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Motivation Meets Technology: An Integrated SDT–TAM Framework for Artificial Intelligence Adoption in Higher Education

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ABSTRACT

The rapid advancement of artificial intelligence (AI), particularly through large language models, has significantly transformed learning practices in higher education. Although AI technologies offer substantial potential to enhance academic performance, learning personalisation, and graduate employability, students' adoption and sustained use of AI remain uneven, especially within developing higher education contexts. Existing studies on AI adoption have largely relied on the Technology Acceptance Model (TAM) or Self-Determination Theory (SDT) in isolation and have primarily focused on initial adoption using quantitative approaches, leaving long-term motivational mechanisms underexplored. Addressing this gap, this conceptual paper proposes an integrative framework that synthesises TAM and SDT to explain students' behavioural intention to use AI and their actual AI usage in higher education. Drawing on TAM, the framework highlights the roles of perceived usefulness and perceived ease of use as proximal cognitive determinants of AI adoption. Complementing this perspective, SDT introduces autonomy, competence, and relatedness as distal motivational drivers that shape students' technology-related perceptions and sustained engagement. By positioning autonomous motivation as an antecedent to TAM beliefs, the integrated framework provides a more comprehensive explanation of both the "why" and "how" of AI adoption. The framework further links behavioural intention to actual AI usage and academic performance, emphasising the role of motivation in fostering meaningful and persistent engagement with AI tools.

1. Introduction

In the contemporary digital era, technological advancement has profoundly reshaped nearly every aspect of human life, with particularly significant implications for higher education. Artificial intelligence (AI), which initially emerged through rule-based systems reliant on predefined logic and explicit instructions, was historically limited to highly specialised tasks. Early AI applications, such as

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ELIZA and the Logic Theorist, demonstrated narrow functionality and domain-specific intelligence [29].

In recent years, however, AI has evolved rapidly with the development of large language models (LLMs), including Generative Pretrained Transformer, Claude, Gemini, and Perplexity AI. These models exhibit advanced capabilities across a wide range of domains, including education, healthcare, and industry, enabling more complex, adaptive, and human-like [27,32].

Within the educational context, AI technologies have increasingly been adopted to support academic activities, particularly among university students. Prior research indicates that students widely utilise AI tools for writing assistance, research support, and coursework completion [3]. According to the data from Freeman [14], the majority of students perceive AI mainly as a means for increased efficiency and academic improvement, with 51% utilising it to save time and 50% to improve their work quality. In practical situations, students use AI to support assessments in various ways, predominantly for clarifying complicated concepts (58%) and summarizing articles (48%).

In addition, AI-assisted learning has been shown to enhance various language skills, such as listening, speaking, reading, writing, and vocabulary acquisition through immediate feedback and personalised learning pathways. These features allow students to regulate their learning pace, promote engagement, and potentially improve academic performance. Despite these promising benefits, the integration and sustained use of AI technologies in higher education remain uneven and, in many contexts, relatively limited [1].

The rapid advancement of AI, automation, and data analytics is fundamentally transforming the higher education landscape. While AI has the potential to enrich learning experiences by fostering personalisation, improving engagement, and supporting academic outcomes, its adoption is not solely a technological issue. Instead, students' acceptance and effective use of AI tools are strongly influenced by psychological and motivational factors. Two theoretical frameworks are particularly relevant for understanding this phenomenon: the Technology Acceptance Model (TAM) and Self-Determination Theory (SDT). TAM posits that individuals' behavioural intention to use technology is primarily shaped by perceived usefulness and perceived ease of use. Complementing this perspective, SDT emphasises the role of intrinsic motivation, suggesting that students are more likely to engage with AI technologies when their needs for autonomy, competence, and relatedness are fulfilled [8].

In the Malaysian context, the relevance of AI adoption in higher education is further highlighted by national policy initiatives such as the Malaysia Education Blueprint (Higher Education) 2015–2025 and Industry 4.0 programmes, which aim to modernise the education system and align graduate competencies with global technological developments [26]. Nevertheless, AI integration across Malaysian universities remains uneven, resulting in varying levels of student exposure and readiness [18]. This inconsistency has implications for graduate employability, as employers continue to report skill gaps—particularly in technology-driven and high-growth sectors—despite increased collaboration between industry and academia. Consequently, graduates may struggle to meet labour market demands, thereby constraining Malaysia's progress towards a knowledge-based economy [19].

Although AI holds considerable promise in enhancing educational quality, learning personalisation, and career readiness, its implementation in Malaysian higher education is still at a nascent stage. Key barriers include a limited awareness of AI's educational potential, inadequate institutional infrastructure, and concerns related to data privacy, ethical use, and equity. At the student level, challenges such as low trust in AI systems, fears of privacy breaches, over-reliance on AI tools, and insufficient confidence in AI usage further impede meaningful adoption [20]. Despite

the growing body of literature on AI in education, limited conceptual integration of motivational and acceptance-based perspectives exists to explain students' engagement with AI tools.

Accordingly, this conceptual paper aims to develop an integrative framework that synthesises Self-Determination Theory and the Technology Acceptance Model to explain students' behavioural intention to use AI and their actual AI usage in higher education. By conceptually linking motivation, technology acceptance, and learning outcomes, this paper seeks to advance theoretical understanding of AI adoption and provide insights for educators, policymakers, and higher education institutions seeking to leverage AI to enhance academic performance and graduate employability.

There are many researchers who studied about the factors that motivate people to use AI by assigning SDT and TAM frameworks. But most studies are only focused on the initial of AI adoption. This creates a gap in understanding the long-term motivations and obstacles that affect ongoing AI involvement. Other than that, most of the findings are using quantitative method alone. Variables of interest are perceived ease of use, perceived usefulness [12,17], autonomy [28], relatedness [39] and competence [36], which may not sufficiently capture comprehensive information from the participants. Moreover, there are lack of research conducted within Malaysian universities context, this may cause the educators, students, policymakers, AI developers failed to efficiently adopt AI in higher education. Consequently, this gap could slow down the country's development toward achieving its long-term goals as students fail to equip with relevant digital skills necessary in this technology-driven world.

The structure of this paper is as follows: Section 2 on literature review; Section 3 on Discussions and proposed conceptual frameworks; and Section 4 on conclusion.

2. Literature Review

2.1 Self-Determination Theory (SDT)

Self-Determination Theory (SDT) reconceptualises motivation as a multidimensional construct that considers both the quantity and quality of motivation [31]. Departing from early theories that focused primarily on external rewards, SDT proposes that individuals possess three innate psychological needs—autonomy, competence, and relatedness—that drive intrinsic motivation and sustained engagement.

Autonomy refers to individuals' desire to experience volition and self-direction in their actions. In AI-supported learning environments, autonomy is enhanced through flexible, self-paced, and on-demand access to educational resources. AI tools such as ChatGPT empower students to control their learning processes, decide what content to engage with, and explore topics beyond classroom limitations [3,25].

Competence reflects individuals' need to feel capable and effective in accomplishing tasks [31]. AI tools contribute to competence by offering immediate feedback, personalised guidance, and skill enhancement across academic tasks such as writing, problem-solving, and language learning [4]. Prompt feedback provided by AI systems helps students identify weaknesses and refine their skills, thereby strengthening confidence and perceived capability.

Relatedness refers to the need to feel connected, valued, and supported through social interaction [30]. AI chatbots and conversational agents can foster relatedness by simulating human-like dialogue and sustaining interactive engagement [13]. These interactions promote a sense of belonging and support, particularly in digitally mediated learning environments.

Collectively, SDT provides a robust framework for understanding students' intrinsic motivation to engage with AI tools. When autonomy, competence, and relatedness are fulfilled, students are more likely to adopt AI voluntarily and consistently as part of their learning activities.

2.2 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) views user adoption not merely as a response to system availability, but as a cognitive process influenced by specific perspectives on usefulness and effort. Moving beyond past basic functional, TAM suggests that actual usage behaviour is influenced by a causal sequence originating from two main psychological foundations: perceived usefulness and perceived ease of use. These two foundations act as primary mediators between external variables such as system design, user training, and the user's ultimate behavioural intention to use technology [28].

Perceived usefulness is defined as the extent to which a user thinks a technology will improve his or her job effectiveness or performance. This is frequently regarded as the "utilitarian" incentive; users may accept certain operational challenges if they think the results will yield significant advantages for their personal or professional objectives [10,38].

Perceived ease of use refers to how little effort is required to use technology [10,38]. Although perceived ease of use is an important element in the initial stage of technology adoption, its impact often changes as user gain more skills; particularly, as experience grows, actions become "routinised" and occur in a "largely automatic fashion with minimal conscious control" (Ajzen, 2002, as cited in [38]). TAM indicates a causal relationship wherein perceived ease of use impacts perceived usefulness directly; a technology that is simpler to use is frequently seen as more beneficial as the user can allocate more cognitive resources to the actual task instead of focusing on the tool itself [35,38].

Connecting these perceptions to user attitudes and later adoption, the model offers a strong framework for understanding the psychological precursors to digital integration.

3. Discussions

3.1 The Integration of SDT and TAM Model

Despite their individual strengths, using TAM or SDT alone has various drawbacks. The main criticism of TAM is its narrow utilitarian focus. It views the user as a rational evaluator that focused solely on efficiency and effort. Other than that, it only offers a limited exploration of the complete spectrum of effects resulting from IT implementation. It generally centres on one straightforward outcome variable which is system utilisation, usually characterised by its frequency or volume [6]. According to [5], the creator of TAM, Fred Davis, has explicitly acknowledged that this model only focuses on extrinsic motivation and ignore the intrinsic motivation which is a significant missing piece in the original model. Furthermore, while SDT provides a strong framework for understanding human motivation, it does not take a stance on technology; it determines human actions but fails to address the particularities of the tool itself. This results in a widespread 'analytical vs. generative gap', where SDT functions as a valuable framework for evaluating systems after they have been developed, yet it does not provide the generative elements such as perceived ease of use that needed to define functional goals in the early design phrases [15].

This conceptual paper integrates Self-Determination Theory (SDT) and the Technology Acceptance Model (TAM) to offer a more comprehensive explanation of students' adoption of artificial intelligence (AI) technologies in higher education. While TAM has been widely applied to explain technology acceptance through instrumental beliefs such as perceived usefulness and perceived ease of use, it has been criticised for its limited consideration of human motivation and psychological needs. Conversely, SDT provides a robust framework for understanding why individuals are motivated to engage with technologies, yet it lacks explicit mechanisms explaining how

motivation translates into technology-related beliefs and usage intentions. By integrating these two theories, this study addresses the theoretical gaps in both models and advances a motivation-centred understanding of AI adoption in educational settings.

TAM posits that individuals' behavioural intention to use a technology is primarily driven by perceived usefulness and perceived ease of use. Although this model has demonstrated strong explanatory power across various technological contexts, including e-learning and digital platforms, its focus remains largely cognitive and utilitarian. In the context of AI adoption in higher education, such a focus may be insufficient, as students' engagement with AI tools often involves autonomy in learning, self-regulation, competence development, and intrinsic interest, which extend beyond instrumental evaluations.

By incorporating SDT, this study enriches TAM by introducing autonomous motivation as a foundational psychological driver shaping students' technology-related perceptions. SDT argues that individuals are more likely to internalise behaviours and persist in their use when their basic psychological needs for autonomy, competence, and relatedness are satisfied. When students perceive AI tools as supporting independent learning (autonomy), enhancing academic capability (competence), and facilitating meaningful interaction with peers or instructors (relatedness), they are more likely to form positive beliefs about the technology. This integration thus explains not only *whether* students adopt AI, but also *why* they perceive AI as useful and easy to use.

Although SDT has been extensively applied in educational and organisational contexts, its application in technology adoption research remains relatively limited. SDT primarily focuses on motivational orientations and behavioural persistence but does not explicitly account for technology-specific beliefs that are central to adoption decisions. By integrating TAM, this study extends SDT into the technology domain by proposing that motivational states influence cognitive appraisals of technology attributes, such as usefulness and ease of use.

In this integrated framework, autonomous motivation is conceptualised as an antecedent to TAM beliefs rather than a parallel predictor of behavioural intention. This position offers a theoretically coherent pathway whereby students' intrinsic interest and internalised values towards learning with AI shape their perceptions of AI functionalities. As a result, TAM variables act as proximal determinants, while SDT variables function as distal motivational drivers, strengthening the explanatory depth of the adoption process.

The integration of SDT and TAM is particularly relevant in the context of AI-driven learning environments, where students interact with adaptive systems, intelligent tutoring tools, and generative AI applications. Unlike traditional educational technologies, AI systems often require active engagement, experimentation, and trust, making motivation a critical determinant of sustained use. Students who feel pressured or controlled in using AI tools may comply temporarily but are unlikely to develop long-term engagement.

The integrated SDT–TAM framework highlights that AI adoption in higher education is not merely a matter of system design or technical efficiency, but also a function of how AI is positioned pedagogically. When AI tools are introduced in ways that support students' autonomy and competence, they are more likely to be perceived as valuable learning aids rather than external requirements. This insight contributes to the growing discourse on human-centred AI in education, emphasising the importance of aligning technological innovation with learners' psychological needs.

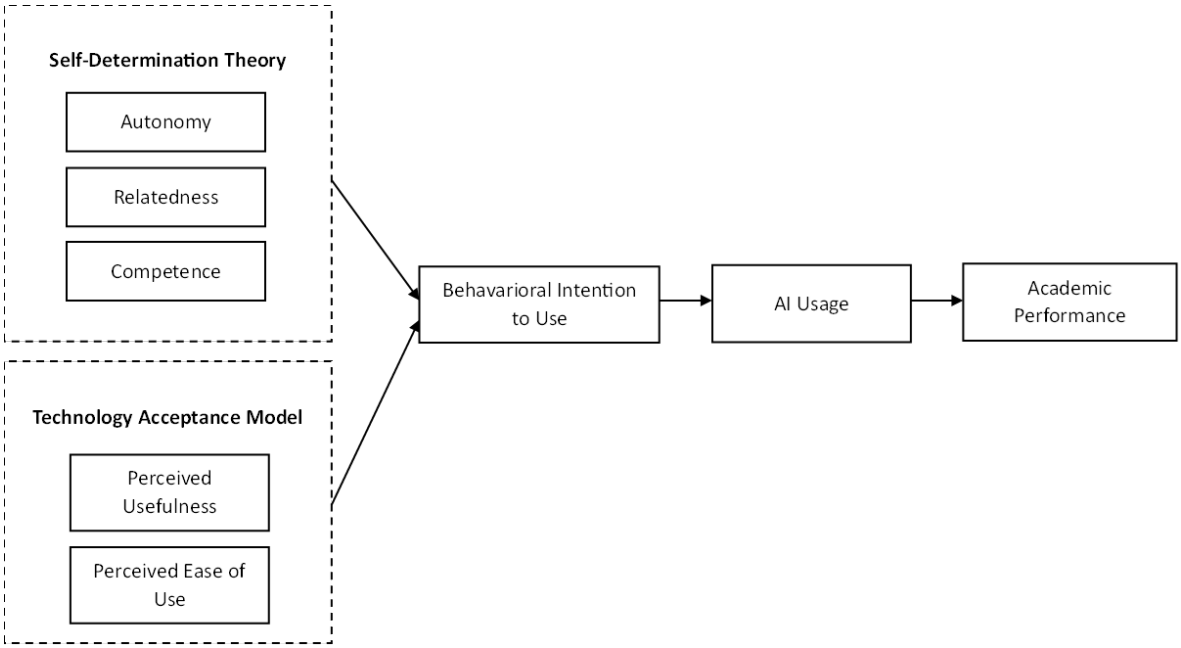

Fig. 1. Conceptual framework

3.2 Discussion on the Proposed Conceptual Propositions

Building upon the integrated SDT–TAM framework, this study proposes a set of conceptual propositions that explain the motivational and cognitive mechanisms underlying students' adoption of AI in higher education. These propositions are discussed below to clarify their theoretical significance and expected relationships.

3.2.1 The Relationship between Autonomy and Behavioural Intention to Use AI

H_0: There is no relationship between autonomy and behavioural intention to use AI
H_A: There is a relationship between autonomy and behavioural intention to use AI

According to the empirical findings conducted by Solihati *et al*., [34], it found that autonomy is significantly predicted students' behavioural intention to use AI for English learning. Students who believed that AI tools enabled them to learn independently and make their own decisions were more motivated to use them. Similarly, Yang [40] discovered that autonomy-related intrinsic motivations impacted students' perceptions of a technology used, which in turn influenced their intention. Furthermore, Alharbi [2] further support this statement in MOOC context. The researcher studied MOOC implementation in health informatics training. Although MOOCs are not AI systems, they serve as online educational technologies that require learners to take charge for their own studies. This research indicated that when students felt empowered and in charge of their learning decisions, they show greater intention to participate in MOOCs. Moreover, Cortez *et al*., [7] also proved that autonomy significantly influenced the intention to use AI. Together, these studies have suggested that autonomy is a strong predictor of behavioural intention to use AI.

3.2.2 The Relationship between Relatedness and Behavioural Intention to Use AI

H_0: There is no relationship between relatedness and behavioural intention to use AI
H_A: There is a relationship between relatedness and behavioural intention to use AI

According to Solihati *et al.,* [34], relatedness significantly forecasted students' behavioural intention to use AI for learning English. Students who believed that AI tools offered interactive or socially engaging experiences tend to use them. Additionally, Alharbi [2] showed that relatedness is notably predicted behavioural intention to use MOOCs. Students who perceived support and connection, whether via instructor involvement, peer networks, or platform interaction, were continued using online learning platform. Other than that, Wong and Tajudeen [39] found that relatedness enhanced users' perceptions of the Metaverse platform (a digital environment), subsequently affecting their intention to engage behaviourally. Although relatedness did not directly forecast intention in this study, having a sense of social support in the tech environment increased users' willingness to adopt AI. Jointly, these studies have suggested that relatedness is a strong predictor of behavioural intention to use AI.

3.2.3 The Relationship between Competence and Behavioural Intention to Use AI

H_0: There is no relationship between competence and behavioural intention to use AI
H_A: There is a relationship between competence and behavioural intention to use AI

According to Alharbi [2], competence had direct impact on the intention to use MOOCs. This indicates that when students perceive themselves as technically or academically proficient, they are more likely to use online learning platform. However, the study conducted by Solihati *et al.,* [34], reported that competence did not significantly impact intention to use AI. This difference can be explained by the nature of technology discussed in articles, as MOOCs require a more structured and content-focused competence, while AI tools provide more adaptable and personalised learning opportunities. In this case, students may not need to immediately view themselves as competent in the tools. Since AI tools like ChatGPT provide personalised learning, they could facilitate intention to use even when students don't feel "competent" in using them. Other than that, these studies were conducted in different cultural and educational settings, this could also impact the findings of them.

3.2.4 The Relationship between Perceived Usefulness and Behavioural Intention to Use AI

H_0: There is no relationship between perceived usefulness and behavioural intention to use AI
H_A: There is a relationship between perceived usefulness and behavioural intention to use AI

According to Liu *et al.,* [23], perceived usefulness is significantly influences users' behavioural intention to use AI-driven autonomous taxis. Similarly, Manolică *et al*., [24], in their study on AI in Digital Marketing, mentioned that Gen Z, who demonstrated greater familiarity of AI tools, exhibit a strong intention to use AI when they perceived it as useful for their everyday tasks and activities. This match with Davis [10] initial statement in the TAM, where perceived usefulness is directly related to usage intentions. Furthermore, study also examined how university students adopted ChatGPT, finding that perceived usefulness significantly influenced students' intention to use ChatGPT for their academic needs [11]. Other than that, Esiyok *et al*., [12] discovered that students who felt that chatbots were helpful for giving immediate assistance were more likely have strong intention to use them. This finding is further supported by Hussain *et al.,* [17] indicated that the intention of healthcare workers to adopt advanced medical technologies was strongly impacted by their perception of the system's usefulness in improving patient care and optimising workflow. Together, these studies proved that perceived usefulness could affect the intention to use AI.

3.2.5 The Relationship between Perceived Ease of Use and Behavioural Intention to Use AI

H_0: There is no relationship between perceived ease of use and behavioural intention to use AI
H_A: There is a relationship between perceived ease of use and behavioural intention to use AI

In study conducted by Duong *et al.,* [11], it found that perceived ease of use is significantly influence students' intention to use ChatGPT for learning. Students who think that ChatGPT is user-friendly were more likely to intend to use AI for their academic tasks. The research highlighted that a perception of minimal effort for using the AI tool will encourage a greater intention to use it consistently. This finding matches with Davis [10] initial claim, saying that when users view technology as user-friendly, easy to use, they will tend to engage with it. In healthcare context, Hussain *et al.,* [17] mentioned that nurses' perspectives on the user-friendly advanced medical technologies were significantly linked to their willingness to adopt these tools. This study indicated that nurses' intention to use medical AI systems into their daily clinical practice increased when they perceived these systems as comprehensible. Similarly, Manolică *et al.,* [24] also supported that perceived ease of use positively affected Gen Z's intention to use AI tools. Esiyok *et al.,* [12] stated that students' perceptions of ease of use was a strong predictor of behavioural intention to use AI. Collectively, these studies proved that perceived ease of use can affect the intention to use AI.

3.2.6 The Relationship between Behavioural Intention to Use AI and AI Usage

H_0: There is no relationship between behavioural intention to use AI and AI usage
H_A: There is a relationship between behavioural intention to use AI and AI usage

Behavioural intention refers to a person's internal attitudes or beliefs prior to participating in a specific action. This factor can determine if a person will participate in the behaviour [16]. According to Duong *et al.,* [11], the intention to use ChatGPT significantly predicted actual AI usage. Meaning that higher intention to use AI will directly lead to higher actual usage of AI for academic tasks like essay writing and problem-solving. Similarly, Esiyok *et al.,* [12] found that the intention to use AI chatbots was strongly related to actual usage. The results indicated that students planning to use AI chatbots for personalised learning and immediate feedback tend to interact with technologies more frequently. Additionally, Sitanaya *et al.,* [33] studied the implementation of ChatGPT in Jakarta's universities and highlighted a strong correlation between students' intention to us ChatGPT as a learning source and their actual usage. Furthermore, Tandon *et al.,* [37] investigated the AI adoption in medical training, and they found a similar finding. Their study showed that the intention to use AI tools like diagnostic assistants, was a direct predictor of their actual usage. Across all these studies, whether is in healthcare or education context, intention to use AI was a consistent predictor of AI usage.

3.2.7 The Relationship between AI Usage and Academic Performance

H_0: There is no relationship between AI usage and academic performance
H_A: There is a relationship between AI usage and academic performance

The increasing AI adoption in educational setting has shown a potential in improving academic performance. Dahri *et al.,* [9] examined the impact of ChatGPT on students' academic performance in a mobile learning environment. This research included two student groups: one experimental

group using ChatGPT for post-lesson evaluations and a control group using traditional method. The findings found that the experimental group has a great improvement in academic performance compared to the control group. This discussion can be supported by Lee *et al.,* [22], it stated that students who used AI chatbot for after-class reviews in public health curriculum has significantly led to higher academic achievement. Another study conducted by Khalkho *et al.,* [21], AI tools were discovered to affect students' study habits and academic performance. It showed that the use of AI tools could assist students in understanding challenging topics. Jointly, these findings indicate that AI tools can improve academic performance.

4. Conclusions

This conceptual paper integrates Self-Determination Theory and the Technology Acceptance Model to explain students' adoption of artificial intelligence in higher education. By synthesising motivational and cognitive perspectives, the proposed framework highlights that effective AI adoption depends not only on technological functionality but also on the extent to which AI tools support students' psychological needs.

Theoretically, this paper extends TAM by incorporating SDT, addressing limitations related to intrinsic motivation and sustained engagement. While TAM demonstrates the transition of technology from a conscious "tool" to an automatic "routinised" habit, where users no longer consciously think about which buttons to click as they have familiar with the tools, and students might stop using it if it doesn't fulfill their deeper demands. By integrating SDT, the model elaborates that when technology becomes automatic, the motivation for continuous usage shifts from external efficiency to the fulfillment of intrinsic needs. When the AI tool enhances a student's feeling of autonomy, competence, and relatedness, it transforms from a functional shortcut for grades into a genuine, psychologically rewarding extension of their educational experience. Practically, the framework offers guidance for higher education institutions, educators, and policymakers to design AI-enabled learning environments that promote autonomy, competence, and relatedness while ensuring usability and usefulness.

Aligning AI adoption strategies with students' motivational needs may enhance academic performance, improve digital readiness, and reduce skill mismatch in the labour market. Future research is encouraged to empirically test the proposed framework across contexts and explore additional factors such as trust, ethics, and cultural influences.

In conclusion, motivation meets technology when AI adoption in higher education is driven not only by efficiency but also by meaningful, student-centred learning experiences. This integrated SDT–TAM framework provides a valuable foundation for advancing both theory and practice in AI-enabled education.

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References

[1] AbuSahyon, Alia Sa'ad Eldin, Abdelhadi Alzyoud, Omar Alshorman, and Basim Al-Absi. "AI-driven technology and chatbots as tools for enhancing English language learning in the context of second language acquisition: A review study." *International Journal of Membrane Science and Technology* 10, no. 1 (2023): 1209-1223. https://doi.org/10.15379/ijmst.v10i1.2829.

[2] Alharbi, Ali H. "Investigating the acceptance and use of massive open online courses (MOOCs) for health informatics education." *BMC Medical Education* 23, no. 1 (2023): 656. https://doi.org/10.1186/s12909-023-04648-9.

[3] Annamalai, Nagaletchimee, Mohd Elmagzoub Eltahir, Samer H. Zyoud, Deepa Soundrarajan, Bilal Zakarneh, and Najeh Rajeh Al Salhi. "Exploring English language learning via Chabot: A case study from a self determination theory perspective." *Computers and Education: Artificial Intelligence* 5 (2023): 100148. https://doi.org/10.1016/j.caeai.2023.100148.

[4] Avello-Sáez, Daniela, and Leonardo Estrada-Palavecino. "ChatGPT and its impact on competence training in occupational therapists: A reflection on academic integrity." *Cadernos Brasileiros de Terapia Ocupacional* 31 (2023): e3534. https://doi.org/10.1590/2526-8910.ctoen271035342.

[5] Bagozzi, Richard P., Fred D. Davis, and Paul R. Warshaw. "Development and test of a theory of technological learning and usage." *Human relations* 45, no. 7 (1992): 659-686. https://doi.org/10.1177/001872679204500702.

[6] Benbasat, Izak, and Henri Barki. "Quo vadis TAM?." *Journal of the association for information systems* 8, no. 4 (2007): 7. https://doi.org/10.17705/1jais.00126.

[7] Cortez, Patrick M., Ardvin Kester S. Ong, John Francis T. Diaz, Josephine D. German, and Singh Jassel Satwant Singh Jagdeep. "Analyzing Preceding factors affecting behavioral intention on communicational artificial intelligence as an educational tool." *Heliyon* 10, no. 3 (2024). https://doi.org/10.1016/j.heliyon.2024.e25896.

[8] Dağtekin, Ezgi, and Ercan Erkalkan. "Psychological Factors Influencing University Students Trust in AI-Based Learning Assistants." *arXiv preprint arXiv:2512.17390* (2025). https://doi.org/10.48550/arxiv.2512.17390.

[9] Dahri, Nisar Ahmed, Waleed Mugahed Al-Rahmi, Khadijah Amru Alhashmi, and Farhan Bashir. "Enhancing Mobile Learning with AI-Powered Chatbots: Investigating ChatGPT's Impact on Student Engagement and Academic Performance." *International Journal of Interactive Mobile Technologies* 19, no. 11 (2025).https://doi.org/10.3991/ijim.v19i11.54643.

[10] Davis, Fred D. "Perceived usefulness, perceived ease of use, and user acceptance of information technology." *MIS quarterly* 13, no. 3 (1989): 319-340.https://doi.org/10.2307/249008.

[11] Duong, Cong Doanh, Trong Nghia Vu, and Thi Viet Nga Ngo. "Applying a modified technology acceptance model to explain higher education students' usage of ChatGPT: A serial multiple mediation model with knowledge sharing as a moderator." *The International Journal of Management Education* 21, no. 3 (2023): 100883.https://doi.org/10.1016/j.ijme.2023.100883.

[12] Esiyok, Elif, Sahin Gokcearslan, and Kemal Gurkan Kucukergin. "Acceptance of educational use of AI chatbots in the context of self-directed learning with technology and ICT self-efficacy of undergraduate students." *International Journal of Human–Computer Interaction* 41, no. 1 (2025): 641-650. https://doi.org/10.1080/10447318.2024.2303557.

[13] Essel, Harry Barton, Dimitrios Vlachopoulos, Albert Benjamin Essuman, and John Opuni Amankwa. "ChatGPT effects on cognitive skills of undergraduate students: Receiving instant responses from AI-based conversational large language models (LLMs)." *Computers and Education: Artificial Intelligence* 6 (2024): 100198. https://doi.org/10.1016/j.caeai.2023.100198.

[14] Freeman, Josh. "Student generative AI survey 2025." *Higher Education Policy Institute: London, UK* (2025).

[15] Gerstenberg, Rebecca, Emil Rosenlund Høeg, Jolene Van der Kaap-Deeder, and Marc Hassenzahl. "Applying self-determination theory to behavior change technologies: insights from two projects in the health domain." *Frontiers in Psychology* 16 (2025): 1634267. https://doi.org/10.3389/fpsyg.2025.1634267.

[16] Hill, Richard J., Martin Fishbein, and Icek Ajzen. 1977. "Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research." *Contemporary Sociology a Journal of Reviews* 6 (2): 244. https://doi.org/10.2307/2065853.

[17] Hussain, Abid, Ma Zhiqiang, Mingxing Li, Arif Jameel, Shahida Kanwel, Saif Ahmad, and Bailin Ge. "The mediating effects of perceived usefulness and perceived ease of use on nurses' intentions to adopt advanced technology." *BMC nursing* 24, no. 1 (2025): 33. https://doi.org/10.1186/s12912-024-02648-8.

[18] Jamaluddin, Fadhilah, Ahmad Hakiim Jamaluddin, Faridzah Jamaluddin, and Faathirah Jamaluddin. "Malaysia's AI-Driven Education Landscape: Policies, Applications, and Comparative Insights for a Digital Future." *arXiv preprint arXiv:2509.21858* (2025). https://doi.org/10.48550/arxiv.2509.21858.

[19] Jobstreet by SEEK. "New Report: Malaysia's High Adoption of Generative AI Signals a Future-Ready Workforce, Despite Employee Concerns over Job Security and Reliability." May 15, 2024. https://my.jobstreet.com/about/news/article/decoding-global-talent-ai-2024.

[20] Khairuddin, Zulaikha, Nor Syahiza Shahabani, Siti Nurshafezan Ahmad, Azrin Raimi Ahmad, and Nur Adibah Zamri. "Students' perceptions on the artificial intelligence (AI) tools as academic support." *Malaysian Journal of Social Sciences and Humanities (MJSSH)* 9, no. 11 (2024): e003087-e003087. https://doi.org/10.47405/mjssh.v9i11.3087.

[21] Khalkho, Rachel, Savita Singh, Nidhi Gupta, and Prateek Srivastava. "Impact of educational AI on students' studying habits and academic performance." In *2024 International Conference on Artificial Intelligence and Quantum Computation-Based Sensor Application (ICAIQSA)*, pp. 1-6. IEEE, 2024. https://doi.org/10.1109/icaiqsa64000.2024.10882178.

[22] Lee, Yen-Fen, Gwo-Jen Hwang, and Pei-Ying Chen. "Impacts of an AI-based cha bot on college students' after-class review, academic performance, self-efficacy, learning attitude, and motivation." *Educational technology research and development* 70, no. 5 (2022): 1843-1865. https://doi.org/10.1007/s11423-022-10142-8.

[23] Liu, Tingyu, Yizhou Zhang, Mengze Zhang, Min Chen, and Shangchun Yu. "Factors influencing consumer willingness to use AI-driven autonomous taxis." *Behavioral Sciences* 14, no. 12 (2024): 1216.https://doi.org/10.3390/bs14121216.

[24] Manolică, Adriana, Olga Bucătaru, Cristina Teodora Roman, Patricea Elena Bertea, and Alexandra Raluca Jelea. "Adoption of AI in Digital Marketing: Comparing Gen Z and Gen Y through the Technology Acceptance Model." *BRAIN. Broad Research in Artificial Intelligence and Neuroscience* 16, no. 3 (2025): 102-128. https://doi.org/10.70594/brain/16.3/9.

[25] Masrek, Mohamad Noorman, Tri Susantari, Fitri Mutia, Helmi Prasetyo Yuwinanto, and Ragil Tri Atmi. "Enabling Education Everywhere: How artificial intelligence empowers ubiquitous and lifelong learning." *Environment-Behaviour Proceedings Journal* 9, no. SI18 (2024): 57-63. https://doi.org/10.21834/e-bpj.v9isi18.5462.

[26] Ministry of Education Malaysia. 2015. *Malaysia Education Blueprint 2015–2025 (Higher Education)*. Putrajaya: Ministry of Education Malaysia. https://www.moe.gov.my.

[27] Mosavi, Amir, Felde Imre, and VO Trung Hung. "ChatGPT and large language models in healthcare; a bibliometrics analysis and review." In *2024 IEEE 11th International Conference on Computational Cybernetics and Cyber-Medical Systems (ICCC)*, pp. 1-6. IEEE, 2024. https://doi.org/10.1109/ICCC62278.2024.10582937

[28] Peng, Shiqing, and Ziying Qiu. "Exploring the key factors influencing digital literacy development in primary school students: Insights from the UTAUT and SDT." In *2025 International Symposium on Educational Technology (ISET)*, pp. 292-297. IEEE, 2025. https://doi.org/10.1109/iset65607.2025.00064.

[29] Radanliev, Petar. "Artificial intelligence: reflecting on the past and looking towards the next paradigm shift." *Journal of Experimental & Theoretical Artificial Intelligence* 37, no. 7 (2025): 1045-1062. https://doi.org/10.1080/0952813x.2024.2323042.

[30] Ryan, Richard M., and Edward L. Deci. "Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions." *Contemporary educational psychology* 61 (2020): 101860. https://doi.org/10.1016/j.cedpsych.2020.101860.

[31] Ryan, Richard M., and Edward L. Deci. "Intrinsic and extrinsic motivations: Classic definitions and new directions." *Contemporary educational psychology* 25, no. 1 (2000): 54-67. https://doi.org/10.1006/ceps.1999.1020.

[32] Sallam, Malik, Amal Irshaid, Johan Snygg, Rula Albadri, and Mohammed Sallam. "Rapid Evolution of Large Language Models in Medical Education: Comparative Performance of ChatGPT-3.5, ChatGPT-5, and DeepSeek on Medical Microbiology MCQs." *Contemporary Education and Teaching Research* 6 (2025): 295-309. https://doi.org/10.61360/bonicetr252018770801.

[33] Sitanaya, Ivan Handryks, Devyano Luhukay, and Dicky Hida Syahchari. "Digital Education Revolution: Analysis of ChatGPT's Influence on Student Learning in Jakarta." In *2024 IEEE International Conference on Technology, Informatics, Management, Engineering and Environment (TIME-E)*, vol. 5, pp. 69-73. IEEE, 2024.https://doi.org/10.1109/time-e62724.2024.10919765.

[34] Solihati, Tri Agustini, Laily Rahmatika, M. Monjurul Islam, and Sigit Haryanto. "Understanding EFL Students' Adoption of Generative AI for English Learning: An Integrated UTAUT2 Model and Self-Determination Theory." *Online Learning* 29, no. 4 (2025): 311-340. https://doi.org/10.24059/olj.v29i4.5129.

[35] Soomro, Suhaib Ahmed, and Yusuf Olatunji Habeeb. "Impact of perceived ease of use on impulsive buying behaviour through mobile commerce with hedonic and utilitarian effects." *Asia-Pacific Journal of Business Administration* 17, no. 3 (2025): 796-813. https://doi.org/10.1108/apjba-11-2023-0563.

[36] Su, Chien-Yuan, and Cheng-Huan Chen. "Investigating university students' attitude and intention to use a learning management system from a self-determination perspective." *Innovations in Education and Teaching International* 59, no. 3 (2022): 306-315. https://doi.org/10.1080/14703297.2020.1835688.

[37] Tandon, Urvashi, Mohit Taneja, and Amit Mittal. "AI in the field of healthcare: a new paradigm examining facilitators and biases through SEM-ANN." *International Journal of Human–Computer Interaction* (2024): 1-17. https://doi.org/10.1080/10447318.2024.2375702.

[38] Venkatesh, Viswanath, James YL Thong, and Xin Xu. "Consumer acceptance and use of information technology: Extending the Unified Theory of Acceptance and Use of Technology1." *MIS quarterly* 36, no. 1 (2012): 157-178.https://doi.org/10.2307/41410412.

[39] Wong, Xin Jian, and Farzana Parveen Tajudeen. "Factors affecting Employees' intention to work through the metaverse platform." *International Journal of Human–Computer Interaction* 41, no. 11 (2025): 7058-7075.https://doi.org/10.1080/10447318.2024.2388480.

[40] Yang, Hsi-Hsun. "The acceptance of AI tools among design professionals: Exploring the moderating role of job replacement." *International Review of Research in Open and Distributed Learning* 25, no. 3 (2024): 326-349. https://doi.org/10.19173/irrodl.v25i3.7811.

[41] Behaviour Through Mobile Commerce With Hedonic and Utilitarian Effects." Asia-Pacific Journal of Business Administration 17 (3): 796–813. https://doi.org/10.1108/apjba-11-2023-0563.