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ORIGINAL STUDY

Attitudes of Female Physical Education and Sports Science Teachers Toward the Use of AI Applications

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Abstract

The integration of artificial intelligence (AI), whether through devices or software, has become a critical tool in analyzing and evaluating technical performance. AI significantly contributes to enhancing athletic performance by enabling accurate data analysis and supporting educators in developing effective training programs and interactive curricula. This study addresses a noticeable gap in the literature regarding the attitudes and inclinations of educators toward AI in physical education and sport sciences—a gap often attributed to limited awareness and lack of access to modern technologies. The primary aim of the study is to examine the tendencies and perceptions of female instructors in physical education and sport sciences toward the use of AI in improving athletic performance across various activities. It also explores the current state of attitudes regarding AI integration, the influencing factors—both motivating and hindering—and the differences in orientation based on instructors' specialization (theoretical vs. practical). A descriptive research design was employed, involving a purposive sample of 20 female faculty members from the College of Physical Education and Sport Sciences for Women. The results showed generally positive attitudes toward AI use in education, reflecting clear acceptance of these technologies in the teaching process. However, attitudes were influenced by several factors, particularly the nature of academic specialization. These findings highlight the need to enhance training and professional development related to AI, especially for those showing less favorable attitudes, to promote equal access to modern teaching tools. Accordingly, the researchers recommend implementing targeted training programs to improve instructors' proficiency in using AI applications in educational settings. and this achieves one of the sustainable development goals of the United Nations in Iraq which is (Quality Education)

Keywords: Artificial intelligence, Attitudes of female physical education, Sports science teachers

1. Introduction

The world is experiencing rapid technological development across various sectors. Artificial intelligence (AI) plays a significant role in driving major progress, particularly in the field of sports. The use of AI—whether through devices or software—has become one of the modern tools contributing to the analysis and evaluation of technical performance.

Many researchers emphasize that AI supports the design of training programs and the development of teaching and coaching strategies in physical education and sports sciences (Wang & Wang, 2024). The teacher plays a central role in knowledge transfer and in enhancing athletic performance. Therefore, understanding teachers' inclinations and attitudes toward AI is essential in determining the success of its application in the sports domain. These inclinations vary based on factors such as technological experience, available resources, and specialization.

This study is important because AI, as a product of technological advancement, has become a valuable tool in improving athletic performance. It enables precise data analysis and helps teachers design more interactive and effective training programs. Despite this, a clear gap remains in research addressing teachers' attitudes toward AI in physical education and sports science. Researchers often attribute this gap to several challenges, including limited knowledge, a

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lack of access to advanced technologies, and difficulty in keeping up with developments in the field.

Based on this, the following research questions arise:

1. What are the attitudes of physical education and sports science teachers toward using AI to enhance sports performance?
2. Does the lack of infrastructure limit the adoption of AI in the field?
3. What are the key factors influencing teachers' interest in AI?
4. Does specialization and experience in modern technologies affect the adoption of AI in sports?

1.1. Research objectives

This study aims to:

- Identify the attitudes and tendencies of female physical education and sport sciences instructors toward the use of artificial intelligence in enhancing athletic performance across different sports activities.
- Explore the current attitudes toward the use of artificial intelligence applications in physical education and sport sciences.
- Investigate the factors (incentives and barriers) influencing the tendencies and attitudes toward the use of artificial intelligence.
- Examine the differences in attitudes toward the use of artificial intelligence applications based on the academic specialization (practical vs. theoretical).

1.2. Research hypothesis

There are no statistically significant differences in attitudes toward the use of artificial intelligence applications based on academic specialization (practical vs. theoretical).

1.3. Scope of the study

- **Human Scope:** Female faculty members at the College of Physical Education and Sport Sciences for Women.
- **Temporal Scope:** From January 19 to January 20, 2025.
- **Spatial Scope:** College of Physical Education and Sport Sciences for Women.

2. Method

The research population consisted of female instructors in the College of Physical Education and Sport Sciences for Women. The sample included 20 instructors, divided equally between instructors of practical subjects (n = 10) and instructors of theoretical subjects (n = 10). The sample was selected intentionally to fit the study requirements.

The researchers used a range of sources to gather information, including Arabic and foreign references, the internet, personal interviews, expert opinion surveys, data collection forms, an artificial intelligence applications usage scale, and a Dell computer.

2.1. Research procedures

Given the nature of the current descriptive study and its focus on the phenomenon under investigation, the researchers followed a scientific approach in selecting psychometric tools based on the following measurement instruments to achieve the study's objectives.

2.2. Artificial intelligence applications attitudes scale

After reviewing the relevant literature and theoretical studies, the researchers selected the Artificial Intelligence Applications Attitudes Scale developed by Amish and Al-Zoghbi (2025). The scale consists of 48 items (Appendix 1) distributed across three dimensions.

- **Dimension One:** Current attitudes toward the use of artificial intelligence applications in teaching (items 1–20).
- **Dimension Two:** Obstacles to using artificial intelligence applications in teaching (items 1–15).
- **Dimension Three:** Incentives encouraging the use of artificial intelligence applications in teaching (items 1–13).

Participants responded to the items using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The total possible score ranges from 48 to 240, with a theoretical mean of 144.

The scale was reviewed by a panel of experts to evaluate the validity and appropriateness of its items for the research sample. After collecting feedback, the researchers made minor adjustments that did not alter the meaning or content of the items. The results showed 100% agreement among experts regarding the suitability of the scale for the target sample.

2.3. Pilot study

To ensure the accuracy and scientific reliability of the data, the researchers conducted a pilot study on January 20, 2025. The sample included six instructors.

Table 1. Split-half reliability for the Artificial Intelligence applications Attitudes Scale.

Seq.	Scale	Correlation Coefficient	Level of significance
1	Trends in the Use of Artificial Intelligence Applications in Teaching	0.986	sig

The pilot study aimed to prepare the necessary conditions for the successful application of the main scale during the primary experiment, allow participants to ask questions, and address any potential errors or challenges that could arise during the distribution of the scale by the assisting team. It also aimed to calculate the scientific foundations of the scale.

3. Scientific foundations of the scale

3.1. Content validity

Content validity, established through expert judgment, is a key criterion for accepting or modifying items before the main application. It refers to the degree to which the scale comprehensively measures the dimensions of the phenomenon under investigation. To ensure content validity, the scale was reviewed by a panel of experts, resulting in 100% agreement on the appropriateness of the items for measuring attitudes toward the use of artificial intelligence applications.

3.2. Reliability

A good test must demonstrate reliability, which is an essential condition for determining the quality of a measurement tool. To verify the reliability of the scale, the researchers used the split-half method, one of the most common approaches to assessing reliability. The results showed high reliability coefficients. Table 1 presents the reliability values obtained.

Table 1 presents the split-half reliability of the Artificial Intelligence Usage Attitudes Scale. The calculated correlation coefficient is (0.986), which indicates a high and acceptable value.

3.3. The reliability coefficient

The researchers adopted the Cronbach's alpha reliability coefficient to measure the internal consistency between the first and second halves of the questionnaire, in addition to using the reliability coefficient for the individual items of the questionnaire. This led to the acceptance of the reliability coefficient. The reliability coefficient of the scale in this method was (0.986), with an error level of (0.000), which are both high and acceptable values.

3.4. Main experiment

The researchers conducted the main experiment by distributing the questionnaires to the research sample over two days, Sunday, January 19–20, 2025. The sample consisted of 20 faculty members, including both practical and theoretical specializations. After collecting the questionnaires, the researchers reviewed them to ensure all responses were complete. Then, the data was statistically processed to assess the extent to which the research objectives and hypotheses were achieved.

3.5. Statistical tools

The researchers used the Statistical Package for Social Sciences (SPSS-18) for the data analysis.

4. Results

As shown in Table 2, the statistical values for the scale measuring attitudes toward the use of artificial intelligence applications in teaching are presented. These values include the mean, standard deviation, median, skewness coefficient, and the hypothetical mean for the three dimensions, aimed at assessing the nature of the data distribution. The results indicate that the overall mean score reached (210.80), which is higher than the hypothetical mean of (144), suggesting that participants from practical specializations

Table 2. Shows the means, standard deviations, median, and skewness coefficient for the scale of attitudes toward the use of artificial intelligence applications in teaching and its three dimensions for the practical specialization.

Variables	Arithmetic Mean	Median	Standard Deviation	Skewness Coefficient	Hypothetical Mean
Trends in the use of artificial intelligence applications (practical)	210.80	210.50	18.48	0.67	144
The first dimension is the reality of trends towards the use of artificial intelligence applications in teaching	110.40	114.50	13.41	0.81	60
The second dimension What are the obstacles to using artificial intelligence applications in teaching?	63.50	62.50	10.17	0.26	45
The third dimension is what are the incentives that encourage the use of artificial intelligence applications in teaching	53.50	55.00	14.34	1.42	36

Table 3. Shows the means, standard deviations, median, and skewness coefficient for the scale of attitudes toward the use of artificial intelligence applications in teaching and its three dimensions for the theoretical specialization.

Variables	Arithmetic Mean	Median	Standard Deviation	Skewness Coefficient	Hypothetical Mean
Trends in the use of artificial intelligence applications (theoretical)	179.10	183.50	15.92	0.85	144
The first dimension is the reality of trends towards the use of artificial intelligence applications in teaching	85.50	82.50	10.39	0.20	60
The second dimension What are the obstacles to using artificial intelligence applications in teaching?	45.30	38.00	12.84	0.21	45
The third dimension is what are the incentives that encourage the use of artificial intelligence applications in teaching	36.9	34.00	7.14	0.74	36

Table 4. Shows the values of the means, standard deviations, and T-test results for each dimension of the scale for both the practical and theoretical specializations.

Dimensions of the scale of trends in the use of artificial intelligence applications		Specialization	Arithmetic mean	Standard deviation	Test- (T)	Sig	Significance
First dimension	The reality of trends towards the use of artificial intelligence applications in teaching	Practical Theoretical	110.40 85.50	13.41 10.39	4.021	0.003	Significant
Second dimension	What are the obstacles to using artificial intelligence applications in teaching?	Practical Theoretical	63.50 45.30	10.17 12.84	5.084	.0010	Significant
Third dimension	What are the incentives that encourage the use of artificial intelligence applications in teaching?	Practical Theoretical	53.50 36.90	14.34 7.14	3.895	0.004	Significant
Total Degree	Trends in the use of artificial intelligence applications in teaching	Practical Theoretical	210.80 179.10	18.48 15.92	4.110	0.001	Significant

have positive attitudes toward the use of artificial intelligence applications in teaching.

As shown in Table 3, the statistical values for the scale measuring attitudes toward the use of artificial intelligence applications in teaching are presented. These values include the mean, standard deviation, median, skewness coefficient, and the hypothetical mean for the three dimensions, aimed at assessing the nature of the data distribution. The results indicate that the overall mean score reached (179.10), which is higher than the hypothetical mean of (144), suggesting that participants from theoretical specializations hold positive attitudes toward the use of artificial intelligence applications in teaching.

As shown in Table 4, the values of the means, standard deviations, and T-test results for each dimension of the scale are presented(T)For each dimension of the scale and for both practical and theoretical specializations, the overall score reached (4.110).

As shown in Table 5, the values of the means, standard deviations,-T-value, and its comparison with the hypothesized mean for the scale of attitudes toward the use of artificial intelligence applications in teaching for the practical specialization are presented. TheT -value for the first dimension was (35.57), for the second dimension (25.30), and for the third dimension (13.26).

As shown in Table 6, the values of the means, standard deviations, T-value, and its comparison with the hypothesized mean for the scale of attitudes toward the use of artificial intelligence applications in teaching for the theoretical specialization are presented.

Table 5. Shows the means, standard deviations, T-value, and its comparison with the hypothesized mean for the scale of attitudes toward the use of artificial intelligence applications in teaching for the practical specialization.

Variables	Arithmetic mean	Standard deviation	skewness coefficient	Hypothetical mean	T-test	sig	Significance
The first dimension is the reality of trends towards the use of artificial intelligence applications in teaching	110.40	13.41	0.81	60	35.57	0.000	Significant
The second dimension What are the obstacles to using artificial intelligence applications in teaching?	63.50	10.17	0.26	45	25.30	0.000	Significant
The third dimension is what are the incentives that encourage the use of artificial intelligence applications in teaching	53.50	14.34	1.42	36	13.26	0.000	Significant

Table 6. Shows the means, standard deviations, T-value, and its comparison with the hypothesized mean for the scale of attitudes toward the use of artificial intelligence applications in teaching for the theoretical specialization.

Variables	Arithmetic mean	Standard deviation	skewness coefficient	Hypothetical mean	Test T	Sig	Significance
The first dimension is the reality of trends towards the use of artificial intelligence applications in teaching	85.50	10.39	0.20	60	26.07	0.000	Significant
The second dimension What are the obstacles to using artificial intelligence applications in teaching?	45.30	12.84	0.21	45	9.43	0.000	Significant
The third dimension is what are the incentives that encourage the use of artificial intelligence applications in teaching	36.9	7.14	0.74	36	11.79	0.000	Significant

The T-value for the first dimension was (26.07), for the second dimension (9.43), and for the third dimension (11.79).

5. Discussion of results

When analyzing the results of the scale for attitudes toward the use of artificial intelligence applications in teaching, it was observed, as shown in Tables 2 and 3, that the mean values for all three dimensions, in addition to the overall mean for the scale, were higher than the hypothesized mean for both the theoretical and practical specializations. This indicates that the study sample tends to have a positive attitude toward the scale's components.

For the first dimension, the results confirm that the majority of the research sample have positive attitudes toward the use of artificial intelligence applications in teaching. The researchers attribute this to the awareness of faculty members regarding the importance of these applications and their potential benefits in improving the teaching process.

Some researchers, including Al Muslim (2021), affirm through her study conducted on science teachers that there is a positive attitude toward the use of artificial intelligence in teaching.

As for the second dimension, which focuses on the obstacles to using artificial intelligence applications, the researchers attribute the high arithmetic mean—compared to the hypothetical mean—to the participants' awareness of the existence of such obstacles. These may include poor infrastructure, lack of technological resources, or challenges in using the technology itself—factors that can hinder or limit the integration of artificial intelligence applications into the educational process. Experts point out that some of the most significant challenges contributing to the weak implementation of AI in teaching computer science curricula include a shortage of specialists, insufficient funding, and the difficulty of adequately training teachers (Al-Hamidawi, 2024).

The elevated arithmetic mean in the third dimension, compared to the hypothetical mean, can be interpreted as indicating that the research sample perceives the presence of numerous incentives that could encourage the use of artificial intelligence, such as ongoing training, financial support, and the provision of technological devices. These factors may reflect a genuine willingness among the sample to adopt such technologies, provided that the necessary conditions are met. The findings are consistent with a study that emphasized the importance of providing support and incentives in various forms to promote the use of artificial intelligence in teaching (Asdira, 2024).

From the above, it can be said that the higher mean values for all three dimensions compared to the hypothesized mean indicate a high level of awareness among the teachers in both the theoretical and practical specializations about artificial intelligence applications. While recognizing the barriers, there is also a strong motivation to adopt these applications when suitable incentives and support are provided.

Table 4 shows significant differences between the attitudes of teachers in the practical and theoretical specializations, with teachers in the practical specialization showing more positive attitudes across all dimensions, including the overall score of the scale. This suggests that the practical specialization has a more positive attitude toward the use of artificial intelligence in all dimensions.

The researchers explain the differences between theoretical and practical specializations in attitudes toward artificial intelligence by the nature of the subjects, as practical subjects are linked to performance, training, and direct applied activities. This makes artificial intelligence tools more attractive and easier to realize immediate benefits in practical lessons. For example, AI applications can provide movement analysis tools, track performance, and offer immediate feedback to improve sports performance. These benefits make teachers in the practical specialization more inclined to use all related modern

technologies, especially since the practical specialization environment offers better training opportunities and technical support, facilitating technology adoption and reducing barriers to its use.

On the other hand, theoretical specializations often rely on data accuracy and in-depth analysis, which may lead to a more cautious perception of artificial intelligence applications. As a result, greater barriers to use are seen in this area compared to the practical specialization.

Although there are few direct studies comparing practical and theoretical teachers, some research in the sports field has shown that artificial intelligence applications in sports education are used to analyze performance and improve training methods. This supports the idea that teachers in practical subjects may find greater added value from these technologies compared to those in theoretical subjects.

Studies conducted by Venkatesh et al. (2003) indicate that the differences in technology adoption are due to the varying needs and practical environments of each specialization. While practical specializations benefit directly from using technology, theoretical specializations tend to be more cautious due to the nature of their content and analytical needs.

From the above, the researchers attribute the higher adoption of applications by teachers in the practical specialization compared to those in theoretical specializations to the fact that practical teachers find these applications offer practical solutions that support performance improvement.

As mentioned by Miao and Ge (2023), artificial intelligence in the sports field has become an essential part of data analysis, training strategies, and improving athletic performance.

Tables 5 and 6 show that after analyzing the means and comparing them to the hypothesized mean, as well as calculating the differences between the attitudes of teachers in the theoretical and practical specializations using the T-test, the results confirm that several factors influence the formation of attitudes, whether related to educational background, professional experience, or specialization (theoretical or practical). This is supported by the analysis of means and T-test results, which indicate clear and distinct attitudes among the sample members.

A study by Al-Sharif and Farid (2024) about the impact of using artificial intelligence in teaching physical education courses found that AI techniques helped improve sports skills performance and enhanced students' cognitive achievement. These results are statistically significant and warrant further study.

Salman et al. (2024) used an AI program to evaluate the performance of handball goalkeepers, and the results showed the program's ability to provide accurate performance assessments, which helped improve the goalkeepers' skills and performance level.

In karate, Al-Taie and Ghazi (2022) concluded that using artificial intelligence significantly improved sports performance by providing more realistic training environments that mimic competition conditions.

In the field of swimming, several studies have indicated that artificial intelligence has played a significant role in analyzing the start and turn techniques in freestyle swimming. AI has contributed to a better understanding of movement patterns and provided precise data on performance, prompting researchers to recommend the adoption of artificial intelligence technologies in the development of training programs and the analysis of swimmers' motor performance (Afrah, 2024).

Jud and Thalmann (2025) also emphasized that teachers play a crucial role in integrating technology, as they are essential in transmitting knowledge and enhancing athletes' performance. Understanding their attitudes toward artificial intelligence is vital in determining its successful application in sports.

Consequently, studies have indicated that in recent years, artificial intelligence has been applied across various fields in sports and has achieved remarkable success—particularly in biomechanics—where it has demonstrated predictive capabilities in error analysis and decision-making (Al-Zwainy et al., 2024).

6. Conclusions

1. The results of the mean scores indicated that the attitudes of female physical education instructors toward the use of artificial intelligence were positive across all dimensions, including the overall scale score. In most cases, the calculated means exceeded the hypothetical mean, reflecting a clear acceptance of AI integration within the educational process.
2. The results of the *t*-test revealed statistically significant differences between the attitudes of instructors in theoretical and practical specializations, with the advantage in favor of the practical specialization.
3. The findings confirm that attitudes toward the use of artificial intelligence in teaching physical education are influenced by multiple factors, including the nature of the specialization (theoretical or practical) and the extent of familiarity with modern AI applications in the field.
4. These results highlight the importance of strengthening training and professional development programs in artificial intelligence, particularly for instructors who demonstrated

less positive attitudes, in order to ensure equitable opportunities for utilizing modern educational technologies.

7. Recommendations

1. Provide specialized training programs to enhance instructors' skills in using artificial intelligence (AI) applications, with an emphasis on integrating these applications into both practical and theoretical teaching.
2. Encourage the use of AI in practical and theoretical teaching by providing a supportive and stimulating educational environment.
3. Remove obstacles that hinder the use of AI applications and enhance incentives by providing the necessary infrastructure and technologies.
4. Offer motivational incentives to instructors to support the adoption of AI technologies in the educational process.

Author's declaration

The authors formally declare that the content of this paper is the original work of themselves.

Conflicts of interest

None.

We confirm that all tables and figures in this article are ours and written by the researchers themselves.

Ethical Approval

This is an observational study. The Research Ethics Committee of the College of Physical Education and Sport Sciences for Women has confirmed that no ethical approval is required.

Author's contributions

All contributions of this study were done by the researchers

Dr. Intisar: Participated in the experimental aspect.

Dr. Zubaida: Handled the printing and organization of the research methodology.

Asst. Prof. Dr. Dhiffaf Al-Shwillay in revision, Asst. Lect. Noor Riyadh Rahim in translating.

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Data Availability

The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

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Appendix 1

Dimension One: The Current State of Attitudes Toward the Use of Artificial Intelligence Applications in Teaching.

No.	Items	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	My use of artificial intelligence applications will enhance the level of athletic performance.					
2	Using AI applications makes me an outstanding teacher in the future.					
3	AI applications provide innovative models for evaluating students' performance.					
4	AI applications help develop my professional competence and teaching performance					
5	AI applications improve students' creative and innovative thinking					
6	AI applications predict the performance of female students in the future					
7	Artificial intelligence applications reduce students' exposure to injury.					
8	AI applications excite students					
9	I think that artificial intelligence applications will help me follow the performance of students and its competitors.					
10	Artificial intelligence applications contribute to the availability of test data with high accuracy.					
11	AI applications take into account individual differences when planning teaching and training.					
12	Excited to use AI applications in my professional field.					
13	I expect to be skilled in dealing with artificial intelligence applications.					
14	The use of AI applications has become essential.					
15	I believe that AI applications will be a successful communication tool between teachers and students.					
16	I see that artificial intelligence applications reduce the psychological barrier towards competitions anxiety and fear					
17	AI applications will enable students to identify competitors' play patterns and reveal their strengths and weaknesses					
18	Trust AI applications to help make fairer assessment decisions .					
19	Artificial intelligence applications for female students gain digital communication skills.					
20	I see that the use of artificial intelligence applications saves time and effort in teaching and sports training					

Dimension Two: Barriers to Using Artificial Intelligence Applications in Teaching

No.	Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	Lack of conviction among decision-makers regarding the importance of artificial intelligence applications					
2	Insufficiency of Arabic-language applications serving sports education and training in the domain of artificial intelligence					
3	Absence of adequate skill among assistants to interact effectively with artificial intelligence applications					
4	Non-provision of computers or tablets by the sports institution's administration to the technical staff					
5	Lack of sufficient training for teachers in the utilization of artificial intelligence applications					
6	Difficulty in integrating artificial intelligence applications into sports pedagogy and training					
7	Misalignment of available artificial intelligence applications with the teaching methods in use					
8	Absence of adequate skill among assistants to interact effectively with artificial intelligence applications					
9	Non-provision of computers or tablets by the sports institution's administration to the technical staff					
10	Lack of sufficient training for teachers in the utilization of artificial intelligence applications					
11	Utilization of artificial intelligence applications may constitute a distractor for students					
12	Weakness of the foundational technological infrastructure within the sports institution					
13	Incongruence of the technical support provided with teachers' requirements for employing artificial intelligence applications					
14	Insufficient time available to employ artificial intelligence applications in teaching and training					
15	High cost of certain artificial intelligence applications					

Dimension Three: Incentives That Encourage the Use of Artificial Intelligence Applications in Teaching

No.	Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	The sports institution encourages the use of artificial intelligence applications in sports training					
2	The sports institution awards certificates of appreciation to those who utilize artificial intelligence applications in sports training					
3	The sports institution offers professional development courses for users of artificial intelligence applications					
4	The sports institution empowers the coach who employs artificial intelligence applications in training					
5	The sports institution provides the resources necessary to overcome difficulties in using artificial intelligence applications					
6	The sports institution seeks to develop the technical staff's skills in utilizing artificial intelligence applications					
7	The sports institution employs a specialist to assist the technical staff in overcoming difficulties when using artificial intelligence applications with available equipment					
8	The sports institution fosters an environment conducive to the use of artificial intelligence applications					
9	The sports institution offers tangible and intangible incentives to support the adoption of artificial intelligence applications					
10	The sports institution assists me in obtaining smart electronic devices to perform my coaching tasks					
11	The sports institution adopts innovative systems employing artificial intelligence applications					
12	The sports institution provides training courses on the utilization of artificial intelligence applications					
13	The latest artificial intelligence applications used in the sports field are easily accessible					