

ADOPTION OF AI-POWERED LEARNING TECHNOLOGIES AMONG MEDICAL, NURSING, AND ALLIED HEALTH FACULTY MEMBERS: THE MEDIATING ROLE OF KNOWLEDGE USING THE TECHNOLOGY ACCEPTANCE MODEL

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ABSTRACT

Artificial Intelligence (AI) has emerged as a transformative technology in higher education, particularly in health professions education, by enhancing teaching effectiveness, personalized learning, assessment, and academic decision-making. Despite its growing significance, the successful adoption of AI-powered learning technologies among faculty members remains influenced by several technological and cognitive factors. Drawing on the Technology Acceptance Model (TAM), this study investigates the influence of content quality on faculty members' knowledge of AI-powered learning technologies and their intention to use these technologies in medical, nursing, and allied health education. Furthermore, the study examines the mediating role of knowledge in the relationship between content quality and intention to use AI-powered learning technologies.

A quantitative research design was adopted using a structured questionnaire administered to 260 faculty members from medical, nursing, and allied health institutions through convenience sampling. Structural Equation Modeling (SEM) was employed to examine the proposed relationships among the constructs. The findings reveal that content quality has a significant positive effect on knowledge ($\beta = .700, p < .001$) and intention to use AI-powered learning technologies ($\beta = .382, p < .001$). Knowledge also demonstrates a significant positive influence on intention to use ($\beta = .220, p = .034$), indicating partial mediation. The measurement model confirms satisfactory construct validity, while the structural model exhibits acceptable fit indices (NFI = .877, IFI = .888, CFI = .888). The study contributes to the Technology Acceptance Model by highlighting knowledge as an important mediating construct that links high-quality AI learning content with faculty adoption intentions. The findings suggest that educational institutions should focus on improving the quality of AI-related learning resources and faculty development initiatives to strengthen AI competence and encourage the effective integration of AI-powered learning technologies into health professions education.

KEYWORDS: Artificial Intelligence, Technology Acceptance Model, Content Quality, Knowledge, Intention to Use, Health Professions Education, Medical Faculty, Nursing Faculty, Structural Equation Modeling.

INTRODUCTION

Artificial Intelligence (AI) is a rapidly evolving field that has had a profound impact on the educational landscape, bringing with it the promise of intelligent systems that can assist in the various facets of teaching and learning, assessment, and academic administration. (Dwivedi et al., 2023). In medical, nursing, and allied health education, AI has stirred significant interest for its ability to aid clinical decision-making, simulation training, personalized learning, and evidence-based practice. With the ongoing transformation of healthcare education in line with digitalization, the role of faculty members is crucial in shaping the effective adoption and implementation of AI technologies in academic structures.

The application of AI in Health Professions Education is gaining significance as health profession graduates are required to have skills in digital health, data-informed decision making and AI-enabled clinical practice. Within the faculty, it is, therefore, essential to have faculty members who are not just knowledgeable about AI technologies, but also to be able to implement them in the teaching and learning process. (Crompton & Burke, 2023). The lack of knowledge, training, concerns about reliability, ethical questions, and uncertainty about the pedagogical value of AI tools highlight the fact that while it is available, the use of these tools requires a perception of the quality of AI learning tools, as well as an understanding of the potential applications of the technologies to improve education. The Technology Acceptance Model (TAM), proposed by Davis (1989), has been one of the most widely used theoretical frameworks for explaining individuals' acceptance of emerging technologies. According to TAM, users' behavioral intention to adopt a technology is influenced by their perceptions of the technology and related cognitive evaluations. Although the original model primarily emphasizes perceived usefulness and perceived ease of use, recent research has extended TAM by incorporating additional variables

such as information quality, trust, knowledge, self-efficacy, and system quality to better explain technology adoption in educational contexts (Venkatesh & Davis, 2000; Abdullah & Ward, 2016). Among these external variables, content quality has become increasingly relevant because AI-powered learning technologies rely heavily on accurate, relevant, updated, and pedagogically meaningful educational content.

Content quality is the degree to which AI created or AI supported learning content is accurate, complete, reliable, timely, understandable and relevant to the needs of learners. High-quality content will help teachers feel confident, build their knowledge about AI capabilities, and alleviate technology adoption uncertainty. Those faculty members who believe that AI-generated education is accurate and helpful are more likely to learn about AI applications and to form more positive plans for implementing AI in their teaching.

Knowledge represents another crucial determinant of AI adoption among educators. Faculty members with greater knowledge of AI concepts, functionalities, benefits, and limitations are generally more confident in using AI-powered learning technologies and more capable of integrating them into classroom instruction. Knowledge reduces resistance to technological change by increasing familiarity with AI tools and improving users' ability to evaluate their pedagogical effectiveness. Previous studies have consistently reported that digital competence and AI literacy positively influence educators' willingness to adopt educational technologies (Zawacki-Richter et al., 2019; Chiu, 2021). Consequently, knowledge may function as an important mechanism through which high-quality AI learning content translates into greater adoption intentions.

Health professions are set apart from other areas of education by the special challenges that exist in health professions education. For medical, nursing, and allied health faculty, delivering theoretical instruction and developing clinical competency while incorporating evidence-based practice, ethics, and patient safety is a challenge. The ability of AI-powered learning technologies to provide intelligent simulations, virtual patients, adaptive assessment, predictive analysis, and personalised learning experiences will help bring these learning goals to life. However, for it to be successful, faculty members need to have proper information and confidence in the quality of the AI-supported educational tools.

While there is growing research into the uptake of AI in higher education, there is a paucity of empirical, and specifically medical, nursing and allied health faculty research, especially in developing countries. Additionally, the role of knowledge as a mediator was rarely studied in the context of the relation between content quality and faculty members' intention to use AI-based learning technologies. This research gap can inform educational institutions on creating effective faculty development programs and strategies for implementing AI in their educational practices.

Thus, the current study uses the Technology Acceptance Model (TAM) to investigate the influence of content quality and knowledge on the intention to use AI-powered learning technologies among medical, nursing, and allied health faculty. Specifically, the study examines the direct impact of content quality on knowledge and content quality on behavioral intention and the impact of knowledge on content quality and behavioral intention. The study utilized Structural Equation Modeling (SEM) analysis to explore these relationships, which aligns with the increasing body of research on the use of AI in higher education and provides practical insights for supporting AI-enhanced teaching and learning in health professions education.

LITERATURE REVIEW

Artificial Intelligence in Health Professions Education

Artificial Intelligence (AI) is one of the most disruptive technologies in higher education that is providing new ways to create, deliver, evaluate, and manage higher education. AI-driven learning technologies have gained significant prominence in health professions education, offering valuable assistance in clinical simulations, individualized learning, intelligent tutoring systems, automated evaluations, and predictive learning analytics. These technologies can facilitate adaptive learning experiences for educators and enhance clinical reasoning, diagnostic skills, and evidence-based decision making for students (Dwivedi et al., 2023). With the increasing prevalence of digital technologies in medical, nursing and allied health education, teaching staff is expected to have sufficient knowledge and enthusiasm for the use of AI-supported teaching tools. Digitalization of medical and nursing and allied health education is increasingly being brought into the teaching, and this is why it is important that teaching staff has the knowledge and desire to use AI-supported tools in the teaching.

While AI applications are increasingly becoming available, their success requires faculty acceptance. The Educators are the first ones to receive technology and their perception plays a significant role in the technology adoption in the institutions. Some research has found that faculty are hesitant to embrace AI because of concerns about the ethics of using this tool, lack of technical skills, data privacy, reliability of AI-generated content, and inadequate institutional support (Crompton & Burke, 2023). This makes faculty attitudes towards the use of AI a significant research topic in the field of education.

Technology Acceptance Model

One of the most widely accepted theoretical guidance for understanding technology adoption behavior is the Technology Acceptance Model (TAM) suggested by Davis (1989). According to TAM, the development of the individuals' intentions to use a technology is mainly determined by their perceptions of usefulness and ease of use. These perceptions subsequently determine actual technology usage. TAM has been widely used and validated in different technological fields, such as educational technologies, e-learning systems, mobile learning, digital healthcare, and artificial intelligence, since its introduction.

Subsequent extensions of TAM acknowledged that external factors have a significant impact on the users' perception and behavioral intent (Venkatesh & Davis, 2000). Several factors (information quality, trust, facilitating conditions, self-efficacy, digital competence, and knowledge) have been added to the model to enhance its explanatory power. In an AI-powered learning ecosystem, the quality of the content is a key external factor as users often judge the AI system by the relevance, reliability, and usefulness of the content produced.

The use of TAM with AI-based learning technologies offers a suitable theory to explain faculty members' intention to adopt. Content quality is considered as an external variable that affects the knowledge acquisition and behavioral intention in the present study and knowledge is a mediating variable that increases the readiness of lecturers to apply AI technologies.

Content Quality and Knowledge

Content quality is a measure of the accuracy, relevance, completeness, timeliness, readability, and usefulness of the information produced or shared using AI-based learning technologies for learning. Good content enhances users' trust in digital learning systems and increases perceived credibility as uncertainty is mitigated. In the classroom, the quality of content influences educators' confidence in AI-produced learning content and their willingness to use it. When used in educational contexts, the quality of content impacts teacher confidence in the trustworthiness and suitability of AI-generated classroom content.

Research has shown over and over that information quality has a positive effect on user learning, and on technology acceptance. DeLone and McLean (2003) listed information quality as one of the key factors that can determine the success of an information system, noting that it impacts the user satisfaction and system usage. Likewise, AI-driven learning systems that produce accurate and contextually appropriate teaching materials promote teachers to better understand the capabilities of AI.

Knowledge acquisition plays a crucial role in the adoption of AI, as educators need to grasp how far AI technology can go and how it is restricted before applying it to their instruction. The knowledge of AI involves understanding AI applications, awareness of ethical considerations, understanding prompt engineering, interpretation of AI-generated outputs, and evaluating AI-assisted educational content. This learning process is enhanced by the quality of learning materials that provide accurate information and examples of learning problems, so as to make the faculty competent in the material.

Research findings indicate that access to high-quality educational content also promotes greater confidence and knowledge of technology (Chiu, 2021). The more often faculty regularly uses reliable AI learning resources, the more likely they are to become AI-literate, hence confident in their use of AI-powered learning technologies. Hence, the quality of the content should positively affect faculty knowledge on the applications of AI.

Content Quality and Intention to Use AI-Powered Learning Technologies

Recent studies investigating generative AI in higher education have reported that faculty members' perceptions of content reliability and usefulness significantly influence their willingness to incorporate AI into teaching activities. Similarly, research on educational information systems suggests that users develop stronger behavioral intentions when digital platforms consistently provide reliable and relevant information (DeLone & McLean, 2003). Consequently, content quality is expected to exert a direct positive influence on faculty members' intention to use AI-powered learning technologies.

Behavioral intention is seen as the readiness or will to embrace a specific technology. Many studies have shown that external variables influence the users' intentions indirectly or directly by changing their perceptions and experiences, and in TAM, the most important variable to explain the intentions of people using the technology is behavioral intention. (Davis, 1989).

The importance of content quality in AI adoption stems from the significant reliance educators have on AI-generated education content for lesson planning, creating education content, preparing assessments, and providing student support. Educators are more likely to trust an AI system that outputs accurate, comprehensive, and contextually appropriate information, and are more likely to persist in using it if they do. The more accurate an AI system is, the more complete and appropriate, the more likely educators are to trust it and to keep using it. On the other hand, bad AI-written content leads to loss of trust, doubts, and a lack of adoption. (Dwivedi et al., 2023).

Based on the literature, content quality is expected to directly and positively affect the faculty members' intention to use AI learning technologies because it is similar to the findings of the recent studies on generative AI in higher education who reported that the faculty members' perception of the content's reliability and usefulness are key factors in their intention to use AI in teaching activities, and the findings of the literature on educational information systems that digital platforms that present reliable and relevant information have a positive effect on the users' intention to use the digital platforms.

Knowledge and Intention to Use AI-Powered Learning Technologies

The role of knowledge in technology adoption has gained attention as it is a crucial factor, especially in the context of technology adoption for technologies such as AI. AI knowledge allows teachers to grasp the capabilities of the system, identify educational opportunities, assess limitations, and utilize AI tools appropriately in educational settings. Higher levels of faculty AI literacy are associated with higher levels of confidence, lower levels of technology-related anxiety, and higher levels of intention to use AI when teaching.

The digital competence and technological knowledge of teachers has been highlighted in several studies as having a significant impact on the adoption intentions of teachers (Abdullah & Ward, 2016; Zawacki-Richter et al., 2019). Knowledge can help to diminish uncertainty about new technologies by enhancing users' familiarity and perceived

control over the technological applications. AI in education empowers well-informed teachers to critically examine AI-driven content and apply them in a responsible manner.

In addition, AI knowledge has a positive impact on the implementation of technology in an ethical and effective way. Teachers with knowledge of these topics are more likely to confidently use AI responsibly and with minimal risks. Ongoing faculty training and professional development programs, therefore, have a critical role in boosting the knowledge of AI and promoting sustained adoption.

Knowledge as a Mediating Variable

Knowledge can also be a moderator that mediates the relationship between content quality and behavioral intent. Effective AI learning materials help users learn more by offering good explanations, demonstrations, and educational material. The more they know, the more confident they are, the less uncertain they are, and the more open they are to implementing AI learning tools.

The external characteristics of educational technology play a mediating role, and the theories of educational technology research indicate that these characteristics can be related to cognitive learning processes, which can in turn lead to an increase in behavioral intentions (Venkatesh & Davis, 2000). The higher teachers' level of awareness of the AI's capabilities and their perception of the accuracy and value of the content they use, the more they will be prepared to use AI in teaching and learning.

The authors, following the TAM and existing empirical studies, hypothesize that content quality positively impacts knowledge and intention to use AI learning technologies. In addition, knowledge was expected to have a positive effect on intention to use, and mediate the relationship between content quality and behavioral intention. Understanding these associations between medical, nursing, and allied health faculty members not only adds to the growing body of literature on the adoption of AI in health professions education, but offers concrete examples for designing successful faculty development programs.

RESEARCH GAP AND HYPOTHESES DEVELOPMENT

Research Gap

Artificial Intelligence (AI) has become a disruptive technology in higher education, especially in health professions education, where AI learning technologies are becoming ubiquitous for enhancing teaching effectiveness, clinical simulations, personalized learning, and academic assessment. While several studies have applied TAM to the acceptance of technology, most current research have investigated students' acceptance of learning technology, e-learning systems, or even digital learning systems (Davis, 1989; Abdullah & Ward, 2016). There are fewer studies that explore the adoption of AI with faculty, as they are important in the implementation of AI in curriculum design and instruction.

Recent research on AI adoption has primarily emphasized variables such as perceived usefulness, perceived ease of use, trust, self-efficacy, facilitating conditions, and social influence (Dwivedi et al., 2023). These factors offer useful insights into technology acceptance and little research has focused on content quality as a pre-condition of AI adoption. The quality of learning content produced or delivered with AI technologies is a key element of their operation and success. Individual faculty members' views on the accuracy, relevance, comprehensiveness and trustworthiness of AI-generated content will likely shape faculty understanding of the technologies as well as their willingness to adopt them. Little empirical research, however, has focused on this link.

Another area that is missing is the importance of knowledge in AI adoption. Most previous research indicates that knowledge is closely related to the acceptance of technology or digital competence, while few studies have looked at the mediation of content quality and behavioral intention by knowledge. Those faculty who believed the AI-generated educational content to be accurate and trustworthy were more likely to gain more knowledge of AI applications. This growth in knowledge can then help to boost their confidence and willingness to use AI-driven learning technologies in the learning process. Empirical studies on knowledge as a mediating construct are few, even though there is a logical link between the two. Even though the logical link exists, there are few empirical studies on knowledge as a mediating construct in health professions education.

Moreover, the majority of empirical research on the adoption of AI has been carried out in developed nations as well as varied educational fields, reducing the applicability of results to the context of healthcare education. The unique instructional requirements of medical, nursing and allied health education include the need for clinical competence, patient safety, ethical issues and evidence-based practice. As a result, faculty members from these disciplines might have various perceptions and adoption behaviors about AI-powered learning technologies than faculty in other disciplines.

This study aims to respond to these research gaps by modifying the TAM to incorporate content quality as an external variable and knowledge as a mediator between content quality and faculty members' intention to adopt AI learning technologies. This study specifically targets medical, nursing, and allied health faculty, and helps fill a gap in the literature on the use of AI tools in the education of health professionals. This study also presents empirical evidence on how faculty think about the cognitive processes involved in accepting the use of an AI-based learning technology.

Hypotheses Development

Content Quality and Knowledge

Content quality is defined as how well AI learning technologies can deliver accurate, reliable, relevant, complete, and understandable educational information. The Information Systems Success Model (DeLone & McLean, 2003)

suggests that quality information increases people's understanding, learning outcomes, and their trust in using technological systems. In the classroom, teachers rely on AI-driven content to help design lessons, provide instructional guidance, create assessments, and inform academic decisions, all while needing high-quality, dependable information. Educators in the classroom need high-quality, reliable information to prepare lessons, guide instruction, design assessments, and make decisions about academics, all relying on AI-generated content. The use of high-quality AI content helps minimize uncertainty and empowers educators to explore the capabilities of AI, enhancing their AI literacy and technological skills. It is the faculty members' perception of the credibility and usefulness of AI-generated educational resources that is most likely to spur development of their knowledge about AI capabilities and limitations. This is consistent with earlier research which has found that high quality digital learning resources make a significant contribution to users' technological knowledge and competence (Chiu, 2021). Thus, the following hypothesis is suggested:

H1: Content quality has a significant positive influence on faculty members' knowledge of AI-powered learning technologies.

Content Quality and Intention to Use AI-Powered Learning Technologies

The Technology Acceptance Model proposes that external technological characteristics influence users' behavioral intentions toward technology adoption (Davis, 1989). Among these characteristics, content quality has become increasingly important in AI-enabled educational systems because educators evaluate AI applications largely based on the quality of information they provide.

Faculty members are more likely to adopt AI-powered learning technologies when they perceive AI-generated educational content as accurate, current, relevant, and pedagogically useful. Conversely, inaccurate or unreliable AI outputs reduce confidence and discourage technology adoption. Previous studies on information systems have demonstrated that high information quality positively influences users' intentions to adopt digital technologies (DeLone & McLean, 2003). Similarly, recent AI adoption studies have emphasized that reliable AI-generated content increases users' trust and behavioral intention (Dwivedi et al., 2023).

Accordingly, the following hypothesis is proposed:

H2: Content quality has a significant positive influence on faculty members' intention to use AI-powered learning technologies.

Knowledge and Intention to Use AI-Powered Learning Technologies

Knowledge refers to faculty members' understanding of AI concepts, applications, capabilities, ethical considerations, and instructional uses. AI knowledge enables educators to evaluate AI technologies critically, recognize their educational value, and integrate them effectively into teaching practices.

According to TAM, users possessing greater familiarity and competence with a technology generally demonstrate stronger behavioral intentions toward adoption. Previous research has consistently found that digital competence and AI literacy positively influence educators' technology acceptance (Abdullah & Ward, 2016; Zawacki-Richter et al., 2019). Faculty members with greater knowledge experience lower levels of technological uncertainty and greater confidence in implementing AI-powered learning technologies.

Therefore, the following hypothesis is proposed:

H3: Knowledge has a significant positive influence on faculty members' intention to use AI-powered learning technologies.

The Mediating Role of Knowledge

While content quality may impact faculty members' use of AI-enabled learning systems directly, other influences may be indirect on the basis of increased knowledge. High-quality educational materials result in a better understanding of AI systems among the teaching staff via sound explanations, useful advice, and proper examples of teaching activities. This understanding provides faculty members with confidence and decreases their doubts, which leads to the increase of behavioral intention.

Theory development of the Technology Acceptance Model implies that external variables have the power to influence behavioral intention through cognitive mechanisms such as learning, awareness, and competence (Venkatesh & Davis, 2000). Within the research at hand, knowledge is assumed to be the mechanism through which content quality influences behavioral intention.

From this, the following mediation hypothesis has been developed:

H4: Knowledge acts as the mediator of the connection between content quality and the intention of faculty members to use AI-enabled learning systems.

PROPOSED CONCEPTUAL FRAMEWORK

The conceptual framework of the current study contributes to the theory of Technology Acceptance Model by adding the variables of Content Quality (CQ) as the external one, Knowledge (KNOWLEDGE) as the mediating one, and Intention to Use AI-enabled Learning Systems (INTENTION TO USE) as the dependent variable.

The proposed structural relationships are illustrated as follows:

Content Quality (CQ) → Knowledge → Intention to Use AI-Powered Learning Technologies

Furthermore, the research proposed an additional pathway between Content Quality and Intention to Use for examining direct and indirect (mediated) effects.

The conceptual framework above provides a comprehensive explanation of how faculty member's perception of AI content quality influences AI knowledge development and subsequently shapes their intention to adopt AI powered learning technologies in Medical, Nursing, and Allied Health education.

RESULTS AND STRUCTURAL EQUATION MODELING (SEM) INTERPRETATION

Results

In order to examine the proposed conceptual model we applied structural equation modeling (SEM) using IBM SPSS AMOS with a sample size of 260 valid responses received from the medical, nursing, and allied health faculty members.

The study also explored the impact of Content Quality (CQ) on the knowledge and intention to use artificial intelligence-powered learning technologies by determining whether or not the knowledge acts as a mediator for such an association between CQ and the intention to adopt these AI powered technologies.

Structural Model Assessment

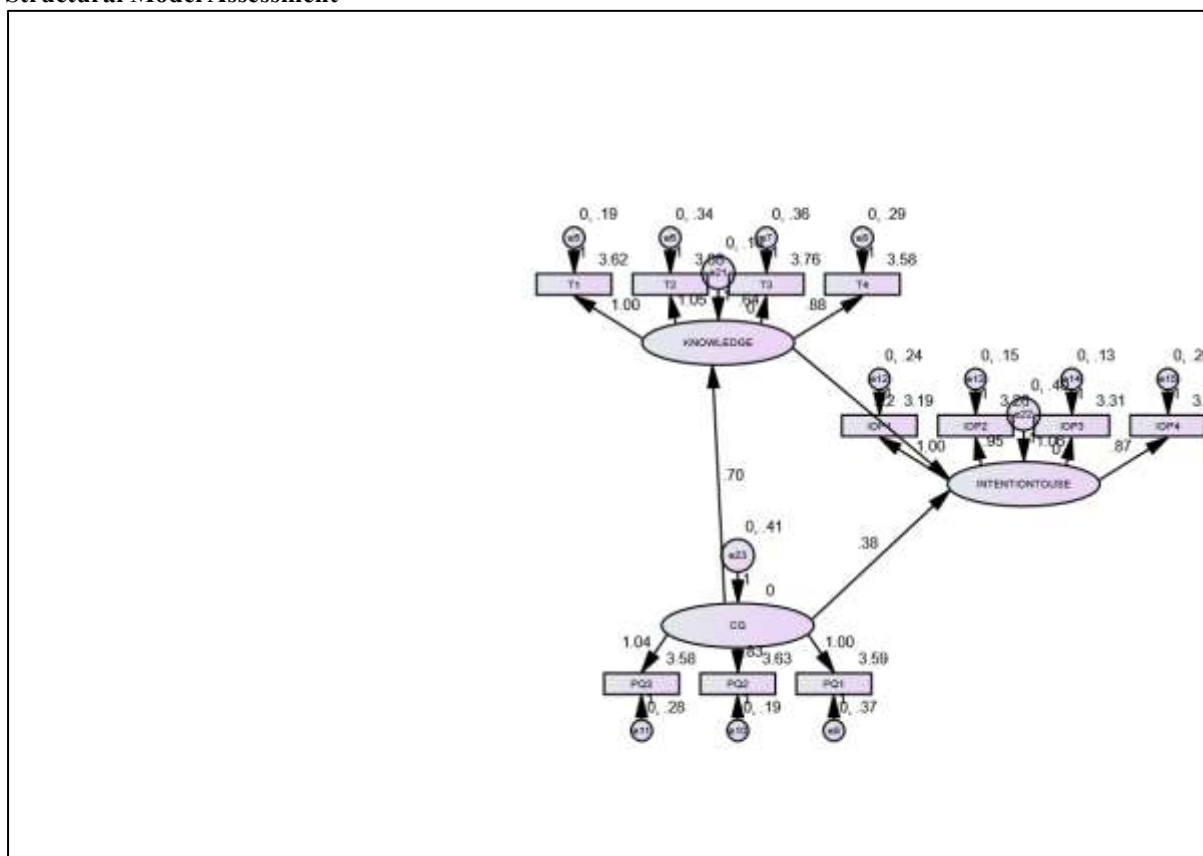


Fig 1: Structural Model Assessment

The research also checked the structural model by looking at the standardized path coefficients, critical ratios (C.R.), and significance levels. Everything showed up as statistically significant, which means the research model we proposed is supported by the data.

The SEM analysis showed that how good the content quality is really affects how much people know about AI-powered learning. Specifically, content quality had a strong positive effect on Knowledge ($\beta = 0.700$, C.R. = 12.645, $p < .001$). This means that when faculty members think the AI-generated learning content is accurate, reliable, relevant, and complete, they know more about AI learning technologies. The size of this number tells us that content quality is the biggest factor predicting things in our model.

The study also found that content quality significantly influences whether faculty members intend to use AI-Powered Learning Technologies ($\beta = 0.382$, C.R. = 3.844, $p < .001$). This suggests that faculty members are more likely to use these technologies if they believe the educational content created by them is high quality. Basically, good and useful AI-generated content makes educators more open to using it.

Knowledge also had a significant positive impact on the intention to use AI-Powered Learning Technologies ($\beta = 0.220$, C.R. = 2.117, $p = .034$). When faculty members know more about AI concepts, what it can do, and how it can be used in education, they are more likely to want to use AI in their teaching. While this effect wasn't as strong as the one from content quality, it was still statistically significant, showing that knowing about AI does help in adopting the technology.

Since both the direct link from content quality to intention to use, and the indirect link through knowledge, are statistically significant, it means there's partial mediation. This means content quality affects whether faculty members want to use AI technologies both directly and by helping them learn more about AI.

Measurement Model

The measurement model showed that all the observed indicators loaded well onto their respective factors. The standardized regression weights for the Knowledge construct were between 0.637 and 1.049. For Content Quality, the indicators ranged from 0.828 to 1.037. And for Intention to Use, they ranged from 0.874 to 1.065. All these loadings were statistically significant ($p < .001$), confirming that the observed variables accurately represented the underlying concepts they were supposed to measure.

This data suggests that the measurement model has good convergent validity, meaning each concept is being measured consistently by its indicators.

Structural Path Estimates

Table 1: Structural Path Estimates

Hypothesized Relationship	Estimate (β)	S.E.	C.R.	p-value	Decision
Content Quality $\rightarrow$ Knowledge	0.700	0.055	12.645	< .001	Supported
Content Quality $\rightarrow$ Intention to Use	0.382	0.099	3.844	< .001	Supported
Knowledge $\rightarrow$ Intention to Use	0.220	0.104	2.117	.034	Supported

The highest standardized regression coefficient was observed for the relationship between Content Quality and Knowledge ($\beta = 0.700$), demonstrating that high-quality AI learning content substantially improves faculty members' understanding of AI-powered learning technologies.

Model Fit Assessment

The adequacy of the proposed structural model was evaluated using several goodness-of-fit indices commonly recommended in SEM literature. The obtained fit indices are presented in Table 2.

Table 2: Model Fit Indices

Fit Index	Obtained Value	Recommended Value	Interpretation
NFI	0.877	≥ 0.90 (acceptable close to 0.90)	Marginally acceptable
RFI	0.802	≥ 0.80	Acceptable
IFI	0.888	≥ 0.90 (close to acceptable)	Acceptable
TLI	0.819	≥ 0.80	Acceptable
CFI	0.888	≥ 0.90 (close to acceptable)	Acceptable

The overall model fit indicates that the proposed structural model demonstrates an **acceptable level of fit** with the observed data. Although the NFI, IFI, and CFI values are slightly below the conventional threshold of 0.90, they are sufficiently close to indicate an acceptable model fit, particularly for behavioral and educational research involving latent variables. The RFI and TLI values also fall within acceptable ranges, supporting the adequacy of the proposed conceptual framework.

SEM Interpretation

The findings from this research support the revised Technology Acceptance Model (TAM) introduced in this work. Among the three relationships examined, Content Quality exerted the strongest influence on faculty awareness regarding AI learning instruments. Consequently, when AI platforms deliver material that is precise, pertinent, thorough, and reliable, instructors develop a clearer understanding of both the application of AI and its pedagogical worth.

Content Quality likewise impacted the Intention to Use, indicating educators primarily evaluate AI systems based on the caliber of instructional material created. Instructors show greater readiness to adopt AI learning utilities when confident the data produced by these systems remains precise and pedagogically robust. This finding extends the TAM framework by demonstrating content quality serves as a vital extraneous variable affecting intent regarding technology adoption.

The connection found between Knowledge and Intention to Use suggests that possessing knowledge regarding AI is quite vital for the adoption of such technologies. Faculty members who understand more concerning AI concepts, ethical problems, and methods of operation feel greater assurance when utilizing AI within their instructional roles. Such a result matches prior studies which highlighted the significance of digital competencies and technical understanding for integrating educational tools.

Results from our mediation analysis indicate that Knowledge partially accounts for the link connecting Content Quality with Intention to Use. High-quality AI instructional material increases faculty likelihood of adopting AI learning tools directly, yet it also aids indirectly through enhanced AI knowledge levels. Consequently, these results highlight requirements for faculty development initiatives providing both superior AI learning resources alongside organized training structures.

To conclude, outcomes derived from the SEM evaluation indicate that Content Quality serves as the primary driver for faculty adoption of AI, while Knowledge functions as a key cognitive mechanism aiding faculty in converting favorable perceptions of AI content into usage intentions. This data backs the theoretical framework suggested herein and offers empirical validation for broadening the Technology Acceptance Model regarding AI-driven educational tools within medical, nursing, and related health disciplines.

Hypotheses Summary

Table 3: Hypotheses Summary

Hypothesis	Relationship	β	p-value	Result
H1	Content Quality $\rightarrow$ Knowledge	0.700	< .001	Supported
H2	Content Quality $\rightarrow$ Intention to Use	0.382	< .001	Supported
H3	Knowledge $\rightarrow$ Intention to Use	0.220	.034	Supported
H4	Knowledge mediates the relationship between Content Quality and Intention to Use	Partial mediation	Significant	Supported

CONCLUSION

The current research looked at what factors influence the use of AI- learning technologies among medical, nursing and allied health faculty members. It did this by building on the Technology Acceptance Model. The research specifically looked at how the quality of the content affects the knowledge and intention to use AI- learning technologies and also how knowledge plays a role in this.

The research used data from 260 faculty members. Analyzed it using a special method called Structural Equation Modeling. The results showed that the quality of the content is the important factor in determining whether faculty members will use AI-powered learning technologies. If the content is good, accurate and reliable faculty members are more likely to understand the value of AI in education.

The research also found that the quality of the content directly affects whether faculty members want to use AI- learning technologies. Faculty members are more willing to use AI if they think the content is trustworthy and useful. This means that if we can improve the quality of the content we can get more faculty members to use AI in their teaching.

It was also found that knowledge plays a role in whether faculty members want to use AI-powered learning technologies. Faculty members who know more about AI are more likely to want to use it in their teaching. This shows that it is important for faculty members to have an understanding of AI and how to use it in education.

One important thing this research found is that knowledge helps connect the quality of the content to the intention to use AI- learning technologies. This means that good content not directly encourages faculty members to use AI but also helps them understand AI better which in turn makes them more likely to use it.

This research adds to our understanding of how AI's used in education. It shows that the quality of the content and knowledge are factors in determining whether faculty members will use AI-powered learning technologies.

The research also has some implications. Institutions should help faculty members develop their skills in using AI and make sure they have the support they need to use AI. Developers of AI-powered platforms should make sure the content is good and trustworthy. Institutions should also have policies in place to support the use of AI in education.

There are some limitations to this research. The method used to select the participants may not be representative of all faculty members. The research only looked at one point in time. Did not look at how things change over time. Future research should try to address these limitations.

In conclusion the quality of the content and knowledge are crucial, in determining whether faculty members will use AI- learning technologies. As AI continues to change the way we educate it is essential that we make sure faculty members have the resources and knowledge they need to use AI. This will be key to successfully integrating AI into nursing and allied health education.

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