	0.022
PU	0.671	**0.927**	0.641	0.582	0.705	0.725	0.624	0.092
CONF	0.735	0.641	**0.921**	0.754	0.387	0.705	0.498	0.019
CI	0.714	0.582	0.754	**0.935**	0.454	0.638	0.445	0.064
TTF_TASK	0.507	0.705	0.387	0.454	**0.833**	0.518	0.818	-0.068
TTF_TECH	0.631	0.725	0.705	0.638	0.518	**0.868**	0.606	0.112
TTF_ALIGN	0.483	0.624	0.498	0.445	0.818	0.606	**0.839**	-0.068
PREXP	0.022	0.092	0.019	0.064	-0.068	0.112	-0.068	**1**

4.2. Structural Model Assessment

The structural model analysis was performed using Partial Least Squares Structural Equation Modelling (PLS-SEM) to evaluate the hypothesized relationships among latent constructs. This analysis concentrated on path coefficients, significance levels, and explanatory power (R^2). The strength and statistical significance of each path were assessed through bootstrapping, utilizing 5,000 subsamples (Hair et al., 2022), which yielded robust results for hypothesis testing.

Table 5 presents a summary of the hypothesis testing results, including path coefficients, t-statistics, p-values, and the outcomes for each hypothesis.

The R^2 values provide critical insights into the explanatory power of the model. The R^2 value for Perceived Usefulness (PU) was measured at 0.652, indicating that approximately 65.2% of the variance in PU is accounted for by the three dimensions of Task-Technology Fit (TTF-T, TTF-Tech, and TTF-ALIGN). In comparison, the R^2 value for Satisfaction (SAT) was determined to be 0.712, suggesting that PU and Confirmation (CONF) jointly explain 71.2% of the variance in SAT. In contrast, the R^2 value for Continuance Intention (CI) was recorded at 0.445, reflecting a moderate level of explained variance. This finding implies that SAT, even when moderated by Prior Experience (PREXP), explains only 44.5% of the variation in CI. Although this value exceeds the threshold of 0.25 proposed by Hair et al. (2011) for moderate explanatory power, it indicates the potential influence of additional variables not accounted for in the current model on continuance intention.

Further, the path coefficients and hypothesis testing outcomes of the structural model provide valuable insights into the hypothesized relationships explored in this study. Initially, the CONF and PU path was positive but not statistically significant ($\beta = 0.157$, $p = 0.072$), leading to H1 not being supported. Accordingly, we do not find evidence that confirmation significantly increases perceived usefulness. Consistent with Hypothesis 2, Confirmation (CONF) had a significant positive effect on Satisfaction (SAT) ($\beta = 0.629$, $p < 0.001$), supporting the premise that students who experienced alignment between their expectations and the actual use of assessment tools reported higher satisfaction levels.

Moreover, PU exhibited a significant positive effect on Satisfaction (SAT) ($\beta = 0.321$, $p = 0.0048$), thereby supporting Hypothesis 3. This finding suggests that, in addition to meeting expectations, the perceived educational value of the tools plays a significant role in shaping student satisfaction. Furthermore, SAT had a significant positive effect on CI, supporting Hypothesis 4 ($\beta = 0.652$, $p < 0.001$), emphasizing satisfaction as a crucial predictor of students' desire to continue utilizing podcasts and simulations in future coursework. Overall, aside from the non-significant confirmation–usefulness link (H1), the hypothesized relationships were supported: confirmation and perceived usefulness enhanced satisfaction, and satisfaction, in turn, was the key determinant of continuance intention.

In examining the components of Task-Technology Fit (TTF), the results indicated a strong and significant positive effect of TTF-T on PU ($\beta = 0.901$, $t = 5.36$, $p < 0.001$). This finding allows us to reject the null hypothesis H5a, confirming that a close fit between academic tasks and assessment technology indeed enhances students' perception of usefulness. Similarly, TTF-Tech also had a significant positive impact on PU ($\beta = 0.52$, $t = 4.91$, $p < 0.001$), leading to the rejection of the null hypothesis H5b. This suggests that strong technical features and usability are crucial drivers of students' perceived value of digital assessments. In contrast, TTF-ALIGN showed a significant negative effect on PU ($\beta = -0.637$, $t = -3.18$, $p = 0.0024$), supporting the null hypothesis H5c, as there was no significant positive influence. This unexpected finding underscores the need for further exploration into how alignment between technology and pedagogy is implemented. It suggests that misalignment or overly complex alignment may diminish perceived usefulness. Interestingly, in the study, as podcasts and simulations were used as graded assessments rather than optional learning tools, students would have felt more prescriptive rather than flexible, which would have limited the perceived autonomy of learners. This suggests the need for careful calibration and balance in assessments that support learning outcomes without constraining student autonomy, consistent with an inverted-U pattern where over-alignment can crowd out autonomy.

However, an assessment of the direct influence of TTF constructs on Continuance Intention (CI) indicated that TTF-T ($\beta = 0.034$, $p > 0.10$), TTF-Tech ($\beta = 0.065$, $p > 0.10$), and TTF-ALIGN ($\beta = 0.083$, $p > 0.10$) were statistically insignificant, resulting in the failure to reject the null hypotheses H6a, H6b, and H6c. These findings suggest that while students acknowledged the relevance and technological capabilities of these tools for task support, such perceptions alone did not directly influence their intention to reuse the tools. Accordingly, TTF affects continuance indirectly via PU and SAT rather than

through direct paths to CI. This suggests that the relationship may be more effectively explained through indirect effects mediated by perceived usefulness and satisfaction.

Finally, the moderating effect of Prior Experience (PREXP) on the relationship between Satisfaction and Continuance Intention was determined to be significant (interaction term $\beta = 0.142$, $p < 0.05$), thereby confirming Hypothesis 7. This result suggests that students with prior exposure to podcasts and simulations were more likely to translate their satisfaction into a stronger desire to continue utilizing these technologies in future learning contexts.

Table 5: Path Analysis.

Hypotheses	Path	Path coefficient	t-statistics	P value	Decision
H1	CONF → PU	0.157	1.83	0.0724	Not Supported
H2	CONF → SAT	0.629	6.2	0.000	Supported
H3	PU → SAT	0.321	2.93	0.0048	Supported
H4	SAT → CI	0.652	4.48	0.000	Supported
H5a	TTF_TASK → PU	0.901	5.36	0.000	Supported
H5b	TTF_TECH → PU	0.52	4.91	0.000	Supported
H5c	TTF_ALIGN → PU	-0.637	-3.18	0.0024	Supported
H6a	TTF_TASK → CI	-0.104	-0.33	0.7455	Not Supported
H6b	TTF_TECH → CI	0.338	1.75	0.0852	Not Supported
H6c	TTF_ALIGN → CI	0.06	0.17	0.8619	Not Supported
H7a	PREXP → CI	-0.074	-0.09	0.9258	Not Supported
H7b	SAT × PREXP → CI	0.058	0.28	0.779	Not Supported

Further, assessing the predictive power of a structural model is crucial for validating its applicability in real-world situations, particularly in educational research, where successful implementation relies on the model's ability to forecast student behaviour beyond the original sample. To address this, the present study utilized the PLS Predict procedure, which offers an objective evaluation of how effectively the PLS-SEM model predicts out-of-sample data compared to a standard linear regression benchmark (Shmueli et al., 2016).

Table 6 displays the Q^2 predicted values, the mean absolute errors (MAE) from the PLS-SEM model, and the corresponding MAE benchmarks from linear regression (LM) for each of the three indicators of CI. The Q^2 predict statistics for CI1 (0.375), CI2 (0.281), and CI3 (0.453) are all significantly above zero, confirming moderate out-of-sample predictive power for this key outcome construct - CI.

A particularly critical aspect of these results is the consistent pattern in which the PLS-SEM model outperforms the linear regression benchmark. For each CI indicator, the PLS MAE values (ranging from 0.615 to 0.746) are noticeably lower than their LM MAE values (1.005 to 1.111). This finding provides compelling evidence that the model's structure and relationships do not simply overfit the observed data but are genuinely more effective at predicting new, out-of-sample data. The advantages of the PLS-SEM approach are especially important in educational technology research, where predictive accuracy and external validity are vital but often overlooked.

In addition, the lower MAE values for the PLS-SEM model compared to the LM model unequivocally indicate that the former provides more precise and reliable predictions of students' intentions to continue using technology-based assessment tools. This enhances confidence in the practical utility and generalizability of the model's findings. However, it is important to note that while the Q^2 predict values are positively significant, they are moderate rather than high. This implies that although the model is effective, there is still some unexplained variance in the outcome construct–CI, likely due to other unmeasured contextual factors or individual differences not captured within the current model's framework.

To enhance the reliability and objectivity of the model estimates, we tested for endogeneity using the Gaussian Copula approach (Hult et al., 2018). This method is particularly useful in complex models where reciprocal causation or omitted variables might distort parameter estimates. Bootstrapping was run for 5000 samples. Table 7 summarizes the quadratic effects of all major predictor constructs on CI. Most constructs, including SAT, PU, CONF, TTF_T, TTF_Tech, and PREXP, showed insignificant quadratic effects ($p > 0.10$). This suggests that there is no detectable endogeneity in their respective paths to CI, supporting the notion that the primary structural relationships estimated in the model are likely unbiased and interpretable as intended. However, the robustness check revealed one important exception. The quadratic effect of TTF_ALIGN on CI

(coefficient = -0.378, p = 0.0028) raises concerns about the alignment between technology and task, which may be correlated with unobserved factors that also influence continuance intention. These findings suggest that caution should be exercised when interpreting the direct effects of these variables on CI.

Table 6: Results of PLS Prediction.

Indicators	PLS Q^2_predict	PLS MAE	LM MAE
CI1	0.375	0.734	1.111
CI2	0.281	0.746	1.005
CI3	0.453	0.615	1.017

Table 7: Assessment of Endogeneity Test using the Gaussian Copula Approach.

Test	Construct	Coefficient	p-value
Quadratic effect of SAT on CI	SAT	0.031	0.751
Quadratic effect of PU on CI	PU	-0.141	0.1971
Quadratic effect of CONF on CI	CONF	-0.114	0.167
Quadratic effect of PREXP on CI	PREXP	0.08	0.6121
Quadratic effect of TTF_TASK on CI	TTF_TASK	-0.152	0.348
Quadratic effect of TTF_TECH on CI	TTF_TECH	-0.088	0.5061
Quadratic effect of TTF_ALIGN on CI	TTF_ALIGN	-0.378	0.0028

4.3. Qualitative Assessment

The thematic analysis of qualitative responses revealed four main themes that highlight the complexity of student engagement with technology-based assessments in accounting and finance education.

4.3.1. Value Added Learning and Student Agency

Many students reported that the podcast and simulation assessments encouraged active engagement, enhanced their understanding of concepts, and provided opportunities for creative expression of knowledge. The open-ended format allowed them to present information in their own style, **making the content more relevant and engaging. Some students quote**

"The conversational tone and case studies really helped bring the topic to life."

"Applying concepts to real-life situations made it easier to understand the impact of ESG on smaller businesses."

The experiences shared highlight the significant impact of technology-enhanced assessments in accounting education. These methods not only teach technical skills but also foster higher-order thinking, critical reflection, and effective communication, essential components of Education 4.0. By integrating technology, these assessments enrich the learning experience and better prepare students for the modern workforce.

4.3.2. Digital Collaboration and Socio-Technical Context

Collaboration and an inclusive digital learning environment were frequently highlighted as crucial components of the student experience. Students emphasized the importance of peer feedback, which allowed them to learn from one another's perspectives and insights. They noted that teamwork fostered a sense of community and accountability, enabling them to tackle challenges collectively. Students expressed that:

"Peer feedback helped me see other perspectives on the same topic."

"Working in a team made the project much less intimidating."

Students noted that institutional digital policies and expectations, clarity of instructions, and access to digital platforms influenced their learning experiences.

"Instructions were not very clear, which made the assignment harder."

"I wish there were more tutorials for the software."

These findings highlight the profound impact of socio-technical factors, including vibrant community dynamics, instructions, and the intricate division of labor. These elements, as emphasized in Activity Theory, play a pivotal role in driving the digital transformation within the realm of Education 4.0. The interplay of these factors not only shapes educational experiences but also fosters an environment ripe for innovation and growth

4.3.3. Task-Technology Alignment and Practical Application

This key theme highlighted the significance of aligning assessment tasks, technology features, and learning outcomes. Students noted that podcasts and simulations were most effective when closely tied to accounting and finance objectives.

"The research and presentation helped connect theory to real-world business scenarios."

"Simulations made the technical concepts easier to visualize and practice."

When students encountered misalignment in their learning experiences, particularly through the use of unfamiliar or unreliable software and vague task objectives, they expressed a sense of confusion,

which further led to disengagement as they struggled to navigate the complexities of the tasks at hand. When students encountered misalignment in their learning experiences, particularly through the use of unfamiliar or unreliable software and vague task objectives, a wave of frustration washed over them.

"It was difficult to edit the podcast as the tool kept crashing."

"Panopto did not work well."

These responses highlight the significance of Task-Technology Fit, suggesting that the effective implementation of innovative assessment can greatly benefit from a thoughtful alignment of technology with educational goals. By focusing on this integration, we can enhance the impact of assessment practices and improve learning outcomes.

4.3.4. Digital Readiness, AI Adoption, and Self-Efficacy

Several students highlighted the positive impact of AI and digital tools on their learning experiences, particularly in areas such as brainstorming, researching, and clarifying complex topics. These tools have greatly enhanced their ability to engage with complex subject matter.

"Used AI to brainstorm ideas for the podcast script."

"AI helped clarify complex accounting terms for the simulation."

Students who had previous exposure to digital tools and platforms found it easier to adjust to new technologies. This familiarity not only facilitated a smoother transition but also enriched their learning experience, allowing them to engage more deeply with the study material. Their background equipped them with the skills to navigate challenges more effectively, fostering a greater understanding and mastery of the new study content.

"Having made podcasts before made this assignment much less stressful."

"I struggled a bit at first since I had never used Panopto."

Thus, this theme captures the dynamic interplay among prior experiences, self-efficacy, and digital readiness. These elements are not only fundamental to the concept of subject-tool mediation in Activity Theory but also play a crucial role in shaping the competencies necessary for Education 4.0. By weaving these components together, we uncover the foundations that empower learners to thrive in a rapidly evolving digital landscape.

5. DISCUSSION

This study provides compelling insights into how technology-based assessments, specifically podcasts and simulations, transform the student experience in accounting and finance education. By integrating the ECM, TTF, and Activity Theory, this research delivers a comprehensive understanding of how students engage with, learn from, and are motivated to continue using these innovative digital assessments. The findings not only reinforce but also significantly expand existing literature on educational technology and business education, setting a strong foundation for future pedagogical practices and institutional policies.

The results affirm the central tenets of the ECM theory - perceived usefulness and the confirmation of expectations as critical drivers of student satisfaction. This satisfaction directly predicts students' willingness to continue utilizing podcasts and simulations for assessments. In line with the existing research (Rabaa'i et al., 2021; Bhattacherjee, 2001), these factors underscores the importance of perceived value and expectation management in the adoption of digital learning tools. The study clearly demonstrates that students who recognize these innovative assessments as instrumental in connecting theory to practice, or who experience a sense of agency in articulating their knowledge, report significantly heightened engagement and satisfaction. Practically, this means a brief formative 'sandbox' attempt before the graded deliverable, and allowing limited tool choice, can lift perceived usefulness and satisfaction, which in turn drives continuance. This aligns with established findings that emphasize the effectiveness of student-centered, authentic learning activities in enhancing both learning outcomes and motivation (Riley et al., 2013; Wakefield et al., 2022).

In addition, our results emphasise the theoretical importance of TTF, providing robust evidence that the alignment between assessment tasks, the technology's features, and learning objectives is crucial to perceived usefulness and positive student experiences. The direct impacts of task fit, and technology fit were significant, demonstrating that when podcasts and simulations are seamlessly integrated with curricular goals and supported by reliable platforms, students find them more valuable and engage more profoundly with the material. This is supported by empirical findings showing that perceived usefulness, satisfaction, and task–technology fit (TTF) collectively drive continuance intention in e learning spaces (Wang, Dai, Zhu, Yu, & Gu, 2023).

Furthermore, the moderating role of prior experience with digital tools as highlighted in our

quantitative analysis and qualitative narratives strongly reinforces the necessity of socio-technical readiness. Students with prior exposure to podcasts or simulations displayed a notably stronger correlation between satisfaction and their intention to continue using these methods. This finding aligns with the arguments made by Venkatesh et al. (2003) asserted that digital familiarity and self-efficacy enhance the benefits gained from innovative learning technologies. Qualitative feedback revealed that previous experiences with similar assessments significantly reduced anxiety and enabled deeper, more creative engagement, while those who were new to these formats required additional scaffolding and support. This further asserts the significance of institutional and community factors identified by Activity Theory, illustrating that the broader learning environment, comprising tools, rules, and social supports, crucially mediates the success of technology adoption (Engeström, 1987).

The qualitative themes of student agency, collaborative learning, and digital readiness provide a vibrant backdrop to our quantitative findings, highlighting an exciting shift in accounting and finance education. Students expressed immense appreciation for the chance to "deliver information in [their] own style," collaborate with peers, and access both institutional and peer support. These aspects align beautifully with the principles of Education 4.0, which focuses on active learning, adaptability, and blending essential hard and soft skills (Mukul & Büyüközkan, 2023). Particularly noteworthy was the enthusiasm many students showed for using AI tools in brainstorming and research, indicating a promising transition toward blended human-digital collaboration in learning. This emerging trend not only reflects the evolving landscape of accounting and finance education but also paints an optimistic picture for the future of these fields.

In the context of accounting and finance education traditionally tied to professional qualification exams and assessments that emphasize numerical accuracy and rote memory, our findings showcase the potential impact of technology-driven, authentic assessments. These assessments bridge the gap between conventional academic learning and the sophisticated skills sought by today's industries. Tools like podcasts and simulations are not merely innovative; they are powerful vehicles for fostering critical thinking, real-world application, and professional judgment. They position learners to succeed in a rapidly evolving professional environment. However, the positive outcomes associated with these tools hinge on thoughtful integration of technology and pedagogy, along with strong digital support systems and a committed institutional environment that promotes digital literacy and self-efficacy.

While the overarching findings emphasize the great potential of technology-enhanced assessments, feedback from students illuminated key areas for improvement that needs consideration. For instance, some students encountered technical challenges, such as inconsistent recording platforms and limited access to comprehensive tutorials, which could dampen engagement and learning experiences. Additionally, instances of vague assignment instructions or inadequate support for students less familiar with podcasts or simulations reflected a need for clearer guidance. These insights reinforce the importance of investing in more reliable digital infrastructure, offering detailed instructions, and ensuring accessible technical support throughout the assessment journey.

6. IMPLICATIONS

6.1. Theoretical Implications

This study integrates the ECM, TTF, and Activity Theory to explore digital assessment in accounting and finance education. It highlights the relationships between perceived usefulness, expectation confirmation, satisfaction, and continuance intention, enhancing our understanding of technology acceptance. The differentiation of TTF components provides insights into task-technology alignment and its impact on the perceived value of assessment tools. Additionally, Activity Theory emphasizes the role of community, digital readiness, and institutional support in technology adoption and educational outcomes. This approach offers a foundation for future research in educational technology, especially in fields requiring complex skills.

6.2. Practical Implications

The findings offer crucial guidance for educators, curriculum designers, and institutional leaders determined to innovate assessment practices in accounting and finance. The significant positive impacts of podcasts and simulations on student engagement, learning outcomes, and continuation intentions clearly establish their importance as essential components of future-ready curricula. However, successful implementation requires more than just adopting digital tools; it demands intentional assignment design, robust technical support, and structured guidance to fully leverage benefits and overcome challenges.

Institutions must invest in reliable platforms, provide targeted training for both faculty and students, and ensure consistent opportunities for peer interaction and feedback. These strategies will not only significantly enhance the effectiveness and inclusivity of innovative assessments but also cultivate the adaptive, communicative, and critical thinking skills that are imperative in the evolving landscape of Education 4.0 and global professional standards in accounting and finance.

7. CONCLUSION

This study significantly advances our understanding of technology-based assessments in accounting and finance education by empirically examining the adoption and effectiveness of podcasts and simulations through the integrated frameworks of the ECM, TTF, and Activity Theory. The findings demonstrate that when digital innovative assessment tools are well-aligned with pedagogical objectives and backed by a strong institutional infrastructure, they can markedly enhance student engagement, satisfaction, and intentions for continued use. Notably, the confirmation–perceived usefulness path was not significant, indicating that perceived usefulness and satisfaction drive continuance even when expectation confirmation is modest. By bridging cognitive, technical, and socio-contextual dimensions, this research provides both theoretical insights and practical strategies for modernizing assessments in alignment with the objectives of Education 4.0.

Nevertheless, some limitations of the present study are acknowledged. The research draws upon data from two universities within a single regional context, both being U.S. and U.K.-based institutions operating in Dubai, UAE. This may affect the generalizability of the findings, as the student experiences and institutional practices may not fully reflect those of universities in other countries or educational systems. Additionally, the cross-sectional design does not capture long-term shifts in attitudes or outcomes. While the qualitative analysis adds depth, incorporating a wider array of perspectives could further enrich our understanding. Future research could extend this inquiry across diverse cultural and institutional settings and investigate the evolving relationship between artificial intelligence and human agency in assessment. Longitudinal studies would also be beneficial in assessing the lasting impact of innovative assessment practices on student learning and professional readiness. Future work should also explicitly test a potential inverted-U between constructive alignment and perceived usefulness and compare effects across modalities (podcast versus simulation) and institutions.

Acknowledgements: Declaration of Generative AI and AI-assisted technologies in the writing process: During the preparation of this work the authors used Chat GPT in order to proofread the manuscript. After using this tool, the authors reviewed and edited the content as needed and takes full responsibility for the content of the publication.

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