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" Transforming University Education Through AI: The Autonomous University of Coahuila Experience"

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Abstract:- Artificial intelligence (AI) is increasingly integral to academic research at the Autonomous University of Coahuila. This study explores how AI transforms research methodologies, particularly focusing on its impact on the efficiency and quality of the resources it uncovers. The goal is to identify factors influencing the frequency of AI use, drawing from a case study at the Autonomous University of Coahuila, Mexico. The research is conducted in two phases using a five-point Likert scale for data collection. Results reveal that variables identified by the Technology Acceptance Model (TAM) significantly influence faculty adoption of AI. These variables include challenges such as lack of knowledge, insufficient training, resistance to change, and implementation barriers.

Keywords*:* Technology adoption, artificial intelligence, Education, TAM model, University.

1. Introduction

Intelligence, defined as a vast and deep mental capability, encompasses skills such as reasoning, planning, problem-solving, abstract thinking, understanding complex concepts, rapid learning, and learning from experiences (Arbeláez-Campillo, Villasmil Espinoza, & Rojas-Bahamón, vol. XXVII, no. 2, 2021). This ability illustrates proficiency in comprehending the environment, grasping the essence of matters, interpreting them effectively, and making wise decisions.

In the realm of education, digital tools are increasingly becoming essential in university settings (Guerrero and Cervera, 2012). The shift from traditional educational models to digital frameworks is driving innovation and fostering collaboration in developing new cultural domains. The academic community is encouraged to engage with environments enriched with digital communication and information resources (Morlan, 2010).

Reviews of current literature underscore the escalating significance of Artificial Intelligence (AI) in transforming education. Globally, exemplary cases demonstrate how AI enhances academic outcomes, customizes learning experiences, and provides immediate feedback. Nationally, efforts by the Mexican government aim to revamp the educational system, emphasizing the importance of collaboration among the government, educational institutions, and the tech industry for an effective and inclusive transformation.

This research aims to evaluate the degree of AI adoption at the Autonomous University of Coahuila, Torreón Campus, identifying the primary factors influencing adoption as defined by the Technology Acceptance Model (TAM) by Davis et al. (1989). The study seeks to determine the impact of the lack of knowledge and insufficient training of university instructors on their willingness to embrace AI. The proposed hypotheses are:

a) Greater training in AI among teachers is likely to lead to more effective pedagogical strategies.

b) Teachers' active engagement in AI training programs is expected to positively affect their readiness to adopt these technologies, influencing their usage and adoption.

To validate these hypotheses, a questionnaire adapted from the one used by Davis et al. (1989) was administered, utilizing a five-point Likert scale, at the Autonomous University of Coahuila, Torreón Campus.

2. State of the Art

Given the length constraints of articles in scientific publications, a concise assessment of the authors and works that form the theoretical and analytical basis of the paper is conducted. These contributors have not only underpinned the study but have also shaped the modern understanding of AI (Arbeláez-Campillo, Villasmil Espinoza, & Rojas-Bahamón, vol. XXVII, number 2, 2021).

Technological advancements have profoundly affected various areas, from education to politics and societal structures, modifying organizational and operational practices (Drucker, 2004). This technological and organizational evolution over the past decade has instigated significant changes in educational methods, promoting the exploration of new educational dissemination strategies.

Faced with rapid technological changes, universities are confronting numerous challenges. However, they are eager to utilize these advancements to broaden their knowledge bases and enhance educational practices.

In today's society, which is increasingly moving towards widespread technologization, all sectors are either adapting to or being transformed by technological advancements (Yolvi Ocaña-Fernández, May/Aug. 2019). In education, this means adapting to communities that interact through technology, raising critical questions about the extent to which technology can revolutionize education (Yolvi Ocaña-Fernández, May/Aug. 2019).

In response to the evolving educational needs brought about by these transformations, countries like the USA have integrated AI solutions in many academic settings. These solutions, structured within online platforms with tailored search algorithms, provide easier access to a broad spectrum of knowledge.

Thus, it is crucial to assess the integration level in academic institutions and identify the factors that define the usage patterns of AI. Consequently, ease of implementation and perceived utility are suggested as key factors influencing the adoption behavior among university students.

2.1 Dimensions of Artificial Intelligence Platforms Studies

The rise of technology and automation has introduced a new form of exclusion, distinguishing those with access to ICT from those without. Researchers have focused on the availability of educational resources and technological infrastructure at universities necessary for accessing digital media, emphasizing the creation of educational spaces and the enforcement of policies that ensure free access for the entire student body (Barón and Gómez, 2012).

In this field, the primary factors of study have been the automation of services and software development driven by technological shifts (Arriola and Butrón, 2008). However, simply implementing these technologies does not ensure their effective use (Domínguez, 2008; Lau, et al., 2000). Moreover, integrating AI into education poses ethical and practical issues, such as safeguarding student privacy, ensuring equitable access to these advanced technologies, and the necessity for a solid regulatory framework to guide their implementation.

Reflecting on Mexico's past experiences with educational technologies, valuable insights have been gained that will aid in planning and implementing AI integration into educational systems. These insights highlight the importance of strategic planning, continuous training for educators, and addressing potential challenges such as technological infrastructure and resistance to change. By leveraging these lessons, Mexico can effectively incorporate AI to enhance learning outcomes and foster a more adaptive and innovative educational environment.

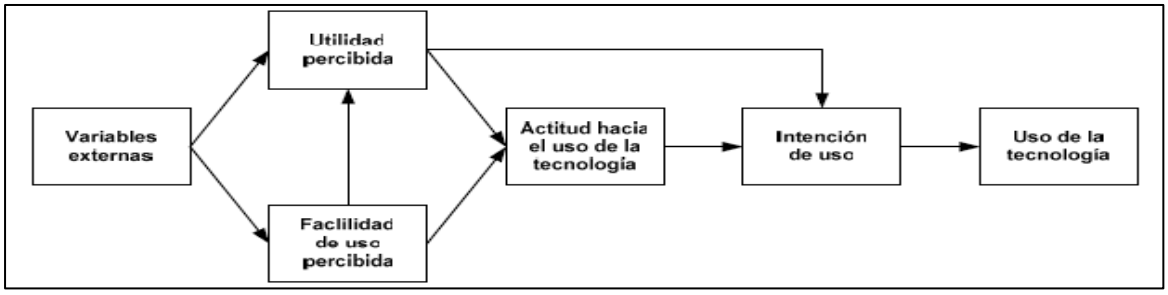

Fig. 1. Original Technology Acceptance Model
Source: Cataldo, (2015)

Numerous theoretical frameworks have significantly contributed to understanding technology acceptance, notably highlighting the Unified Theory of Acceptance and Use of Technology (UTAUT). This model identifies four primary factors that shape the intention to use technology: performance expectancy, effort expectancy, social influence, and facilitating conditions, which are moderated by age, gender, voluntariness of use, and prior experience with the technology (González, 2012).

Although various models exist, the Technology Acceptance Model (TAM) employed in this research effectively supports the proposed framework, identifying key variables driving the adoption process. Perceived usefulness is understood as the belief that using a particular system will enhance one's performance. In contrast, perceived ease of use refers to the degree of effort required to use the technology (Morlan, 2010).

The relationship between perceived ease of use and perceived usefulness indicates that technologies that are easier to use are generally considered more beneficial. This ease of use conserves effort, which can be allocated to other tasks, thereby increasing overall efficiency. Moreover, straightforward interactions with a system enhance a user's sense of capability or self-efficacy (Bravo and Valdivia, 2015; Morlan, 2010).

These factors also influence attitudes toward technology use, which reflect an emotional response indicating one's preference or aversion to using a specific system or platform. This attitude is shaped by both perceived usefulness and ease of use (Morlan, 2010). It is noted that both perceived usefulness and a positive attitude toward technology motivate the intention to use it, which in turn facilitates actual usage.

Hypotheses

The hypotheses developed for this study are grounded in the Technology Acceptance Model (TAM), exploring the connection between two factors:

H1. A lack of knowledge about artificial intelligence affects its adoption by impacting perceived ease of use.

H2. The level of training that teachers have in artificial intelligence affects their perception of the technology's utility.

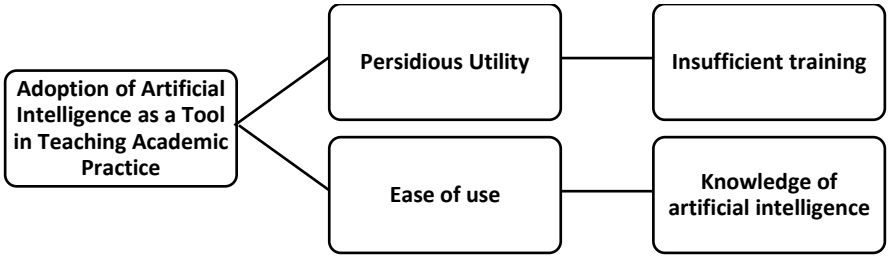

Fig. 2. Variables affecting the adoption of artificial intelligence.

Source: Own elaboration

Definition of Terms:

a) Lack of Knowledge: (H1) This refers to the absence of understanding regarding the fundamental concepts of artificial intelligence.

b) Insufficient Training: (H2) This highlights the lack of comprehensive training programs available for educators in artificial intelligence.

3. Methodology:

This research investigates the correlation between the adoption levels of artificial intelligence and its ease of use (specifically, familiarity with AI tools) and perceived utility (related to training provided to educators) at the Torreón Campus of the Autonomous University of Coahuila. The study focuses on the faculty, analyzing a case study within this educational institution, which boasts a staff of 354 professors across four distinct academic disciplines.

Data were gathered using a structured questionnaire, which was segmented into two sections containing a total of ten polytomous closed-ended questions, each scaled according to a five-point Likert system. This questionnaire was distributed to a carefully selected sample of the faculty.

4. Results:

The findings from the survey indicated that all surveyed members, accounting for the entire faculty population of 354, were aware of the existence of artificial intelligence tools.

	Knowledge of artificial intelligence (item 1 to 5)	Insufficient training (items 6 to 10)
Valid	354	354
Lost	0	0

Table 1. Applied Survey

Source: Own elaboration under SPSS

One of the metrics assessed in the survey was how frequently faculty at the Autonomous University of Coahuila utilize artificial intelligence tools. The data showed that a significant majority, 89.3%, of the participants rarely, if ever, use artificial intelligence tools, while the remaining 10.5% employ these tools about once a month. (Refer to Table 2),

Table 2).

Value	Use of artificial intelligence tools	Frequency	Percentage
5	3 times per week	0	0%
4	2 times per week	0	0%
3	1 time every two weeks	1	0%
2	1 time every month	37	10.5%

1	Rarely	316	89.3%
TOTAL		356	100%

Table 2. Frequency Table of Artificial Intelligence Tools Usage

Source: Own elaboration

5. Conclusions

H1: A deficiency in understanding the basics of artificial intelligence significantly affects its adoption by influencing how easy these tools are perceived to be used. The findings indicate that a lack of familiarity with AI tools could hinder their seamless integration, impacting teachers' perceptions of their accessibility and usefulness.

H2: The inadequate training of educators in artificial intelligence strongly correlates with how useful the technology is perceived. The data suggest that poor training may restrict the recognition and valuation of the benefits that AI can offer, thereby affecting its perceived utility within the educational framework.

Together, these conclusions underscore the vital need to address both the knowledge gap and training deficiencies in artificial intelligence to foster its successful adoption and positive reception among faculty at the Autonomous University of Coahuila, Torreón Campus. Adopting a comprehensive strategy for enhancing understanding and training is crucial to maximizing the effective implementation of AI in education.

Future Research Directions

Key areas to be explored in future studies include:

Resistance to Change in Adopting Artificial Intelligence

The deployment of AI technologies in education may encounter resistance due to perceived complexities of the technology, concerns about the displacement of traditional educational methods, and uncertainties regarding AI's impact on classroom dynamics. Future research could delve into the specific causes of this resistance, examining educators' perceptions, attitudes, and readiness to embrace this emerging technology. Moreover, evaluating the effectiveness of training programs aimed at mitigating resistance and fostering wider acceptance of AI in education would be beneficial.

Challenges in Implementing Artificial Intelligence

Implementing AI solutions effectively often demands substantial resources, including advanced hardware and specialized expertise. In education, frequent hurdles include inadequate technical infrastructure, limited access to high-quality data, and a scarcity of AI specialists. Investigating strategies to overcome these challenges, such as forming industry partnerships, offering specific training programs for educators, or adopting phased implementation approaches, could yield critical insights that enhance the successful integration of AI in educational settings.

Research in these domains will enhance our understanding of the elements that influence the acceptance and successful implementation of disruptive technologies in education, helping to formulate more informed and effective strategies.

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