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From Knowledge To Action: Evaluating The Effectiveness of Emerging Technologies in Enhancing Tax Compliance Readiness among University Students

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Abstract: The fast-moving digital revolution in the education sector has transformed how future taxpayers learn and prepare to comply. The conceptual paper is a discussion of the use of emerging technologies like AI-assisted learning, gamification of tax simulations, and digital tax laboratory to increase the readiness of tax compliance among university students in Malaysia and Indonesia. Based on the Technology Acceptance Model (TAM) and Transformative Learning Theory (TLT), the developed framework describes the role of digital learning engagement, perceived usefulness, and reflective learning in developing compliance-oriented behaviour. The paper adds to theory by developing TAM and TLT in a tax education setting and provides implications for the use of technology-based curriculum to produce ethical and digitally skilled taxpayers.

Keywords: *Emerging technologies, digital tax education, tax compliance readiness, Technology Acceptance Model (TAM), Transformative Learning Theory (TLT), higher education*

1. Introduction

The emerging digital technologies have significantly changed the world's tax administration and education systems due to their rapid development. Electronic filing, blockchain verification, and data analytics are becoming more popular with tax authorities to achieve a better level of transparency and compliance efficiency (Ariyibi et al., 2024). The Inland Revenue Board (IRBM) in Malaysia has increased its e-Filing and MyTax (Hasil.gov.my, 2025). Nevertheless, Indonesia, via Direktorat Jenderal Pajak (DJP), encourages digital tax ecosystems in line with its reform of the core tax system (Pajak.go.id, 2025). The changes would entail the future taxpayer developing digital literacy and ethical awareness that would see them meet taxes in the data-driven world. The evolution of learning has taken a new shape in the field of education due to digitalisation in the sector through the creation of artificial intelligence (AI) (Barakina et al., 2021). As a result, virtual simulations and gamification of learning offer learners hands-on and interactive learning. However, there is little research exploring the impacts of digital aid in increasing student intention to pay taxes in reality.

In a study conducted in Malaysia and Indonesia, it has been shown that students are now technologically prepared, but not prepared to act and provide voluntary compliance on a digital platform. The gap is filled in the paper, which conceptualises the use of emerging technologies in the stimulation of readiness to comply with tax. It will be defined as cognitive, behavioural and ethical preparedness to conduct in a responsible fashion with digital tax systems (Okunogbe & Santoro, 2023). It relies on the Technology Acceptance Model (TAM) and the Transformative Learning Theory (TLT), which implies a model of the relationship between engaging in digital learning, literacy, ethical reflection and compliance intention (Alshammari & Alkhwaldi, 2025). It rests on the comparison of contexts between Malaysia and Indonesia, which enables proceeding with the theoretical convergence and offering policy recommendations for the introduction of digital tax education to higher learning programs.

Research Objectives

- To examine how emerging technologies influence tax compliance readiness
- To identify the mediating effects of engagement and digital literacy
- To develop a framework linking digital learning with compliance readiness

Research Questions

- How do emerging technologies shape readiness for tax compliance?
- What is the role of engagement and literacy?
- How can a conceptual framework be developed to explain the pathways through which digital learning engagement and literacy translate into tax compliance readiness among university students?

2. Literature Review

Emerging Technologies in Higher Education

Emerging technologies have transformed how individuals study at higher learning, such as artificial intelligence (AI), virtual reality (VR), augmented reality (AR) and game-based learning tools. These are tools that promote active learning through simulation-based environments and feedback (Komasawa & Yokohira, 2023). According to the study by Avsec (2023), technology-enhanced instruction facilitates a greater degree of conceptual knowledge, especially in the subjects that require problem-solving in an analytical manner, such as accounting and taxation. The gap between theory and practice is addressed with the help of gamification and simulation games that lead to an increase in motivation and interest in the learners (Rivera & Garden, 2021). The synergies between AI-based tutoring and adaptive learning analytics would enable the formation of personalised feedback loops and improve the digital literacy and critical thinking (Strielkowski et al., 2025). However, institutional preparedness and infrastructure remain inequalities that curtail the maximum potential of such innovations, particularly in developing situations, as in the cases of Malaysia and Indonesia.

The higher education sector is changing with emerging technologies that will make education more accessible, engaging, and personalized. Virtual reality, artificial intelligence, and adaptive learning platforms are tools that allow students to study complicated subjects in a complex, interactive, and gradual manner. The digital collaboration tools and cloud computing promote the concept of global connectivity, which enables learners and educators to exchange resources and ideas freely. Data analytics also assists institutions in monitoring student progress and the services to be delivered. Besides, blockchain provides secure credentialing and management of academic records (Ayub Khan et al., 2021). These technologies not only enhance learning but also equip students with a future-ready, inclusive and technologically-oriented workforce, making higher education more dynamic.

Tax Education and Digitalisation

The traditional approach to teaching tax has been focused on theoretical knowledge and hand calculation. Nevertheless, the transition to the digital taxation system requires a pedagogical realignment. Jalgasbaevna et al. (2025) posit that colleges and universities should restructure their tax education curriculum to be more digital competence and applied literate by making sure that graduates can work with e-filing systems, tax analytics apps and cloud-based compliance solutions. Digital tax lab and simulation-based assignments are beginning to be used in Malaysia to develop applied knowledge (Yusvana, 2024). However, Fatmasari et al. (2023) state that in Indonesia, there is a lack of success in integrating technology in tax education because of the limitations of resources. Ratnawati & Darmanto (2023) discovered that perceived usefulness and involvement of core tenets of the Technology Acceptance Model (TAM) have a strong impact on the acceptance of online tax learning by students. This implies that digitalisation of tax education not only increases cognitive knowledge but also determines behavioural intention to act in compliance with tax interaction in the future.

Digitalisation is an important component of contemporary tax training because it makes the learning process accessible, efficient, and interactive. Complex tax concepts can be learned by using simulations, online platforms and e-learning tools, which enable students to use real-world scenarios and automated calculations (Bakar et al., 2023). Electronic materials allow the delivery of more recent content, given the constant changes in taxation and regulations. Online learning and teleconferencing support teamwork between students and practitioners worldwide. Besides, the digital tools will be used to build applicable skills in tax software and data analysis, equipping students with the constantly changing requirements of the industry. Overall, digitalisation helps to improve the quality and topicality of tax education in the rapidly changing financial environment.

Tax Compliance Readiness

The tax compliance readiness is an indicator of the willingness of individuals to handle tax systems voluntarily, correctly, and morally. It is a transition period between learning and civic action by the university students (Taing & Chang, 2021). Research in Indonesia and Malaysia points to the fact that education on taxation raises awareness among students, but they are not always prepared, both practically and ethically, to put this knowledge into practice (Mohamad et al., 2023). This preparation is mediated by digital literacy and engagement that facilitates the translation of the abstract knowledge into compliance behaviour. Moreover, ethical reflection, which is highly emphasized in Transformative Learning Theory (TLT), strengthens

internalized motivation towards responsible tax behaviour. Therefore, the use of the latest technologies in tax education not only enhances the competence of the relevant skills but also the mentality that leads to sustainable compliance.

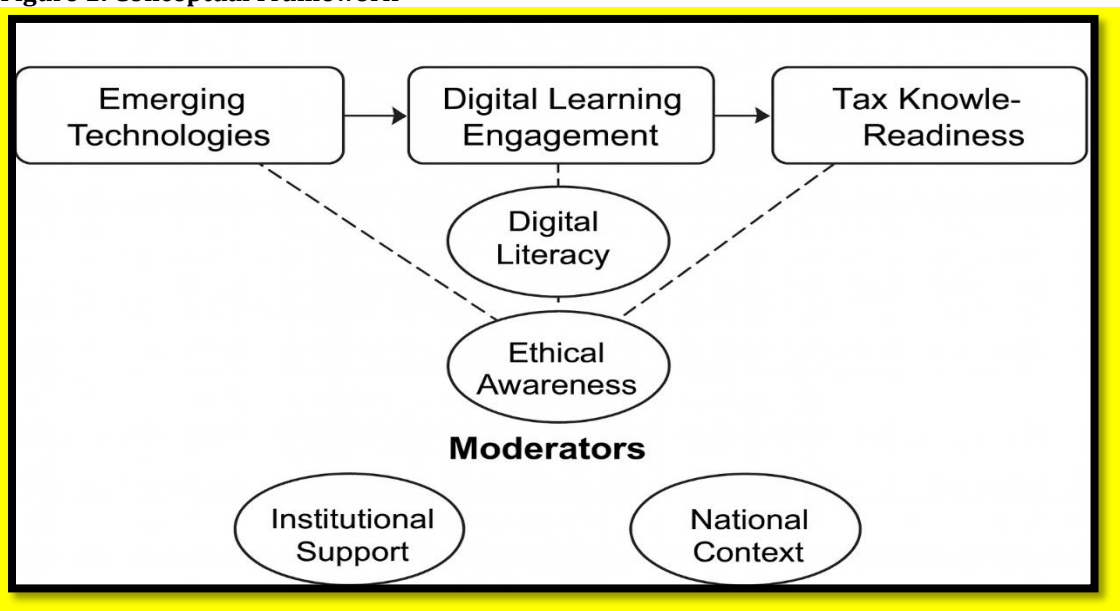
Tax compliance readiness is the ability of an organization or an individual to fulfil the tax liability in the correct manner and on time. It entails the existence of correct systems, processes and knowledge to keep up with the existing tax laws and regulations. This encompasses keeping proper financial records, knowledge of the tax codes, tax software, and acquiring awareness of the change of legislation (Elumilade et al., 2022). Readiness also implies that one is prepared to conduct audits, make returns properly and reduce chances of punishment or litigation. In the current digital age, preparation of tax compliance usually incorporates the use of technology to facilitate reporting, accuracy and transparency in the financial activities.

Theoretical Foundation

The Technology Acceptance Model (TAM), which has been extensively used in educational and behavioural research, determines the acceptance and use of new technologies by individuals based on two major factors, namely perceived usefulness (PU) and perceived ease of use (PEOU). According to recent studies, the interest of students in educational technologies is largely conditioned by their attitude that technology contributes to the effectiveness of the learning process and decreases the cognitive strain (Li et al., 2024). In the field of tax education, TAM offers a model of the process of adoption of digital solutions by learners, including e-filing simulators, AI-based tutorials, and online tax laboratories. An increased level of usefulness and usability translates into increased engagement, which, consequently, forecasts willingness to use the knowledge of taxes in digitalised and practical settings (Opiso et al., 2023). Combining TAM and TLT, therefore, provides a holistic perspective to the technological acceptance process as well as the behavioural change process. Although TAM explains the reason why students use digital tax learning tools, TLT describes how the experiences evolve cognitive, ethical, and willingness to act responsibly in real-life tax situations.

TAM is concerned with adoption and behavioural intention towards technology, whereas Transformative Learning Theory (TLT) is concerned with cognitive and reflective change, which takes place through critical reflection on experience. TLT assumes that the process of learning is transformational as one challenges their assumptions and forms new insights in the process of learning by engaging in activities and dialogues (Bleiler, 2023). In the application to tax education, TLT describes how technology-mediated learning environments, such as virtual simulation or gamified case study, ensure critical reflection, leading to ethical awareness and behavioural readiness to comply (Li, 2022).

Figure 1: Conceptual Framework



Source: Self-Developed

This paper is a proposal of a concept model of how the emerging technologies in the sphere of higher education can make university students more prepared for tax compliance by means of digital involvement and literacy. It is based on the Technology Acceptance Model (TAM) and Transformative Learning Theory (TLT), which involves technology adoption and reflective behavioural change. Digital learning can be triggered through emerging technologies like AI-based learning applications, tax simulations through gamification, and virtual tax labs that promote engagement in learning and active participation, as well as long-term motivation (Celestin et al., 2024). Engagement improves digital literacy, which is the skill to make effective use of technological tools, navigate and interpret them in solving problems (Wei, 2024). By being developed in literacy, the students develop tax knowledge, but this is not just based on conceptual knowledge but also on the practical skills of e-filing, data interpretation, and compliance procedures.

In this model, it is assumed that ethical awareness and digital literacy interfere with digital engagement and readiness to comply. Literacy allows students to operationalize knowledge effectively and ethical understanding that is brought about by reflective and transformative learning promotes responsible behaviour. In the meantime, institutional facilitation, such as the availability of digital tools and pedagogical innovation and the national environment, mediate such associations by influencing the learning conditions and level of digital preparedness (Wang et al., 2024).

3. Methodological Approach

The chosen research design is the conceptual research design, which incorporates the synthesis of theoretical knowledge and logical reasoning to suggest a framework that will be able to connect emerging technologies and tax compliance readiness. Conceptual papers can be useful in promoting theoretical knowledge by bringing together the missing empirical knowledge into a consistent framework, which can subsequently be used to inform future research (Kozlenkova et al., 2025). In this respect, this paper will organise evidence based on the recent literature on digital pedagogy, technology acceptance and tax behaviour to reveal how technological involvement can convert tax knowledge into compliance-related action. The conceptual model had a development that was in three stages, so as to make it possible in the evaluation process.

In order to start with, the literature reviews on the Technology Acceptance Model (TAM) and Transformative Learning Theory (TLT) were conducted to reveal behavioural and reflective learning constructs that applied to tax education. Second, the results of the empirical research in Malaysia and Indonesia were contrasted to ensure the differences in contexts in relation to digital readiness, technology infrastructure, and pedagogical practices (Omar & Mohmad, 2023). Third, the synthesized insights were used to suggest causal relationships among the emerging technologies, digital literacy and compliance preparedness. Although the current paper is theoretical, it forms a basis for empirical validation in the future.

Future research can utilise mixed methods and start with the qualitative approach of interviewing students and teachers, as well as conducting focus groups with these groups, to obtain a better understanding of constructs. Structural Equation Modelling (SEM) is the next method used to verify hypothesised relationships quantitatively (Fauzi, 2022). The comparative ASEAN approach working on Malaysia and Indonesia provides a chance to investigate the role of national digital policies, national cultural perception of taxation, and institutional support to behavioural readiness (Ananda, 2025). This approach creates a solid theoretical generalisability and policy relevance across the emerging economies.

4. Findings and Discussion

The given framework expects an optimistic but indirect impact of emerging technologies on the readiness of students to comply with taxes, with the mediation of digital engagement, literacy, and ethical awareness. According to the Technology Acceptance Model (TAM), the more students consider digital tax learning platforms as helpful and simple to use, the more they will become active users of them (Wulandari & Dasman, 2023). This interaction increases learning motivation and interactivity, which results in better digital literacy and knowledge of tax (Rashid et al., 2023).

Based on the Transformative Learning Theory (TLT), critical reflection can also be provoked by the involvement in the technology-enhanced environment, enabling students to reconsider taxation as not only a technical necessity but a moral and civil duty (Noroozi, 2025). This process of reflection enhances awareness of ethics, which, in combination with literacy, is likely to turn digital knowledge into behaviour with compliance orientation. Therefore, the interplay of the adoption constructs on the adoption side of TAM and the reflective learning aspects on the learning side of TLT offers a two-way channel through which technological and cognitive aspects are integrated into readiness.

Malaysia and Indonesia differ in terms of context and this could affect such relationships. The more advanced digital architecture of Malaysia, as well as its widespread adoption of online learning technologies, will probably produce a better degree of engagement and literacy (Kamaruddin et al., 2023). Conversely, the potential of these impacts depends on the level of uneven technological adoption that is emerging in Indonesia (Wiweko & Anggara, 2025). In both situations, however, institutional support and policy alignment are likely to increase the effect of digital pedagogy on readiness to comply. On the whole, the predicted results indicate that technology use is not enough but the transformational potential can be achieved only in the context of the reflective and ethically driven learning experiences.

Implications

Theoretical Implications

This article is a contribution to theory as this paper takes into consideration the Technology Acceptance Model (TAM) and the Transformative Learning Theory (TLT) to create a combined framework that describes the readiness to comply with taxes. TAM explains the intentions of an individual to adopt technology and TLT explains the thoughtful change that brings about ethical and cognitive transformation. Their synthesis fills the gap between the use of technology and the behavioural outcomes, which provide a multidimensional understanding of the way in which emerging technologies create compliance-oriented learning. Such synthesis broadens the current research on the digital pedagogy and behavioural tax studies by bringing the ethical reflection and digital literacy as mediating variables (Junaedi et al., 2023).

Practical Implications

The framework provides educators with useful guidance on curriculum development. Digital labs, gamified assessments, and AI-based models can all contribute to increasing confidence in digital technology as well as experiential learning (Marengo et al., 2025). Universities are expected to use transformational reflection exercises, such as ethical case assessments, that transform technical expertise into tax-responsible perspectives.

Policy Implications

The study proposes cooperation between universities and tax authorities at the policy level to integrate digital tax education into the agendas of national education. E-learning modules and virtual compliance platforms that are developed by institutions such as the IRBM in Malaysia and the DJP in Indonesia could replicate real tax systems. Such initiatives would produce a generation of digitally literate and ethically responsible taxpayers, and would assist them to make long-term compliance and be economically viable (Abdul Rashid & Ramli, 2024).

5. Conclusion and Future Research

The conceptual paper contributes to the body of knowledge on how university students can be tax compliance ready with the introduction of new technologies in the university to assist them to be digitally literate, engage and reflect on ethical issues. The research is rooted in the Technology Acceptance Model (TAM) and the Transformative Learning Theory (TLT) and suggests a novel integrative model of technology adoption and reflective behavioural change relationship. The framework highlights the fact that effective digital tax education cannot be reduced to technical competence but rather to moral awareness and civic duty that will assist in implementing it sustainably. The comparative focus of Malaysia and Indonesia provides valuable data to determine the way the contextual differences affect the online learning process of the students.

These findings are informative to policy-makers and academic establishments, as well as contributing to the theoretical explanations of digital education and research into tax behaviour. A combination of methods, such

as surveys, interviews, and modelling structural equations, should be tested experimentally in the future in terms of the suggested framework. This makes it possible to examine cross-country differences in ASEAN or other developing countries. Long-term longitudinal research can potentially be conducted to study the long-term implications of digital learning strategies on compliance actions. During the digital era, it is also strengthening the linkage between tax integrity and knowledge development.

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