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The Impact of Computer-Based Learning According to the Practice and Training Method in Teaching Some Offensive Skills in Foil Fencing

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Abstract

The significance of this research emerges from enhancing the skill-based learning level in fencing, with an emphasis on offensive skills in foil fencing, which are considered some of the most difficult skills due to their requirement for precision, high focus, and speed of movement. Accordingly, using the appropriate educational method, such as computer-based learning following the practice and training method, can assist in performing the required movements and consequently improving the learners' proficiency in fencing. The research problem addresses skill performance, particularly offensive maneuvers in fencing, which demand a high level of understanding and focus during execution, as these maneuvers involve speed and precision. This necessitates breaking down the movements electronically via computer and subsequently training on each part through practice. Through this approach, the most challenging parts can be mastered. Based on the researcher's experience in fencing and teaching methods, it has been observed that the learning level of offensive skills in foil fencing does not meet expectations due to the reliance on traditional teaching methods, which may not achieve the educational goal. Therefore, it has become necessary to adopt modern educational technologies through electronic learning programs that help learners understand the components of the movement and apply them through practice and training, which could correct the educational trajectory for the better in learning offensive skills in foil fencing. The research objectives were to identify the impact of computer-based learning according to the practice and training method in teaching some offensive skills in foil fencing. The research concludes that computer-based learning, according to the practice and training method, holds significant importance both theoretically and practically in teaching some offensive skills in foil fencing. Recommendations of the research strongly emphasize the adoption of computer-based learning, integrating both theoretical and practical training approaches, due to its significant importance in teaching offensive skills in foil fencing. and this achieves one of the sustainable development goals of the United Nations in Iraq which is (Quality Education).

Keywords | **Computer-based learning, practice and training method, foil fencing.**

Introduction:

Most developed countries place significant emphasis on education, recognizing it as the foundation for building the state and its various institutions. This focus is reflected in the modernization of curricula, the provision of a suitable learning environment, and the adoption of educational methods and tools that align with the student's level of understanding. This emphasis on education is not confined to a single

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field but extends across multiple domains, tailored to the learner's experiences and interests. The goal is to motivate learners to excel and progress, enhancing their future capabilities and contributing to development and advancement based on what they have learned.

In the field of sports, which is one of the areas where scientists aim to develop through teaching various sports sciences, education serves as a tool to help learners understand the game, acquire performance skills, and achieve a higher level of educational and athletic accomplishment. For this reason, there has been a growing need to adopt suitable teaching methods and techniques, such as computer-based learning according to the practice and training method. This approach is considered optimal, especially in sports education, as it helps clarify educational plans and movement components, and applies them through signals and symbols displayed on the computer. The learner is required to manipulate these symbols to understand the appropriate and effective movements. According to Saleh Salem Ali (2015), "computer-based learning is a self-instructional mode that relies on software as a medium incorporating models, forms, and cognitive information" (6). Most researchers agree on the importance of computer-based learning and its role in enhancing education across various sports and other sciences. Among them are Ibrahim Abdul Kareem Al-Far (2002), Mohammed Al-Tawalbeh and Amer Al-Jizawi (2004), Omar Amair (2009), and Mohnsen, B (2001), who stated that "this type of programmed technical software offers learners the opportunity to learn according to their abilities, while also allowing them to continuously assess themselves. Learners can confirm the accuracy of their responses after each attempt, and they cannot progress from one frame to another or from one part to the next until they have mastered the previous part in accordance with the program's sequence" (1) (12) (10) (14). Additionally, computer-based learning is considered "a form of education that utilizes educational software designed to present content in an engaging manner, guiding the learner step by step towards mastery. Learners can engage with this type of learning independently, either within the classroom as a reinforcement tool or outside the classroom for self-directed learning. According to a study by Abdullah Al-Mousa et al., computers can act as personal tutors for each student by following various instructional methods, most notably individual tutoring, practice and training, problem-solving, simulation, educational games, and dialogue" (9). From this perspective, computer-based learning can achieve multiple educational goals across various sports, including fencing, which is an individual sport that requires mastering both offensive and defensive skills before being practiced. This mastery can only be attained through the use of modern educational technologies, such as computer-based learning combined with appropriate teaching methods like practice and training, which are considered essential approaches. After gaining theoretical understanding through the computer, practical application and learning become necessary. The importance of this research lies in the need to improve skill education in fencing, particularly the offensive skills with the foil, which are among the most challenging skills. These skills require precise movements, high concentration, and quick execution. Therefore, using the appropriate educational approach, such as computer-based learning according to the practice and training method, can help implement the required movements, thereby enhancing the skill level of learners in fencing. The research problem is that skill performance, especially offensive skills in fencing, requires deep understanding and focus during execution, as these movements are characterized by speed and accuracy. To master these movements, they must first be broken down electronically using the computer, followed by training on each part individually and applying them in practice. This approach allows for the mastery of the most difficult aspects of the skill. Based on the researcher’s experience in fencing and teaching methods, it was observed that the level of learning offensive skills with the foil does

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not meet the desired expectations, mainly due to the reliance on traditional teaching methods that may not achieve the intended educational goals. Therefore, it has become essential to rely on modern educational technologies, using electronic learning programs that assist learners in understanding the components of the movement and applying them practically through practice and training. The practice and training method is one of the most commonly used methods in the educational field, relying on the computer as an auxiliary tool in traditional educational units to solve a specific problem through repeated training. As highlighted in the study by Nahida Abd (13), "this method adds another element to effective learning, which is the element of learner training." Thus, the educational process can be improved to enhance the learning of offensive skills with the foil.

Research Objectives:

1. **To identify the differences** between the pre- and post-test results of both the control and experimental groups in teaching some offensive skills with the foil to students.
2. **To identify the differences** in the post-test results between the control and experimental groups in teaching some offensive skills with the foil to students.

Research Hypotheses:

1. **There are significant differences** between the pre- and post-test results for both the control and experimental groups in teaching some offensive skills with the foil to students.
2. **There are significant differences** in the post-test results between the control and experimental groups in favor of the experimental group in teaching some offensive skills with the foil to students.

Research Fields:

- **Human field:** Third-year students at the College of Physical Education and Sports Sciences at the University of Basra, with a total of 185 students.
- **Spatial field:** The fencing hall at the College of Physical Education and Sports Sciences - University of Basra.
- **Temporal field:** The period from 11/2/2024 to 16/4/2024.

Methodology and Procedures:

Research Methodology:

The researcher used the experimental method with two equivalent groups (control and experimental) due to its importance in addressing the research problem. According to Haider Abdul Razzaq Kadhim (2015), "Experimentation seeks to find the cause and how it occurs. The researcher studies the variables of the phenomenon, intentionally altering some while controlling others to examine their effect on one or more dependent variables, ultimately determining the causal relationships between the independent and dependent variables" (3).

Research Population and Sample consisted of third-year students, totaling 185 students. The sample was selected intentionally, comprising 20 students from a single group, representing 10.81% of the population. The sample was divided into two groups: **experimental group:** Comprising 10 students and **control group:** Comprising 10 students.

Both groups were balanced and ensured to be homogeneous, as shown in Table (1).

Table .1 It illustrates the arithmetic means, standard deviations, coefficient of variation, and t-test for achieving homogeneity and equivalence in the research variables:

Measurement and Evaluation	Control Group			Experimental Group			Tabulated (T) value	Significance Level
	Arithmetic Mean	Standard Deviation	Coefficient Variation	Arithmetic Mean	Standard Deviation	Coefficient Variation		

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Length/Cm	170.56	1.784	1.045	170.66	1.996	1.169	0.112	Non-significant
Weight/Kg	71.45	0.865	1.21	71.62	0.896	1.251	0.409	Non-significant
Thrust/Degree	3.452	0.445	12.891	3.67	0.587	15.994	0.889	Non-significant
Direct straight attack/Degree	3.452	0.635	18.395	3.512	0.586	16.685	0.208	Non-significant
Attack with change of direction.	3.745	0.574	15.327	3.845	0.574	14.928	0.37	Non-significant
Numerical attack	4.325	0.684	15.815	4.769	0.565	11.847	1.5	Non-significant

The tabulated t-value at a degree of freedom (18) and a significance level of (0.05) is equal to 1.724.

Methods of Data Collection:

-Arabic and foreign sources.
-Scientific observation.

Equipment and Tools Used:

-Stopwatch.
-Fencing arena.
-Nine (9) foil weapons.
-Measuring tape.
-Medical scale.
-Computer.
-Floppy disks.

Field Research Procedures:

Determining Research Variables: The research is based on the educational curricula of the fencing subject taught in the Colleges of Physical Education and Sports Sciences at the University of Basra. The following offensive skills were selected:

1. Thrust
2. Direct straight attack.
3. Attack with change of direction.
4. Numerical attack

Evaluation of Performance:

After identifying the research variables, a standardized evaluation form developed by other researchers was adopted, which consists of three sections: the preparatory phase, the main phase, and the concluding phase. The performance of the sample participants was assessed through direct observation by the evaluators, who explained the steps of each phase and assigned appropriate scores. The preparatory section receives 2 points, the main section receives 5 points, and the concluding section receives 3 points, resulting in a total evaluation score of 10 points for each learner (4) Appendix (2).

Pilot Study:

The researcher conducted a pilot study on February 11, 2024, involving a sample of the same students to standardize computer-assisted instruction by presenting an overview of each skill and demonstrating how to apply these skills through the exercises used. The aim was to assess the difficulty level of these skills for the sample participants, as well as the required repetitions and the time taken to complete the exercises.

Field Experiment:

Pre-Tests: The preliminary tests were conducted on February 18, 2024.

Computer-Assisted Learning:

The researcher developed a computer program that includes information on the movements and attacks specific to the saber in fencing. This program requires practice and training before performance in the assessments or providing indicators for the correct movements.

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The computer program includes the following components:

1. Explanation and clarification.
2. Practice and training.
3. Software designed to foster creativity, innovation, and scientific thinking.
4. Educational games.
5. Simulation.

Through this software, initial theoretical learning is conducted, followed by practical application during a complete lesson divided into three sections (see Appendix (1)). The duration of the educational unit is eight weeks, with a total of 90 minutes allocated as follows: the preparatory section (25 minutes), the main section (60 minutes)—comprising 20 minutes for instruction and 40 minutes for practical application—and the concluding section (5 minutes). The program was implemented from February 19, 2024, to April 15, 2024.

Post-Tests: The post-tests were conducted on April 16, 2024.

Statistical Methods: The SPSS system was used for statistical analysis to find the following:

1. Mean 2. Standard deviation 3. Coefficient of variation 4. Paired samples t-test 5. Independent samples t-test 6. Percentage

Results:

Table .2 shows the pre-test and post-test values (t) for the control group in the evaluation used.

Evaluation Used	Arithmetic Mean		Standard Error	Tabulated (T) value	Significance Value
	Post-test Mean	Pre-test Mean			
Thrust/Degree	3.452	5.534	0.894	2.328	Significant
Direct straight attack /Degree	3.452	5.784	0.886	2.632	Significant
Attack by changing direction / Degree	3.745	6.012	0.891	2.544	Significant
Numerical attack/Degree	4.325	7.052	0.996	2.737	Significant

The Tabulated Value (T) at degrees of freedom (9) and a significance level of (0.05) is equal to 1.833

Table .3 shows the pre-test and post-test values (t) for the control and experimental groups in the evaluation used

Evaluation Used	Arithmetic Mean		Standard Error	Tabulated (t)Value	Significance Value
	Pre-Arithmetic Mean	Post Arithmetic Mean			
Thrust / Degree	3.67	7.674	1.132	3.537	Significant
Direct Straight attack Degree	3.512	7.325	0.991	3.847	Significant
Attack by Changing Direction / Degree	3.845	8.145	1.421	3.026	Significant
Numerical Attack/Degree	4.769	9.114	1.351	3.216	Significant

The tabulated value (T) at degrees of freedom (9) and a significance level of (0.05) is equal to 1.833

Table .4 shows the post-test values (T) between the control and experimental groups in the evaluation used

Evaluation Used	Control Group		Experimental Group		Tabulated (T) Value	Significance
	Arithmetic Mean	Standard Deviation	Arithmetic Mean	Standard Deviation		
Thrust /Degree	5.534	0.867	7.674	0.914	5.107	Significant
Direct Straight Attack /Degree	5.784	0.796	7.325	0.974	3.677	Significant

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Attack by Changing Direction / Degree	6.012	0.969	8.145	0.937	4.75	Significant
Numerical Attack/Degree	7.052	0.997	9.114	0.964	4.463	Significant

Table Value (T): The table value of (t) at 18 degrees of freedom and a significance level of (0.05) is 1.724.

Discussion:

After presenting the evaluation results in Tables (2) and (3), it is evident that there is learning and improvement in the offensive skills with the foil weapon for both the control and experimental groups. According to Table (4), we can infer that the experimental group outperformed the control group due to the use of computer-assisted learning techniques in addition to practice and training that precedes the actual application of the performance skills under study. Overall, the effectiveness of teaching for both groups results from employing correct methods and approaches, as well as the students' commitment to applying the lessons in a scientific and effective manner. This scientific exchange between the student and teacher is essential for achieving fruitful results. Mosston (1999) notes that "effective teaching relies on the interaction and connection between two primary variables: the teacher's behaviors in the instructional style and the degree of student engagement in participation. Instructional behavior depends on the resources available in the school environment, the students' level, their educational stage, and their learning capabilities. Additionally, student performance is influenced by what they receive during the lesson in terms of skillful and cognitive information, as well as their engagement in utilizing actual academic learning time for specialized physical activities in physical education" (15).

According to Qassem Lazam Sabr (2005), "learning within an educational curriculum that is applied objectively leads to an increase in learning and consequently a development of skills in both cognitive and skillful aspects" (11).

Regarding the experimental group, the role and importance of computer-assisted learning can be highlighted as Ismail Al-Rifai (2006) asserts that "computer programs increase student engagement in learning" (2). On the other hand, Saleh Salem Ali Al-Qawqazah (2015), citing Salem (2001), states that "there are advantages to using software in the field of learning, as it provides students with freedom, stimulates their enthusiasm, encourages them to continue learning, and offers immediate feedback through the software, thereby shortening the learning time" (6).

Both Sadiq Al-Haik and Suha Adeeb (2006) confirm that "the introduction of computers into the educational process equips students with new skills that improve learning outcomes" (7).

Finally, the success of teaching basic skills under study is attributed to the scientifically designed program that encompasses both theoretical and practical aspects, built correctly. As Saad Mohsen Ismail (1996) observes, "the educational program necessarily leads to improved performance if it is based on scientific principles for organizing and programming the teaching process, using suitable methods that gradually increase in difficulty, while considering individual differences, as well as utilizing effective teaching aids, all under the supervision of specialized trainers in conducive educational conditions regarding time, place, and equipment" (5).

Furthermore, Dhaher Hashim Ismail (2002) emphasizes that "it is a natural phenomenon in the learning process that there must be progress in learning as long as the teacher follows the essential and systematic steps for teaching, training on correct performance, and focusing on continuous attempts and repetitions until the performance is solidified and stabilized" (8).

Conclusions:

1. Computer-based education, utilizing a practice and training approach, is of significant importance in teaching certain offensive skills in fencing for students,

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encompassing both theoretical and practical aspects.

2. Self-directed and autonomous learning through computer use offers numerous advantages, including granting the students freedom, fostering their enthusiasm, enhancing learning continuity, and providing immediate feedback through software, which contributes to reducing learning time.

Recommendations:

1. It is recommended to adopt computer-based teaching methods according to the practice and training approach in both theoretical and practical dimensions, given its substantial importance in teaching certain offensive skills in fencing for students.
2. Emphasis should be placed on the significance of self-directed and autonomous learning through computer use, as it provides multiple benefits, such as empowering students with freedom, motivating them to persist in their learning, delivering immediate feedback via software, and reducing the time required for learning.

Author's declaration:

Conflicts of interest: None

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

Ethical-Clearance: this manuscript approved by local ethical committee of physical education and sport sciences college for women on (September /2024)

Author's contributions:

All contributions of this study were done by the researcher (A.R.) who get the main idea and work on writing and concluding also with number of experts, Khalaf Mutashar (Al-Basrah education directorate) in Statistics, Manal Bayyat in revision, Nibal Ahmed in translating, Huda Shihab in proofreading

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Appendix (1) Form (from the Educational Units)

Unit Objectives: Learn the basic offensive skills of fencing

First Week

1-Educational Unit

Unit Sections	Time	Details & Exercises	Repetitions	Observations
Preparatory Section	25 minutes	Attendance Registration - General Warm-Up Specific Warm-up		
Main Section: 1. Educational	60 minutes 20 minutes	1-Develop a computer tutorial with an explanation of the basic offensive skills with a foil weapon. 2- Placing homework on a floppy disk on the basic offensive skills with the foil weapon. 3-Develop questions and answer them with a computer on the basic offensive skills with a foil weapon.		- Emphasis on the educational Computer Theory Aspect - Ensure the implementation of educational homework on the computer.
2. Applied	40 minutes	1- Performance of each case of offensive skill in an imaginary kinetic manner, with a reminder of what he learned and applied on the computer	3×12	
		2- Performing offensive skills effectively with the colleague	3×12	
		3- Perform legal play for offensive skills and correct errors	3×12	
Concluding Section	5 min	Relaxing, breathing and fulfilling tasks		

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تأثير التعليم بالحاسوب وفقا" لطريقة الممارسة والتدريب في تعليم بعض المهارات الهجومية بسلاح الشيش

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مستخلص البحث

تأتي اهمية البحث في رفع مستوى التعليم المهاري برياضة المبارزة وخاصة المهارات الهجومية بسلاح الشيش التي تعد من اصعب المهارات كونها تتطلب حركات عالية الدقة والتركيز والسرعة في الحركة ولهذا فان استخدام الاسلوب التعليمي المناسب مثل التعلم بالحاسوب وفقا" لطريقة الممارسة والتدريب ربما تساعدنا في تطبيق الحركات المطلوبة وبذلك يمكن النهوض بمستوى المتعلمين في رياضة المبارزة. وكانت مشكلة البحث : يعتبر الاداء المهاري وخاصة الهجومية في رياضة المبارزة من المهارات التي تتطلب الفهم والتركيز في الاداء كونها من الحركات فيها السرعة والدقة في التنفيذ مما يتطلب تجزئة الحركة الكترونيا وفق الحاسبة وبعدها التدريب على كل جزء والممارسة في التطبيق وهنا يمكن اتقان اصعب الاجزاء فيها . وحسب خبرة الباحث في رياضة المبارزة وطرائق التدريس والتعلم لاحظ ان مستوى تعلم المهارات الهجومية بسلاح الشيش لا ترتقي نحو الطموح بسبب الاعتماد على الطرائق التدريس المألوفة والتي ربما لا تحقق الهدف التعليمي مما يتطلب الاعتماد على التقنيات الحديثة في التعليم وفق برامج تعليمية الكترونية تساعد المتعلم على فهم اجزاء الحركة وتطبيقها وفق الممارسة والتدريب وهنا يمكن تصحيح المسار التعليمي نحو الافضل في تعلم المهارات الهجومية بسلاح الشيش. وكانت اهم أهداف البحث:-التعرف على تأثير التعليم بالحاسوب وفقا طريقة الممارسة والتدريب في تعليم بعض المهارات الهجومية بسلاح الشيش.وكانت اهم الاستنتاجات : التعليم بالحاسوب وفقا" طريقة الممارسة والتدريب من الناحية النظرية والتطبيقية له اهمية كبيرة في تعليم بعض المهارات الهجومية بسلاح الشيش ،وتم التوصية ب : اعتماد التعليم بالحاسوب وفقا" طريقة الممارسة والتدريب من الناحية النظرية والتطبيقية لما له من اهمية كبيرة في تعليم بعض المهارات الهجومية بسلاح الشيش. وهذا ما يحقق احد اهداف التنمية المستدامة للامم المتحدة في العراق (التعليم الجيد).

الكلمات المفتاحية | **التعليم بالحاسوب، طريقة الممارسة والتدريب ، سلاح الشيش**