EFFICIENCY OF PHYSICAL EDUCATION CURRICULA IN LIGHT OF ARTIFICIAL INTELLIGENCE REQUIREMENTS AMONG IRAQI UNIVERSITY STUDENTS

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ABSTRACT

Background. This integration helps provide personalized learning experiences that take into account individual differences among students, through the analysis of educational data and the design of flexible learning pathways that support the development of digital skills and global digital literacy. **Objectives.** This study aims to examine the efficiency of physical education curricula in Iraqi universities in light of artificial intelligence (AI) requirements. **Method**. Using the descriptive method and a questionnaire as the main tool for data collection on an exploratory sample of (30) students and a main sample of (307) students. **Results.** The results indicated that the current curricula enhance students' understanding of smart technologies in sports training and clarify the role of AI in performance analysis, while smart teaching and assessment support individual learning and data-driven decision-making. However, the application of AI faces challenges such as weak technological infrastructure, limited financial resources, and lack of technical awareness and training. **Conclusion.** Accordingly, it is recommended to develop curricula to meet AI requirements, improve teaching and assessment methods, and enhance infrastructure and resources to ensure effective implementation of modern technologies.

Keywords; physical education curricula, artificial intelligence, iraqi university.

A. INTRODUCTION

Iraqi universities are experiencing increasing challenges in adapting to the requirements of the information society and accelerated digital transformations, which calls for integrating artificial intelligence-based technologies into the educational process to improve the quality of education at various levels. This integration contributes to the provision of personalized learning experiences that take into account the individual differences between students, through the analysis of educational data and the design of flexible learning paths that support the development of digital skills and the global digital language. It also emphasizes the importance of planning, designing and systematic implementation of educational programs based on artificial intelligence, with the aim of preparing professional cadres capable of understanding the changing technological environment, interacting with it and developing it to serve the requirements of sustainable development (Lu et al., 2024; Lv et al., 2022; Pietraszewski et al., 2025).

This trend comes in light of the wide spread of artificial intelligence technologies in various fields of life, including education, where recent years have witnessed rapid development in applications such as chatbots, big data analysis, smart city systems, and artificial neural networks. The Keiper et al., Study (2023) indicated that the use of artificial intelligence contributes to the construction of smart data-based digital universities, and the Zhou et al., Study (2025) also indicated that these technologies provide cognitive and adaptive support for students and teachers and contribute to improving the quality of educational decisions.

Within the framework of physical education, the development of curricula in the era of artificial intelligence is a natural consequence of the ongoing reforms in contemporary education, where the integration of smart technologies aims to improve administrative and educational efficiency and promote the construction of advanced digital and informational educational environments. Kim et al., (2025) study pointed to the possibility of employing artificial intelligence in multiple areas within physical education, such as educational robotics, virtual and augmented reality technologies, motor performance analysis, and interactive educational content design, leading to more innovative and personalized curricula. The Navarro et al., (2024) also explained that the application of artificial intelligence brings many benefits, most notably accurate performance diagnostics, monitoring training processes, providing personalized educational services, and supporting intelligent educational decision-making.

Due to accelerated changes in the technological level and contemporary digital transformations, the need has emerged to develop physical education curricula in line with the requirements of artificial intelligence, not only at the content level, but also in teaching methods, evaluation strategies, methods of presenting scientific material, mechanisms for setting educational goals, and providing continuous feedback. Studies indicated by Palacios Zumba et al., (2024); Sanabria Navarro et al., (2024) pointed to the importance of systematic transformation in the design of educational curricula to keep pace with technical developments, contributing to the preparation of learners capable of dealing with advanced digital learning environments.

Pedagogical literature also indicates that the development of physical education curricula is positively reflected in the level of performance of both students and teachers (Haidar et al., 2025; Haniyyah et al., 2025; Stefańska et al., 2024; Zulnadila et al., 2025). The Lv et al., (2022) indicated that the development of physical education curricula contributes to improving the level of performance of students and teachers, and that all aspects of the curriculum contribute to achieving the goals of education, emphasizing the need to diversify teaching methods. In the international context, the Pietraszewski et al., (2025) explained that artificial intelligence enhances various aspects of physical education by personalizing learning, accurately evaluating learners, and providing academic guidance, while emphasizing the need to develop future teachers ' skills in artificial intelligence applications. As shown by the study of Sanghvi et al., (2024) that the use of smart wearable systems contributes to improving the accuracy of motion recognition and the development of sports activity models, which increases the effectiveness of teaching and training.

The study was confirmed by Pérez Triviño, (2023) the importance of employing smart education systems in the development of physical education curricula to improve learning and sports performance, with the need to train teachers and curriculum designers to use these technologies. Finally, a study by Yu-Ching Lo et al. explained (2023) the importance of building standardized tests to measure students ' achievement according to the curricula developed by artificial intelligence, focusing on the development of teaching skills, interaction with students and the application of mathematical concepts to achieve the goals of the lesson (Baladaniya & Choudhary, 2025; Hammes et al., 2022; Khmelnitska et al., 2025; Molavian et al., 2023; Moustakas, 2025; Zou, 2025). In this context, the importance of Keeping Up with educational curricula, especially physical education curricula, with modern scientific and technological developments is highlighted, especially in light of the growing role of digital technology and artificial intelligence applications in the educational process.

Based on the researcher's practical experience as a teacher in the field of physical education, and his observation that there are clear differences in the performance of teachers and students when applying the properly developed curricula, the current research problem has crystallized, which consists in asking how efficient these curricula are and their ability to improve educational performance, and whether their application actually contributes to raising the level of performance of teachers and students or whether it constitutes an additional burden without achieving the desired educational effect. Hence, the research problem is determined by the need to evaluate the reality of the developed physical education curricula and their efficiency in light of the requirements of artificial intelligence among students of Iraqi universities, which contributes to the development of the educational process and achieving the goals of comprehensive education.

In this regard, the researcher conducted a survey study on a sample of (30) individuals from outside the basic research sample in order to identify the degree of efficiency of physical education curricula in light of the artificial intelligence requirements of Iraqi university students. The results of the survey showed that (80%) of the respondents confirmed that the degree of efficiency was weak compared to the accelerated technological developments witnessed by the field of education in general and the field of physical education in particular. The study sample attributed this weakness to a number of reasons,

the most prominent of which are: Not including physical education curricula for modern artificial intelligence applications. Limited use of smart digital technologies in the educational process. Weak technological infrastructure in some university institutions. Lack of qualification of faculty members on the use of artificial intelligence technologies in teaching. The current curricula do not keep pace with the global developments in digital sports education.

In light of the researcher's work as a teacher, the results of previous studies, and the results of the survey study, the researcher believes that it is necessary to conduct the current study to evaluate the efficiency of physical education curricula in light of the requirements of artificial intelligence among Iraqi university students, reaching recommendations that contribute to the development of these curricula in accordance with the requirements of the digital age.

Research objectives

The research aims to identify the role of the efficiency of physical education curricula in light of the requirements of artificial intelligence among students of Iraqi universities, on the following questions:

1. What is the efficiency of the current physical education curricula in Iraqi universities in light of the requirements of artificial intelligence
2. What is the efficiency of teaching and evaluation related to the current physical education curricula in Iraqi universities
3. What are the obstacles to the use of artificial intelligence in the current physical education curricula in Iraqi universities

Suggested search terms

1. Curriculum efficiency is defined as the extent to which physical education curricula are able to achieve the desired educational and sports goals effectively and efficiently, so that they contribute to raising the level of educational and professional achievement of students (Pietraszewski et al., 2025).
2. Artificial intelligence is defined as a set of intelligent computing technologies capable of simulating human mental processes, such as learning, thinking, making decisions, and applying them in the field of physical education to improve performance, assessment, and educational data analysis (Zhou et al., 2025).

Research importance

1. Developing concepts related to the efficiency of physical education curricula and linking them to the requirements of artificial intelligence.
2. Provide a scientific framework to understand how artificial intelligence can be integrated into mathematical educational curricula to improve learning and performance.
3. Enrich the scientific literature in the field of physical education and smart education, especially in the Iraqi context.
4. Applied significance:

5. Provide practical recommendations to curriculum makers and teachers on improving physical education curricula using artificial intelligence tools.
6. Enhancing the ability of students to acquire advanced motor and cognitive skills that comply with modern standards of sports education.
7. Contribute to improving the methods of evaluating students ' sports performance through artificial intelligence techniques.
8. Supporting Iraqi universities in integrating modern technology into their educational programs to improve the quality of sports education and the efficiency of graduates.

B. METHOD

Participant

The research community consists of students from the faculties of physical education and Sports Sciences, which are represented by(8) Iraqi universities(University of Baghdad, Kufa, Babylon, Kirkuk, Maysan, Karbala, Basra, Diyala), for the academic year 2025/2026.

Table 1. Distribution Of The Research Sample

No.	Faculties	Students No.	Percentage
1	Faculties of physical education and Sports Sciences-University of Baghdad	52	16.94
2	Faculties of physical education and Sports Sciences-University of Kufa	34	11.07
3	Faculties of physical education and Sports Sciences-University of Babylon	32	10.42
4	Faculties of physical education and Sports Sciences - University of Kirkuk	48	15.64
5	Faculties of physical education and sports sciences-Maysan University	28	9.12
6	Faculties of physical education and sports sciences-Karbala University	39	12.70
7	Faculties of physical education and Sports Sciences-University of Basra	41	13.36
8	Faculties of physical education and Sports Sciences-University of Diyala	33	10.75
	Total	307	100%

Scientific transactions (honesty-consistency) to questionnaire the efficiency of physical education curricula in light of the requirements of artificial intelligence among students of Iraqi universities.

1. Honesty and consistency of the questionnaire:
2. First: honesty:
3. The researcher relied on Miley's honesty calculation:
4. Believe the content (content):

Research Design

The researcher used the descriptive method (survey method) with its steps and procedures, which provides an understanding of the efficiency of physical education curricula in light of the artificial intelligence requirements of Iraqi university students; this

method studies the research variables as they are among the sample members without the researcher having a role in adjusting the variables subject to measurement.

The researcher conducted a systematic analysis of references, books and specialized scientific research related to the subject of physical education curricula and artificial intelligence based on the data collected through personal interviews and the scientific studies and references reviewed by the researcher, three main axes were identified representing the axes of efficiency of the physical education curricula under study he was keen to verify the consistency of the content of each axis with the phrases included under it and the questionnaire as a whole, based on the reference survey he conducted of theoretical frameworks, previous studies, and metrics related to the subject of efficiency of physical education curricula in light of the requirements of artificial intelligence.

Logical honesty (honesty of arbitrators)

The researcher presented the axes reached to(9) experts in the field of physical education curricula, artificial intelligence facility(2), and their experience in the field is not less than(10) years, in order to express an opinion on their suitability and adequacy to build a questionnaire, and based on the opinions of experts, all axes with an approval rate(88%) and more were accepted, Table(2).

Table 2. Preliminary Picture Of Axes Of Physical Education Curriculum Competency Questionnaire In View Of Requirements Of Artificial Intelligence

No	Questionnaire topics	Expert opinion		
		Agree	disagree	Percentage
1-	The efficiency of the current physical education curricula in Iraqi universities in the light of artificial intelligence requirements	9	0	100%
2-	The efficiency of teaching and evaluation related to the current physical education curricula in Iraqi universities	9	0	100%
3-	Obstacles to the use of artificial intelligence in the current physical education curricula in Iraqi universities	8	1	88%

Based on the information gathered from the reviewed studies and specialized references, the researcher formulated the sub-phrases listed under each of the identified axes to build the questionnaire. In order to get an opinion on whether the sub-phrases were suitable and adequate, they were presented to nine experts in the field of physical education curricula, artificial intelligence (Annex 2), who have a minimum of ten years of experience in the field (Annex 3).

After the judges gave their approval to the questionnaire's axes, we developed phrases for each axis and sent them to nine experts in physical education curricula, artificial intelligence (Annex 2) with at least ten years of experience to gauge their suitability and adequacy for the questionnaire. From 5/11/2025 to 15/11/2025, we solicited their opinions, and based on them, we accepted all of the agreed-upon phrases, which amounted

to 66% or more. Additionally, we paraphrased several phrases in some axes based on the experts' recommendations, as shown in Table (3).

Table 3. Topics Of Physical Education Curriculum Competency Questionnaire In View Of Requirements Of Artificial Intelligence

No.	Questionnaire topics	Number of	
		Before expert opinion	after expert opinion
1-	The efficiency of the current physical education curricula in Iraqi universities in the light of artificial intelligence requirements	12	12
2-	The efficiency of teaching and evaluation related to the current physical education curricula in Iraqi universities	12	12
3-	Obstacles to the use of artificial intelligence in the current physical education curricula in Iraqi universities	12	11
	Total	30	36

To answer the vocabulary questions, the researcher utilized the following triple estimation balancing method:

1. Three degrees is the ballpark, so sure, it is.
2. Relatively straightforward: two degrees is the best estimate.
3. Contradict: within a degree

Believe internal consistency: The researcher assessed the validity of the hypothesis formulation through the internal consistency method, examining the representation of questionnaire items, the correlation of each item's score with its respective axis total, and the interrelation of the questionnaire scores and axes with the overall questionnaire score, following the administration of the questionnaire to the survey sample, as illustrated in Tables 4, 5, and 6.

Table 4. correlation coefficients between the degree of each singularity and the degree of the first axis

The first axis: (the extent to which students of the faculties of physical education and sports sciences possess the necessary digital skills to deal with the developed curricula)							
No.	Correlation coefficient	No.	Correlation coefficient	No.	Correlation coefficient	No.	Correlation coefficient
1	0.709**	4	0.660**	7	0.643**	10	0.784**
2	0.620**	5	0.792**	8	0.717**	11	0.611**
3	0.717**	6	0.701**	9	0.721**	12	0.790**

* Tabular Value (t) at the level of significance (0.05)= (0.444) * * at (0.01)= (0.561)

Table 5. Correlation Coefficients Between Degree Of Each Singleton And Degree Of Second Axis (N= 20)

The second axis: (the availability of devices, programs, and digital resources to support students of the faculties of physical education and Sports Sciences in following the developed curricula)							
No.	Correlation coefficient	No.	Correlation coefficient	No.	Correlation coefficient	No.	Correlation coefficient
1	0.668**	4	0.631**	7	0.722**	10	0.659**

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Prodi Olahraga Rekreasi
Fakultas Ilmu Olahraga
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2	0.796**	5	0.676**	8	0.729**	11	0.647**
3	0.751**	6	0.610**	9	0.781**		

* Tabular Value (t) at the level of significance (0.05)= (0.444) * * at (0.01)= (0.561)

Study schedules (4), and (5) demonstrate a statistically significant correlation between the phrases and the overall score of the axis for the questionnaire assessing the efficacy of physical education curricula in the context of artificial intelligence requirements, at the significance levels of (0.05) and (0.01). This indicates the validity of the internal consistency between phrases and cumulative score of axis. The researcher used internal consistency reliability to assess the validity of the questionnaire by determining the correlation coefficient between the total score of each dimension and the overall questionnaire score, as shown in Table 6.

Table 6. Correlation Coefficients Between Questionnaire Axes And Each Other (N= 20)

Topics of the questionnaire	The efficiency of the current physical education curricula in Iraqi universities in the light of artificial intelligence requirements	The efficiency of the current physical education curricula in Iraqi universities in the light of artificial intelligence requirements	Obstacles to the use of artificial intelligence in the current physical education curricula in Iraqi universities
The efficiency of the current physical education curricula in Iraqi universities in the light of artificial intelligence requirements		0.753**	0.729**
The efficiency of teaching and evaluation related to the current physical education curricula in Iraqi universities			0.692**
Obstacles to the use of artificial intelligence in the current physical education curricula in Iraqi universities			

* Tabular Value (t) at the level of significance (0.05)= (0.444) * * at (0.01)= (0.561)

By studying Table (6), it is clear that there are correlations between the axes of the questionnaire and each other, ranging from (0.692) to (0.753); at the level of statistical significance (0.05), (0.01), which indicates the existence of internal consistency between the axes of the questionnaire.

Table 7. Correlation Coefficients Between Score Of Each Axis And Overall Score Of Questionnaire (N= 20)

Themes	Correlation coefficient
The efficiency of the current physical education curricula in Iraqi universities in the light of artificial intelligence requirements	0.716**
The efficiency of teaching and evaluation related to the current physical education curricula in Iraqi universities	0.732**

Obstacles to the use of artificial intelligence in the current physical education curricula in Iraqi universities	0.698**

* Tabular Value (t) at the level of significance (0.05)= (0.444) * * at (0.01)= (0.561)

As it can be seen upon the analysis of Table (7), there is statistically significant correlation between the total score of the axis and the overall questionnaire score, with correlation coefficients values of 0.698-0.732. These correlations are meaningful at the traditional alpha of 0.05 and 0.01 hence revealing internal consistency of the questionnaire axes. Secondly: Constancy: The researcher used the Cronbachs Alpha coefficient to estimate the constancy of the axes and overall score of the questionnaire; this approach relies on the homogeneity of the scores of the respondents (Table 8).

Table 8. Alpha Coefficients Of The Constancy Of The Questionnaire Axes-Efficiency Of Physical Education Curricula In Light Of Artificial Intelligence Requirements (N= 20)

No.	Topics of questionnaire	Alpha coefficient values
1-	The efficiency of the current physical education curricula in Iraqi universities in the light of artificial intelligence requirements	0.751**
2-	The efficiency of teaching and evaluation related to the current physical education curricula in Iraqi universities	0.772**
3-	Obstacles to the use of artificial intelligence in the current physical education curricula in Iraqi universities	0.703**

* Tabular Value (t) at the level of significance (0.05)= (0.444) * * at (0.01)= (0.561)

Investigation of Table 8 shows that the stability of the questionnaire dimensions was measured between the values of Cronbach alpha between 0.703 to 0.772 that showed a high degree of reliability.

Statistical treatment plan

The statistical processing of the research data was carried out using the statistical program SPSS, and the researcher used the following statistical manipulations: Chi2. Duplicates. The percentage. The weighting ratio. Weighted scores. The results were rounded to the nearest two decimal places, and the results were based on a statistical significance level at the level of 0.05.

A. RESULTS

Data were gathered, sorted, unpacked, and tabulated in order to conduct suitable statistical treatments after the researcher checked the honesty and consistency characteristics. Then, the questionnaire was administered to basic research sample (307). Discussion, analysis, and presentation of findings: The researcher will use Table to present, analyze, and evaluate the findings of the first question, which asks, "What is the efficiency of the content of physical education curricula in light of the requirements of artificial intelligence?" (20).

Table 9. Study sample answers broken down by number of repetitions, estimated total, relative weight, and Chi2 value when considering first axis, which deals with effectiveness of Iraqi institutions' present physical education programs in relation to AI needs (n=307)

No.	Phrases	Iterations			Degree Discretionary	ratio Discretion	Chi²
		Agree	some extent	Discretionary			
1	The current physical education curricula at Iraqi universities are keeping pace with modern developments in the field of artificial intelligence.	63	66	178	499	54.18	83.97
2	The current curricula in the faculties of physical education at Iraqi universities include basic concepts related to artificial intelligence.	72	59	176	510	55.37	80.37
3	Current curricula link theoretical aspects with intelligent applications in the mathematical field.	67	72	168	513	55.70	63.33
4	The current physical education curricula at Iraqi universities contribute to the development of digital culture among students.	89	69	149	554	60.15	33.88
5	Current approaches demonstrate the role of artificial intelligence in the analysis of sports performance.	60	134	113	561	60.91	28.42
6	The current curricula at Iraqi universities support the use of digital data in mathematical decision - making.	84	80	143	555	60.26	24.32
7	The current curriculum enhances students ' understanding of the importance of smart technologies in sports training.	73	120	114	573	62.21	12.79
8	The current physical education curricula at Iraqi universities take into account the requirements of digital transformation.	53	156	98	569	61.78	52.11
9	The current curricula contribute to preparing students for the requirements of the digital sports job market.	60	72	175	499	54.18	78.10
10	Current physical education curricula develop analytical thinking skills using smart tools.	57	63	187	484	52.55	105.25
11	The current curricula in Iraqi universities encourage the use of modern digital applications.	45	163	99	560	60.80	68.20
12	Current physical education curricula support innovation in the use of smart technologies.	39	142	126	527	57.22	60.05

The tabular value of KA2 is when (0.05)= (5.99)

Studying table (9), it converts clear that the relative weight of the first axis (the efficiency of the current physical education curricula in Iraqi universities in light of the requirements of artificial intelligence), ranged from (52.55% to 62.21%). It is also clear that the value of Chi2 ranged between(12.79) and(105.25), which is statistically a function of all the terms of the first axis. The results of the training showed that phrase number (7), which conditions that "the current curricula enhance students' understanding of the importance of smart technologies in sports training," received the highest response rate among the respondents, reaching (62.21%), reflecting students ' awareness of the importance of including smart technologies in modern sports curricula and their role in improving learning and developing motor skills. Phrase number (5), which states that "current curricula explain the role of artificial intelligence in analyzing sports performance," came in second place with a response rate of 60.91%, indicating students ' interest in understanding how to use artificial intelligence tools to analyze sports performance and follow the individual development of the student in an accurate scientific way.

It is noted that despite these high percentages, there are some weak responses that reflect gaps in students ' awareness of some aspects of the curricula, where table (10) showed that the relative weight of the first axis on "the efficiency of current physical education curricula in Iraqi universities in light of artificial intelligence requirements" ranged from (52.55% to 62.21%, this indicates that students ' assessment of the curricula ranges from acceptable to good, with an opportunity to improve some axes, especially with regard to integrating artificial intelligence and modern technologies more broadly and deeper in the educational process, thereby contributing to raising the level of understanding students and their mastery of the digital and analytical skills necessary to keep up with the requirements of the Times Talk about physical education.

This disparity also reflects the importance of conducting periodic curriculum reviews and developing training programs for teachers to enhance their ability to effectively employ artificial intelligence in the classroom and in practice, in order to achieve the desired educational and Sports Goals. This is consistent with the results of the Shalabi study (2008), which emphasized the importance of employing modern educational technologies in teaching physical education curricula at the preparatory stage, where the results showed that computers and multimedia devices such as hypermedia and Multimedia represent one of the best tools to support student learning, and the study recommended the establishment of computer laboratories for sports education (Dedicated Computer Labs for physical education) and provide online educational programs (Novatchkov & Baca, 2013).

The Mohsen Sadr et al., (2024) also stressed the need to take advantage of Modern Studies in the field of physical education, especially those that emphasize the importance of diversification in teaching methods and integrating them into curricula, in order to contribute to improving the educational and sports performance of students. Based on this, the researcher explains that the first axis related to the "efficiency of current physical education curricula in Iraqi universities in light of artificial intelligence requirements" reflects an acceptable to a good level in students 'appreciation of the efficiency of these curricula, with the need to work on developing aspects related to the integration of artificial intelligence and smart technologies (Artificial Intelligence & Smart Technologies) more

broadly in the educational process, in order to enhance students' understanding of the importance of modern technologies in sports training and develop their motor and cognitive skills, in order to achieve the goals of the axis in raising the efficiency of curricula and updating them to keep pace with the requirements of the digital age.

The researcher current, interpret and discuss the results reached to answer the second question "What is the efficiency of teaching and evaluation methods in light of the requirements of artificial intelligence", through Table 10.

Table 10. Repetitions, estimated total, relative weight and Chi2 value of responses of research sample for second axis (teaching efficiency and evaluation related to current physical education curricula in Iraqi universities) (n=307)

No.	Phrases	Iterations			Degree Discretionary	ratio Discretion	Chi^2
		Agree	some extent	Discretionary			
1	Teaching related to the current curricula in Iraqi universities uses artificial intelligence technologies.	131	88	88	657	71.34	12.05
2	Teaching within the framework of the current curriculum contributes to improving students ' understanding of smart technologies.	92	158	57	649	70.47	51.41
3	The teaching accompanying theexisting physical education curricula is based on interactive digital tools.	116	101	90	640	69.49	3.33
4	Teaching within the current curricula at Iraqi universities develops students ' self-learning skills.	121	99	87	648	70.36	5.81
5	The calendar linked to the current curriculum supports the use of intelligent systems in performance measurement.	73	136	98	589	63.95	19.67
6	The electronic calendar within the current curricula in Iraqi universities contributes to the achievement of objectivity.	131	108	68	677	73.51	19.86
7	The smart calendar linked to the current curriculum provides instant feedback to students.	77	142	88	603	65.47	23.65
8	The calendar within the framework of the current physical education curriculum measures practical skills digitally.	84	101	122	576	62.54	7.08
9	Artificial intelligence contributes to monitoring the level of students within the current curricula at Iraqi universities.	95	101	111	598	64.93	1.28
10	Smart teaching associated withexisting curricula helps to take into account individual differences.	182	58	67	729	79.15	93.43
11	The calendar in the current curricula at Iraqi universities supports the analysis of educational data.	167	77	63	718	77.96	62.25

No.	Phrases	Iterations			Degree Discretionary	ratio Discretion	Chi²
		Agree	some extent	Discretionary			
12	AI-based teaching within the current curriculum enhances student motivation.	120	88	99	635	68.95	5.17

The tabular value of KA2 is when (0.05)= (5.99)

Studying table (10), it becomes clear that the relative weight of the second axis (teaching efficiency and evaluation associated with the current physical education curricula in Iraqi universities) ranged from (62.54% to 79.15%). It is also clear that the value of KA2 ranged between (1.28) and (93.43), which is a function statistically in all the statements of the second axis, except for the statement Number(3)، (4)، (9)، (12). The results of the second axis showed that the phrase number (10), which states that "smart teaching related to the current curricula helps to take into account individual differences," received the highest response rate among the respondents, reaching (79.15%), reflecting students ' appreciation of the great role played by Smart Teaching Strategies in adapting educational content to the individual needs of each student, enhancing learning effectiveness, and developing motor and cognitive skills for each individual.

The phrase number (11), which states that "the calendar in the current curricula at Iraqi universities supports the analysis of educational data," came in second place with a response rate (77.96%), indicating students ' awareness of the importance of educational data Analysis in monitoring academic performance, providing accurate feedback, and supporting evidence-based decision-making in the educational process. Kadhim, Mashi, Al-Diwan, & Ghazi (2024) agree with these results, which confirmed that the creation of benchmark tests to assess student achievement and measure the level of understanding and knowledge contributes to guiding the teaching and learning process and achieving the goals of lessons in physical education.the study also showed a strong correlation between the skills, knowledge and behaviors measured by students, reflecting the importance of integrating smart tools and modern technologies in sports education to enhance students ' overall performance and achieve integrated educational and sports results.

Based on these results, the studies recommend the need to focus on the development of teaching and interaction skills with students (Teaching and Interaction Skills), and the integration of artificial intelligence and modern technologies (Artificial Intelligence & Modern Technologies) in educational curricula, whether through smart wearable systems or digital analysis programs, to improve educational and Sports Performance, raise the level of professional competence of teachers, and ensure the achievement of an advanced level of achievement among students (Keiper et al., 2023; Kim et al., 2025; Navarro et al., 2024; Zhou et al., 2025).

In general, the researcher believes that the second axis related to the efficiency of teaching and evaluation associated with the current physical education curricula in Iraqi universities reflects a positive assessment by students of the importance of integrating smart

technologies in the educational process, with the need to work to enhance practical training for teachers and provide appropriate digital tools to support individual and group learning . The researcher will present, interpret and discuss the results reached to answer the third question "What are the obstacles and requirements for the use of artificial intelligence in physical education curricula", through Table (11).

Table 11. Repetitions, estimated total, relative weight and Chi² value of responses of research sample for third axis (obstacles to use of artificial intelligence in current physical education curricula in Iraqi universities) (n=307)

No.	Phrases	Iterations			Degree Discretionary	ratio Discretion	Chi²
		Agree	some extent	Discretionary			
1	The current physical education curricula in Iraqi universities face a weakness in the technological infrastructure.	255	32	20	849	92.18	342.34
2	The lack of training of teaching staff hinders the employment of artificial intelligence in the current curriculum.	236	30	41	809	87.84	262.48
3	The lack of material resources limits the development of current curricula in Iraqi universities.	216	61	30	800	86.86	194.08
4	The lack of technical awareness reduces the effectiveness of the application of artificial intelligence in current curricula.	219	71	17	816	88.60	213.76
5	The lack of digital training programs hinders the development of students within the current curriculum.	202	66	39	777	84.36	149.17
6	Students have difficulty using smart applications associated with the current curriculum.	140	108	59	695	75.46	32.53
7	Weak institutional support limits the integration of artificial intelligence into the curricula of current Iraqi universities.	165	75	67	712	77.31	57.88
8	Current curricula suffer from poor flexibility in keeping up with digital development.	209	43	55	768	83.39	167.48
9	The current physical education curricula at Iraqi universities require constant updating.	216	67	24	806	87.51	198.42
10	Students need advanced digital skills to apply artificial intelligence within the current curriculum.	188	64	55	747	81.11	107.97
11	The current curriculum requires cadres specializing in sports technology.	155	93	59	710	77.09	46.31

The tabular value of KA2 is when (0.05)= (5.99)

By studying table (11), it becomes clear that the relative weight of the third axis (obstacles to the use of artificial intelligence in the current physical education curricula at

Iraqi universities) ranged from (88.60% to 92.18%). It is also clear that the value of KA2 ranged between(32.53) and(342.34), which is statistically a function of all the terms of the third axis. The results of the third axis showed that phrase number (1), which states that "the current physical education curricula in Iraqi universities face a weakness in the technological Infrastructure", received the highest response rate among the respondents, reaching (92.18%), reflecting the students ' awareness of the importance of a strong infrastructure to support digital education and the application of smart teaching strategies.

The statement Number (3), which states that "the weak financial & Material resources limit the development of current curricula in Iraqi universities," came in second place with a response rate of 88.86%, indicating students ' awareness of the pivotal role of Finance and material resources in enabling universities to update curricula and apply modern tools and technologies, including smart wearable systems and digital analysis programs, to support individual and group learning and improve academic and athletic performance. These results reflect the urgent need to develop the technological infrastructure and adequate resources (Adequate Resources & Technological Infrastructure) in Iraqi universities to ensure the effective application of physical education curricula in light of the requirements of the digital age and artificial intelligence. In this regard, the Lee & Lee study (2021) noted that artificial intelligence enhances all aspects of physical education by allocating classes, evaluating learners, and providing academic guidance, emphasizing the need to develop future teachers ' skills in artificial intelligence applications.

The study of Lu et al. (2024) also showed that the application of artificial intelligence in sports activity development models improves the accuracy of motion recognition and enhances the effectiveness of teaching using intelligent wearable systems. The study of Lv et al. (2022) emphasized the importance of developing physical education curricula using smart education systems to improve learning and sports performance, with a recommendation to train teachers and curriculum designers to enhance professionalism. In general, it can be said that the results of the third axis related to the obstacles of employing artificial intelligence in the current physical education curricula at Iraqi universities reflect the need to address the shortcomings in the technological infrastructure and provide adequate material resources, focusing on integrating smart systems and developing teachers capabilities in using modern technologies to ensure improving the quality of sports education and raising the level of academic and sports performance of students (Mashud et al., 2024; Rahmadi et al., 2023; Rubiyatno et al., 2023; Suryadi et al., 2023).

B. CONCLUSION AND RECOMMENDATIONS

Based on the results of this research, in view of the approach used, the limitations of the sample and the data collection tool, the following can be deduced: First: the efficiency of the current physical education curricula in Iraqi universities in light of the requirements of artificial intelligence. The current curriculum enhances students' understanding of the importance of smart technologies in sports training. Current approaches demonstrate the role of artificial intelligence in the analysis of sports performance. Second: the efficiency of teaching and evaluation related to the current physical education curricula in Iraqi universities smart teaching associated with the current curriculum helps to take into account

individual differences between students, which contributes to the improvement of individual and group learning. The assessment in the current curriculum supports the analysis of educational data, providing accurate feedback and promoting evidence-based decision-making in the educational process. Third: the obstacles of employing artificial intelligence in the current physical education curricula in Iraqi universities physical education curricula face a weak technological infrastructure, which limits the possibility of effectively applying artificial intelligence tools. The weak material and financial possibilities limit the development of existing curricula and the provision of modern technologies to students and teachers. The lack of technical awareness and professional training reduces the effectiveness of the application of artificial intelligence in the curriculum, which requires specialized training programs for teachers and curriculum designers.

Proceeding from the results of the research and the conclusions made, it is recommended that developing physical education curricula to meet the requirements of artificial intelligence, which enhances students ' understanding of the importance of modern technologies in sports training and contributes to improving individual and group performance. Enhance the efficiency of teaching and evaluation through the adoption of smart teaching methods that help to take into account individual differences between students, and support the analysis of educational data to provide accurate feedback and make informed educational decisions. Improve the infrastructure and material resources of universities to ensure the effective application of modern technologies and intelligent systems in sports education, including the provision of modern laboratories, equipment and specialized training programs for teachers. Raising awareness and technical training for teachers and curriculum designers, through educational programs and specialized workshops to introduce them to the methods of using artificial intelligence and digital technologies in physical education. Focus on developing continuous educational and training programs for students, to enhance their mathematical and intellectual skills, and linking education with practical requirements in the sports field. Encourage continuous scientific research to evaluate the effectiveness of integrating modern technologies in physical education, and analyze their impact on the educational and sports performance of students.

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D. AUTHOR CONTRIBUTION STATEMENT

All authors are responsible for the completed manuscript.

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