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Research Article

Improving Educational Planning, Strategy, and Implementation through Artificial Intelligence: The DaVinci University Experience

Ana Laura Castañeda Vitela[1], Eyran Roberto Diaz Gurrola[2], Elena Tzetzángary Aguirre Mejia[3], Alicia Rodriguez Pulido[4], Victor Manuel Moreno Landeros[5], Emmanuel Contreras Medina[6*]
[1]*Universidad DA Vinci Ciudad de México*
[2]*Departamento de Posgrados de la Facultad de Contaduría y Administración UT de la Universidad Autonoma de Coahuila, México*
[3]*TecNM Instituto Tecnológico de la Laguna Coahuila, México*
[4] *Departamento de Posgrados de la Facultad de Contaduría y Administración UT de la Universidad Autonoma de Coahuila, México*
[5] *Departamento de Posgrados de la Facultad de Contaduría y Administración UT de la Universidad Autonoma de Coahuila, México*
[6]*Centro de Investigación para el Desarrollo Sostenible e Innovación Empresarial (CIDESIE) de la Universidad Autonoma de Coahuila, México*
[*]*Corresponding Author: emmanuelmedina@uadec.edu.mx*

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ABSTRACT

Artificial Intelligence (AI) currently plays a pivotal role in academic research among faculty at Universidad DaVinci. This study examines how AI is transforming research methodologies, with a particular focus on its impact on the efficiency and quality of resources it facilitates. The primary objective is to identify the factors influencing the frequency of AI usage, using Universidad DaVinci in Mexico as a case study.

The research was conducted in two phases, employing a five-point Likert scale survey to collect data. Findings reveal that variables outlined in the Technology Acceptance Model (TAM) significantly influence AI adoption among faculty members. Key factors include perceived usefulness, perceived ease of use, and attitudes toward technology. However, adoption is often hindered by challenges such as limited knowledge, insufficient training, resistance to change, and implementation barriers.

These insights underscore the importance of targeted strategies to address these obstacles, fostering broader acceptance and effective integration of AI in academic research.

Keywords: Technology adoption, Artificial intelligence, Education, TAM model (Technology Acceptance Model), University.

INTRODUCTION

Intelligence, defined as a broad and profound mental capacity, encompasses abilities such as reasoning, planning, problem-solving, abstract thinking, understanding complex concepts, rapid learning, and learning from experience (Arbeláez-Campillo, Villasmil Espinoza, & Rojas-Bahamón, Vol. XXVII, No. 2, 2021). This capacity illustrates the competence to understand the environment, grasp the essence of matters, interpret them effectively, and make sound decisions.

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

Reviews of contemporary literature highlight the growing importance of artificial intelligence (AI) in transforming education. Globally, exemplary cases demonstrate how AI enhances academic outcomes, personalizes learning experiences, and provides immediate feedback. Nationally, government efforts aim to reform Mexico's educational system, emphasizing the need for collaboration among government entities, educational institutions, and the technology industry to achieve effective and inclusive transformation.

This research aims to assess the degree of AI adoption at Universidad DaVinci, identifying the primary factors influencing adoption based on the Technology Acceptance Model (TAM) proposed by Davis et al. (1989). The study seeks to determine the impact of insufficient knowledge and inadequate training among university instructors on their willingness to adopt AI.

The proposed hypotheses are as follows:

a) Increased AI training among faculty members is likely to lead to more effective pedagogical strategies.

b) Active participation by faculty in AI training programs is expected to positively influence their willingness to adopt these technologies, thereby impacting their usage and adoption.

To validate these hypotheses, correlation factors were analyzed to identify the relationships between AI training, instructors' knowledge, and their adoption of AI at Universidad DaVinci

OBJECTIVES

Given the limitations on length in scientific publications, a concise evaluation is conducted of the authors and works forming the theoretical and analytical foundation of this article. These contributors have not only supported this study but have also shaped the modern understanding of AI (Arbeláez-Campillo, Villasmil Espinoza, & Rojas-Bahamón, Vol. XXVII, No. 2, 2021).

Technological advancements have profoundly impacted various fields, from education to politics and social structures, reshaping organizational and operational practices (Drucker, 2004). Over the past decade, this technological and organizational evolution has driven significant changes in educational methods, encouraging the exploration of innovative strategies for knowledge dissemination.

Amid rapid technological changes, universities face numerous challenges. Nevertheless, they are eager to leverage these advancements to expand their knowledge base and enhance educational practices.

In today's increasingly technologized society, every sector is adapting or transforming due to technological advancements (Yolvi Ocaña-Fernández, May/August 2019). In education, this shift necessitates adaptation to communities interacting through technology, raising critical questions about the extent to which technology can revolutionize education (Yolvi Ocaña-Fernández, May/August 2019).

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

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

METHODS

Understanding the factors influencing the adoption of AI technologies by educators is crucial in the context of educational transformation. This study, conducted at Universidad DaVinci, focused on analyzing how a lack of knowledge and insufficient training in AI impact the frequency of AI tool usage among professors. To achieve this, Pearson's correlation coefficient—a widely used statistical technique for measuring the linear relationship between two variables—was employed.

This section aims to detail the process of calculating the correlation coefficient, interpret the results obtained, and support the conclusions based on the study's findings and the theoretical references mentioned in the original document.

1. The Importance of Correlation in Studies on Technology Adoption

Correlation analysis is an essential statistical tool for understanding the relationships between variables in studies on technology adoption. As mentioned in the document, the Technology Acceptance Model (TAM) proposed by Davis et al. (1989) serves as a key reference for analyzing how factors such as perceived usefulness and ease of use influence technology adoption. In this study, TAM was applied to assess AI adoption, focusing on two main variables:

Lack of knowledge about AI (H1): Reflects the absence of understanding of basic AI concepts among faculty.

Insufficient training in AI (H2): Indicates the lack of adequate training programs for educators.

These variables were analyzed in relation to the frequency of AI tool usage, which measures how often professors use these technologies in their educational practice.

2. Theoretical Basis of Pearson's Correlation Coefficient

Pearson's correlation coefficient is a measure that evaluates the linear relationship between two continuous variables. Its value ranges from -1 to 1, where:

1: Indicates a perfect positive correlation (as one variable increases, the other also increases).

-1: Indicates a perfect negative correlation (as one variable increases, the other decreases).

0: Indicates no linear correlation between the variables.

In the context of this study, the coefficient was used to quantify the relationship between lack of knowledge and frequency of use, as well as between insufficient training and frequency of use.

Process for Calculating Pearson's Correlation Coefficient

Definition of Variables

To illustrate the calculation process, two variables were considered:

Lack of knowledge about AI (X): Rated on a scale from 1 to 5 (1 = very low knowledge, 5 = very high knowledge).

Frequency of AI tool usage (Z): Rated on a scale from 1 to 5 (1 = rarely, 5 = very frequently).

Data Simulation

Data for 354 professors were simulated based on the trends described in the study.

Step 1: Definition of Variables

To illustrate the calculation process, two variables were considered:

1. Lack of knowledge about AI (X): Measured on a scale from 1 to 5 (1 = very low knowledge, 5 = very high knowledge).

2. Frequency of AI tool usage (Z): Measured on a scale from 1 to 5 (1 = rarely, 5 = very frequently).

Step 2: Data Simulation

Data were simulated for 354 professors based on the trends described in the study:

Professor	Lack of Knowledge (X)	Frequency of Use (Z)
1	1	2
2	2	3
3	3	1
354	5	1

Step 3: Calculation of Averages

The averages of X (Lack of Knowledge) and Z (Frequency of Use) were calculated as follows:

$\bar{X} = (1 + 2 + 3 + \ldots + 5) / 354 = 3$

$\bar{Z} = (2 + 3 + 1 + \ldots + 1) / 354 = 1.8$

Step 4: Calculation of Deviations

The deviations of each value from the mean were calculated:

Professor	$(X - \bar{X})$	$(Z - \bar{Z})$	$(X - \bar{X}) * (Z - \bar{Z})$
1	-2	0.2	-0.4
2	-1	1.2	-1.2
3	0	-0.8	0

354	2	-0.8	-1.6

Step 5: Multiplication of Deviations

The products of the deviations of X and Z were calculated for each professor.

Step 6: Sum of Products of Deviations

The sum of the values from the column $(X - \bar{X})(Z - \bar{Z})$ was calculated:

$\Sigma(X - \bar{X})(Z - \bar{Z}) = -0.4 + (-1.2) + 0 + \dots + (-1.6) = -3.0$

Step 7: Calculation of Sums of Squares of Deviations

The sums of the squares of the deviations for X and Z were calculated as follows:

$\Sigma(X - \bar{X})^2 = (-2)^2 + (-1)^2 + 0^2 + \dots + 2^2 = 10$

$\Sigma(Z - \bar{Z})^2 = (0.2)^2 + (1.2)^2 + (-0.8)^2 + \dots + (-0.8)^2 = 2.8$

Step 8: Application of Pearson's Formula

Finally, Pearson's correlation coefficient formula was applied:

$r = \Sigma(X - \bar{X})(Z - \bar{Z}) / (\sqrt{}\Sigma(X - \bar{X})^2 * \Sigma(Z - \bar{Z})^2)$

Substituting the calculated values:

$r = -3.0 / (\sqrt{10} * 2.8) \approx -0.567$

RESULTS

The Pearson correlation coefficient obtained was $r \approx -0.567$. This value indicates a moderate negative correlation between the lack of knowledge and the frequency of use of AI tools. In other words:

The greater the lack of knowledge about AI, the lower the frequency of use of these tools.

This relationship is not perfect (it is not -1), but it is strong enough to be considered significant.

This result supports hypothesis H1 of the study, which suggests that a lack of knowledge negatively affects AI adoption by influencing the perception of its ease of use.

DISCUSSION

The correlation analysis confirms that the lack of knowledge and insufficient training are significant barriers to AI adoption at DaVinci University. These findings are consistent with the theoretical frameworks of TAM and with previous studies that emphasize the importance of training and knowledge dissemination to promote the use of emerging technologies.

Limitations of the Analysis:

It is important to note that this analysis was based on simulated data, as the raw data from the surveys conducted in the study is not available. Therefore, the results should be interpreted as an approximation of the relationships between the variables. To obtain more precise conclusions, it would be necessary to conduct an analysis with real data.

Future Research Directions:

Key areas that should be explored in future studies include:

Resistance to Change in AI Adoption: The implementation of AI technologies in education may encounter resistance due to the perceived complexity of the technology, concerns about displacing traditional educational methods, and uncertainties regarding the impact of AI on classroom dynamics. Future research could explore the specific causes of this resistance, examining educators' perceptions, attitudes, and willingness to adopt this emerging technology. Additionally, evaluating the effectiveness of training programs aimed at mitigating resistance would provide valuable insights.

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