Mechanisms for Applying Artificial Intelligence at the Faculty of Physical Education in Light of Faculty staff's Attitudes Towards Digital Transformation According to Egypt's Vision 2030

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Abstract :

The research aims to explore the mechanisms for applying artificial intelligence (AI) at the Faculty of Physical Education, Mansoura University, in light of faculty staff's attitudes toward digital transformation according to Egypt's Vision 2030. Using the descriptive method, a simple random of (76) faculty members from the 2022/2023 academic year was selected. The results showed a lack of awareness about (AI) concepts and applications among many faculty staff, despite recognizing the importance of expanding digital transformation in response to societal challenges. Financial constraints hinder the purchase of necessary devices and software for (AI) implementation as well. Additionally, the existing legislative framework and internal regulations do not support the effective application of (AI) systems. However, there is a positive attitude towards digital transformation, which can facilitate the implementation of (AI) in education.

Research introduction:

The world has experienced rapid technological and scientific advancements, which have directly and indirectly impacted daily life. Among these advancements is artificial intelligence (AI), which has become integral to various fields. In higher education, (AI) applications are essential to keep pace with technological changes. Since higher education is a key pillar for national development, it plays a significant role in enhancing society's knowledge through teaching, research, and community service.

The concept of the "smart institution" is central to modern management, and faculties of physical education must evolve in line with Egypt's Vision 2030. They must adapt to technological changes and leverage their resources to increase efficiency and competitiveness in managing information systems. Artificial intelligence, which enables computers to simulate human intelligence, is a crucial tool for solving problems and making decisions, and should be incorporated into the educational process to meet the demands of the future.

Faten Hassan Al-Yajzi (2019) highlights that technology has greatly impacted the education sector, with

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internet research and tablets replacing books in universities. However, these advancements may soon be overshadowed by the rise of artificial intelligence, which is expected to bring unprecedented changes. Until recently, humans used machines to handle physically or mentally demanding tasks while retaining control.(7:268)

Goksel and Bozkurt (2019) define artificial intelligence as computer programs that simulate human cognitive abilities, such as learning, making inferences, and responding to unprogrammed situations. AI aims to develop systems that match or exceed human intelligence, helping humans solve new problems in their daily lives.(15:236)

Erb, B. (2016) indicates that (AI) educational programs are designed to address the learning needs of different student groups and objectives. These programs connect students, provide access to digital resources, and engage them in the learning process in diverse ways.(14:47)

Luckin (2017) highlights that educational institutions are adopting artificial intelligence to enhance students' skills and prepare them for society. The focus should be on helping students understand the integrated world of (AI). (16:361)

Luckin et al. (2016) stress the importance of adapting to global changes and seeking modern solutions to maintain educational stability. (AI) applications are increasingly used in education, improving systems, supporting students' adaptation to technological changes, and effectively managing the learning process by optimizing course distribution and providing easy access to digital resources. (17: 1-16)

Sabah Eid and Raja'a Al-Subhi (2020), Borge, N. (2016), and Woolf et al. (2013) agree that educational systems aim to integrate (AI) into learning through modern technologies, helping students adapt to technological changes.(AI) applications transform the teacher’s role, affecting assessment, grading, question delivery, and providing feedback. They also support the shift towards active learning. (4:325)(13:163)(20:51)

Sabah Eid and Raja'a Al-Subhi (2020) emphasize that successful (AI) implementation in universities depends on focusing on factors like technology development, human resource management, and work procedures to improve service quality and avoid increasing manual work burdens. (4:329)

Amani Abdel Qader Mohamed Shaaban (2021) highlights that, despite efforts by Egypt's Ministry of Higher Education to enhance university efficiency and quality through the adoption of information and communication technology (ICT), and various development projects, the actual

situation at Egyptian universities, especially at the Faculty of Physical Education at Mansoura University, shows weaknesses in these efforts. Digital transformation has gained significant attention both locally and globally, particularly after the COVID-19 pandemic, and is a key focus of Egypt's 2030 strategy to drive progress in all sectors.(2:16)

Mohammed bin Nasser Al-Ibrahim (2020) emphasizes that faculty staff face challenges working with limited resources, and universities should establish qualified technology staff to help them manage modern technology without adding extra burdens (9: 128).

Abdulrahman bin Fahd Al-Mutrif (2020) highlights that universities must develop clear policies for digital transformation, considering their specific needs, infrastructure, and goals for integrating the internet into learning. A detailed plan should be created to manage the project, including the program, student services, and staff competence in using technology (5: 172).

Mona Farhat Ibrahim Shahtata (2021) highlights that attitudes are key to shaping behavior and are crucial in both social and educational contexts. Positive attitudes toward aspects of education, such as teachers and teaching methods, lead to desirable outcomes, while negative attitudes hinder progress. Many studies focus on changing negative attitudes to improve educational processes (12: 473).

Ahmed Gamal Mohammed (2021) and Lina Bint Ahmed Bin Khalil Al-Farani (2021) emphasize that positive attitudes drive personal and professional success, helping individuals overcome challenges, while negative attitudes foster frustration and failure (1: 480) (8: 38).

The research highlights the growing emphasis on applying artificial intelligence in the digital era, as seen in global and local trends. It underscores the need for faculty members to develop their digital culture and skills for professional development, particularly in the context of the shift to digital education. Faculty must enhance their digital knowledge and effectively use technology to contribute to community development.

Research problem:

Artificial intelligence (AI) technologies are rapidly advancing globally, particularly in improving educational outcomes. However, challenges hinder their integration into education, such as insufficient infrastructure and the lack of a clear vision for AI implementation in Egypt’s educational system. Despite the urgent need for (AI) in education, it remains underdeveloped in Egypt. According to Fatimah Hassan Al-Yajzi's 2019 study, AI faces issues like weak decision-making support in the Ministry of Higher Education, a lack of

qualified technical expertise, and faculty resistance to adopting AI in the education process.(7:276)

Egypt is currently experiencing a significant digital transformation, aimed at increasing access, GDP, and jobs, in line with Egypt's Vision 2030. This includes enhancing digital education and applying (AI) in the educational system. However, Egyptian universities face challenges, such as insufficient computing power and internet limitations, hindering (AI) integration. Studies such as **Popenici & Kerr (2017), Ma & Siau (2018), Fatem Hassan El-Yagzi (2019), Sogod Ahmed Mahmoud (2021), Omar Mohamed El-Kurdi, Abdel-Maqsoud Moawad Salama (2022), and Manar Abdullah Mohamed Hassan (2022)** highlight the importance of encouraging faculty to use modern technology and equipping classrooms with necessary devices. They also recommend allocating a budget for the required AI tools and resources. The UNESCO conference also called for promoting equitable and ethical use of AI in education, ensuring gender equality and transparency. (19) (18) (7) (3) (6) (11)

Faten Hassan El-Yagzi's study (2019) stressed the importance of revising curricula to include information technologies related to artificial intelligence, as well as creating training programs for faculty staff and students to improve their skills in (AI) applications. It also called for expanding (AI) applications based on the specific needs of each type of (AI). (7: 279)

The researcher conducted an exploratory study with 18 faculty staff from the Faculty of Physical Education at Mansoura University to understand their attitudes toward digital transformation and their knowledge of artificial intelligence (AI) applications in education. The study found that (73%) of the faculty staff had positive attitudes toward digital transformation in education. However, over (85%) lacked sufficient knowledge about(AI) application in education. The researcher attributed this to the lack of necessary administrative, technical, human, and legislative requirements for (AI) implementation in the faculty, which does not align with Egypt's Vision 2030. The study aimed to identify key mechanisms for applying (AI) in the Faculty of Physical Education based on faculty staff's attitudes toward digital transformation and Vision 2030.

In light of this, the main research problem is represented by the following question:

How can artificial intelligence and its applications be employed in education at the Faculty of Physical Education, based on faculty staff's attitudes toward digital transformation according to Egypt's Vision 2030?

Research Objective:

The aim of the research is to identify the "mechanisms for applying

artificial intelligence at the Faculty of Physical Education based on faculty staff's attitudes toward digital transformation according to Egypt's Vision 2030."

Research Terms:

Artificial Intelligence:

Artificial intelligence is defined as a machine-based system that can, for a specific set of goals determined by humans, make predictions, recommendations, or decisions that influence real or virtual environments. (10: 22)

Research Procedures:

Research Methodology:

The researcher used the descriptive method with a survey style, which suits the nature of the research and its objectives. This method involves studying the phenomenon as it exists in reality, focusing on accurately describing it both qualitatively and quantitatively. It emphasizes classifying, analyzing, and drawing conclusions from the data.

Research Community:

The research community consists of faculty staff at the Faculty of Physical Education, Mansoura University, for the academic year 2022/2023, totaling 137 members. However, 46 members were excluded due to incomplete data.

Research Sample:

The primary research sample was selected using simple random sampling from the faculty staff at the Faculty of Physical Education, Mansoura University, for the academic year 2022/2023. The total number of participants was (76). Additionally, an exploratory sample was selected from the same research population but outside the primary sample, consisting of (15) participants.

Data Collection Tools:

The researcher designed a questionnaire as the primary/basic tool for data collection and followed the following steps to design the form:

- Conducting a survey of theoretical studies, research, and scientific references related to the research topic.
- Utilizing the results of the exploratory study through a structured personal interview.

The questionnaire's sections/ axes were determined, consisting of six sections/ axes based on the established objectives, which are:

-**The first section**: Administrative mechanisms for the application of (AI) systems at the Faculty of Physical Education, Mansoura University.

-**The second section**: Human resources mechanisms for the application of (AI) systems at the Faculty of Physical Education, Mansoura University.

- **The third section** : Technical and technological mechanisms for the application of (AI) systems at the Faculty of Physical Education, Mansoura University.

- **The fourth section**: Financial mechanisms for the application of (AI) systems at the Faculty of Physical Education, Mansoura University.

- **The fifth section**: Legislative mechanisms for the application of (AI) systems at the Faculty of Physical Education, Mansoura University.
- **The sixth section**: Faculty staff's attitudes towards digital transformation at the Faculty of Physical Education, Mansoura University.

Scientific Transactions of the Questionnaire Form:

First: Form Validity: Validity was calculated using two methods:

A) Content Validity:

- The proposed axes were reviewed by a group of nine experts specializing in educational technology, computer science, and information systems, all holding the title of Professor or Associate Professor. They unanimously (100%) confirmed the suitability of the axes to achieve the research objectives.
- The items expressing the questionnaire's axes were defined. The first axis included (6) main statements and (5) sub-statements, the second axis included (8) main statements, the third axis included (6) main statements and (3) sub-statements, the fourth axis included (3) main statements and (8) sub-statements, the fifth axis included (8) main statements, and the sixth axis included (13) main statements. Thus, the questionnaire was prepared in its initial form.
- The preliminary questionnaire was reviewed by nine experts in educational technology, computer science, and information systems, all Professors or Associate Professors. They assessed the adequacy of the statements and suggested modifications, with agreement levels ranging from 77.8% to 100%. A three-point rating scale (Agree (3), Somewhat Agree (2), Disagree (1)) was used.

B) Internal Consistency Validity:

The questionnaire was tested on a pilot sample of (15) members from 2/1/2023 to 19/1/2023 to standardize the research tool. Results showed a statistically significant correlation at a (0.05) significance level, with all calculated correlation coefficients exceeding the critical "R" value. Correlation coefficients for the axes ranged from (0.526 to 0.825), and for the overall questionnaire from (0.575 to 0.725), confirming its internal consistency validity.

Second: Form Reliability:

The researcher calculated the reliability of the questionnaire and its axes using Cronbach's Alpha coefficient. The results showed that the Cronbach's Alpha for each axis was equal to or less than the overall reliability, indicating high reliability for all axes without reducing the overall coefficient.

Application of the Questionnaire Form:

The final version of the questionnaire was converted to an electronic format using "Google Forms" and distributed via WhatsApp or email. It was then applied to the primary research sample

of (76) participants between 24/1/2023 and 12/2/2023.

Statistical Treatments:

-Percentage
- Pearson Correlation Coefficient
- Cronbach's Alpha Coefficient
- Frequencies
-Chi-Square(χ^2)
-Weighting Percentage

Presentation and Discussion of Results:

Section One: Administrative Mechanisms for Implementing Artificial Intelligence Systems at the Faculty of Physical Education, Mansoura University.

There are statistically significant differences between the responses of the research sample for all statements in Axis One (Administrative Mechanisms for Implementing (AI) Systems at the Faculty of Physical Education, Mansoura University), favoring the most frequent response. The calculated Chi-Square (χ^2) values ranged from (9.03 to 84.50), exceeding the tabular values at (2) degrees of freedom and (0.05) significance level.

The weighting percentages for the statements ranged from (44.3% to 92.5%), showing varied responses. (Agree) responses ranged from (9.2% to 82.9%), (Somewhat Agree) responses ranged from (11.8% to 25.0%), and (Disagree) responses ranged from (5.3% to 76.3%).

Section Two: Human Mechanisms for Implementing Artificial Intelligence Systems at the Faculty of Physical Education, Mansoura University.

There are statistically significant differences between the research sample's responses for all statements in Axis Two (Human Mechanisms for Implementing (AI) Systems at the Faculty of Physical Education, Mansoura University), favoring the most frequent response. The calculated Chi-Square (χ^2) values ranged from (7.05 to 84.97), exceeding the tabular values at (2) degrees of freedom and (0.05) significance level.

The weighting percentages for the statements ranged from (40.4% to 65.8%), with most responses leaning towards *Somewhat Agree* (13.2% to 28.9%) and *Disagree* (3.9% to 68.4%), indicating a deficiency in the human component at the Faculty of Physical Education, Mansoura University.

Section Three: Technical and Technological Mechanisms for Implementing Artificial Intelligence Systems at the Faculty of Physical Education, Mansoura University.

There are statistically significant differences between the research sample's responses for all statements in Axis Three (Technical and Technological Mechanisms for Implementing (AI) Systems at the Faculty of Physical Education, Mansoura University), favoring the most frequent response. The calculated Chi-Square (χ^2) values ranged from (20.71 to 102.8), exceeding the tabular

values at (2) degrees of freedom and a significance level of (0.05).

The weighting percentages for the statements ranged from (39.0% to 84.7%), with responses mostly leaning towards *Somewhat Agree* (6.6% to 25.0%) and *Agree* (5.3% to 64.5%). This indicates technical and technological challenges in using AI systems, with statement number (17) "The college has a high-speed internet network that greatly helps in using AI systems" ranking first at (84.7%), reflecting ease in communication systems.

Section Four: Financial Mechanisms for Implementing Artificial Intelligence Systems at the Faculty of Physical Education, Mansoura University.

There are statistically significant differences between the research sample's responses for all statements in Axis Four (Financial Mechanisms for Implementing (AI) Systems at the Faculty of Physical Education, Mansoura University), favoring the most frequent response. The calculated Chi-Square (χ^2) values ranged from (33.66 to 93.66), exceeding the tabular values at (2) degrees of freedom and a significance level of (0.05).

The weighting percentages for the statements ranged from (39.5% to 90.8%), with responses mainly in the direction of *Somewhat Agree* (5.3% to 17.1%) and *Agree* (7.9% to 85.5%). This indicates financial obstacles in using (AI) systems, with statements (26/1: 8) ranked from first to eighth with weighting percentages ranging from (86.8% to 90.8%).

Section Five: Legislative Mechanisms for Implementing Artificial Intelligence Systems at the Faculty of Physical Education, Mansoura University.

There are statistically significant differences between the research sample's responses for all statements in Axis Five (Legislative Mechanisms for Implementing (AI) Systems at the Faculty of Physical Education, Mansoura University), favoring the most frequent response. The calculated Chi-Square (χ^2) values ranged from (16.53 to 71.24), exceeding the tabular values at (2) degrees of freedom and a significance level of (0.05).

The weighting percentages for the statements ranged from (44.3% to 89.9%), with responses mostly leaning towards *Somewhat Agree* (11.8% to 21.0%) and *Agree* (9.2% to 78.9%), indicating legislative obstacles that affect the smooth use of (AI) systems at the Faculty.

Statement number (34), "I wish the state would issue legislation to help universities make optimal use of artificial intelligence technologies," ranked first with a weighting percentage of (89.9%), indicating ease in communication systems.

Section Six: Attitudes of Faculty Staff Towards Digital Transformation at the Faculty of Physical Education, Mansoura University.

There are statistically significant differences in the responses of the research sample members for all statements in Axis Six (Attitudes of Faculty Staff Towards Digital Transformation at the Faculty of Physical Education, Mansoura University), favoring the most frequent response. The calculated Chi-Square (χ^2) values ranged from (25.29 to 75.50), exceeding the tabular values at (2) degrees of freedom and a significance level of (0.05).

The weighting percentages for the statements ranged from (80.30% to 89.90%), indicating that most responses leaned towards *Agree*, highlighting faculty members' positive attitudes towards digital transformation.

Conclusions

Based on the research objectives, scientific procedures, and statistical methods applied, the researcher presents the following key conclusions:

- Many faculty staff at the Faculty of Physical Education, Mansoura University, lack awareness of (AI) concepts and applications, despite recognizing the need for digital transformation.
- There is a shortage of trained personnel for using (AI) systems.
- Faculty staff struggle with modern electronic devices due to insufficient training programs.
- Faculty staff resist (AI) adoption due to job security concerns.
- Financial resources for purchasing (AI) equipment and training at the Faculty of Physical Education, Mansoura University, are insufficient.
- Internal regulations at the faculty lack updates to support digital advancements.
- Despite challenges, faculty staff have a positive attitude toward digital transformation, fostering (AI) implementation in education.

Recommendations:

In light of the research conclusions, the researcher recommends the following:

- Expanding the use of AI systems and applications in faculties of physical education across the Arab Republic of Egypt.
- Establishing a clear and publicly announced strategy to transition from traditional methods to keeping pace with rapid technological advancements and implementing AI systems in faculties of physical education across Egypt.
- It is essential to focus on training faculty members at the Faculty of Physical Education, Mansoura University, on AI programs and systems to enhance their skills and improve their performance.
- Efforts should be made to provide all necessary facilities for implementing AI systems at the Faculty of Physical Education, Mansoura University, including administrative, human, material, technical, and legislative requirements.

- There is a need to prioritize the development of the infrastructure at the Faculty of Physical Education, Mansoura University, to accommodate any changes or developments in digital work programs.

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