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The Effect of Artificial Intelligence Techniques on Motor Interaction and Its Relationship to Some Offensive Skills in Kickboxing (Educational Robot)

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Abstract: The importance of the study is to develop the technological education system in teaching offensive skills in kickboxing. The use of artificial intelligence techniques in the educational process. Developing a kinaesthetic learning system and a kinaesthetic reaction, the study aims at "the effect of artificial intelligence techniques on the motor reaction and its relationship to some offensive skills in Kickboxing (educational robot)". The study method the researcher used the experimental method. The study sample was from kickboxing players in Kafr El-Sheikh Kickboxing region by choosing the study sample in a random way for Kickboxing players, where Their number reached (20) players who have obtained a black belt, Dan (1), reached the conclusions. Teaching using the learning robot leads to an evolution in the student's learning levels in learning offensive skills in kickboxing. Teaching using technology leads to the development of the motor reaction of the skills intended. Teaching using technology, artificial intelligence methods, and neural networks is characterized by flexibility and speed of motor reaction. The recommendations came to provide the necessary technological devices and tools to work in the faculties of physical education and sports, and to provide schools with all communication requirements The International Network for Information and interest in presenting studies dealing with the use of technology in teaching physical education.

Keywords: Artificial Intelligence, An Educational Robot, Kickboxing

1. Introduction

The rapid change and scientific progress in all aspects of life has obligated educational and training institutions to adopt modern learning methods and modern training through the mathematical analysis system. To a high degree that qualifies it to face the challenges of the times, and among these modern means are programs based on artificial intelligence and its link to the emotional side of the learner. [7], Artificial Intelligence is a field of computers that focuses on developing hardware and software systems that contribute to solving problems and completing tasks that, if completed by humans, would be considered a kind of intelligence. As theories and applications in the field of artificial intelligence lead to the development of a wide range of artificially intelligent tools, capable of solving or helping to solve many problems, and thus the importance of artificial intelligence becomes clear to students, teachers and the educational system in general [5] From this standpoint, teaching and training programs based on artificial intelligence have emerged in order to support and confirm the importance of artificial intelligence in analysing and evaluating skills and to present needs that cannot be met by the traditional methods used for traditional computer teaching programs. [6] The development in kinaesthetic learning prompted an attempt to explore alternative models for the art of teaching and learning and for the methods that are followed, so that this fine art can be advanced in light of the laws and circumstances that may be adverse in many cases against the current curriculum current [8].

Abu Bakr (2013) confirms: Artificial intelligence is a

relatively recent field that has arisen as one of: simulating the human mind, computer science that is concerned with studying and understanding the nature of human intelligence and simulating it to create a new generation of smart computers that can be programmed to accomplish many tasks that need high capacity. From deduction, deduction, and perception, which are qualities that a person enjoys and fall within his list of intelligent behaviour's that a machine could not have acquired before. Some studies, such as the study [6] indicate that the use of artificial intelligence technology in teaching and training the sciences of physical education, especially in educational skills in the field of physical education and The integration of smart teaching systems and the development of feedback mechanisms to simulate the natural educational environment contribute to the development of learning and training systems, and take into account both individual needs and requirements. The feedback should be consistent, as much as possible, with the learner's personality and special needs.

2. Methods

Therefore, the researcher resorted to the existence of a proposed vision that keeps pace with the digital age and technological progress, and seeks to align with digital development in general, and in the sport of kickboxing in particular, and a vision that accompanies the ability to respond to the actions issued by the individual and agrees with the motor reaction of the educated person and seeks to communicate Educational content in a scientific and practical way and work to develop the educational material system and increase the efficiency of the educational material in motor skills and methods consistent with this development.

2.1. The Importance of Studying

1) Developing the technological education system in teaching offensive skills in the sport of kickboxing.
2) The use of artificial intelligence techniques in the educational process.
3) Developing the motor learning system and the motor reaction.

2.2. Objectives of the Study

The study aims at "the effect of artificial intelligence techniques on the motor reaction and its relationship to some offensive skills in the sport of kickboxing (educational robot)".

2.3. Study Questions

1) What are the offensive and defensive skills in kickboxing?
2) What are the methods used in designing a robot using an artificial intelligence method to measure the motor reaction?

2.4. Terminology of Study

Artificial intelligence: Artificial intelligence is one of the branches of computer science, and it is defined as certain characteristics and behaviour that are distinguished by computer programs that make it simulate human mental capabilities and work patterns. Design and study smart customers [2].

Educational robot: Educational robot programs are programs through which the individuals involved are motivated by creating innovations, designed from different materials and controlled by a computer system. Each robot project consists of several things, the most important of which are: design and programming of the processor to carry out certain commands. [1-15]

3. Procedures

3.1. Study Methodology

The researcher used the experimental method due to its suitability to the nature of the study.

3.2. Study Sample

The researcher determined the study population of kickboxing players in Kafr El-Sheikh Kickboxing District by randomly selecting the study sample as kickboxing players, whose number reached (20) players.

3.3. How to Deal with Educational Robots and Artificial Intelligence Methods

The instructional designer uses educational strategies as principles, where the strategies interact with learning situations, the nature of the content, and the desired type of learning to deal with the motor reaction to the skills and resources to be learned [10].

Al-Shami (2020) also mentioned that robots in education employ learner-centered strategies such as: cooperative learning strategy, self-learning, discussion, problem-solving, discovery, use of educational games, and motor reaction speed, as robot education and programming requires the learner to obtain the limit. The lowest level of education and the highest level of learning. And making use of it in the educational context in general and the sport of kickboxing in particular, and what it contains of small games, introductory games and other games in the sports and educational skills of the educational content of the subject [4].

The researchers asserts: The robot is one of the most important developments in the field of educational technologies, produced through artificial intelligence methods and digital sabbaticals, which are spreading in the educational community. Because of the endless possibilities it provides, teachers have noticed how computers and peripherals such as robots in education make the classroom a learning environment characterized by a high level of interaction and encourage learners to work as members of one team.

4. Design and Implementation Procedures in Educational Robot Work

An artificial intelligence robot based on voice interaction has been designed and introduced into the teaching of physical education classes to assist teachers in sports teaching activities.

First, the voice interaction system is designed, and the speech recognition accuracy is improved by the algorithm. Next, the teaching method of physical education is drawn up. Combined with the advantages of traditional physical education and intelligent information technology, a personalized and intelligent physical education mode has been created. Finally, the physical education teaching mode is tested, and the effect of sports teaching before and after the introduction of the robot is evaluated through a questionnaire survey. This study can provide a reference for promoting the new mode of intelligent and personalized teaching in the classroom.

1) The skill to be taught has been programmed through the educational robot in Figure 1.

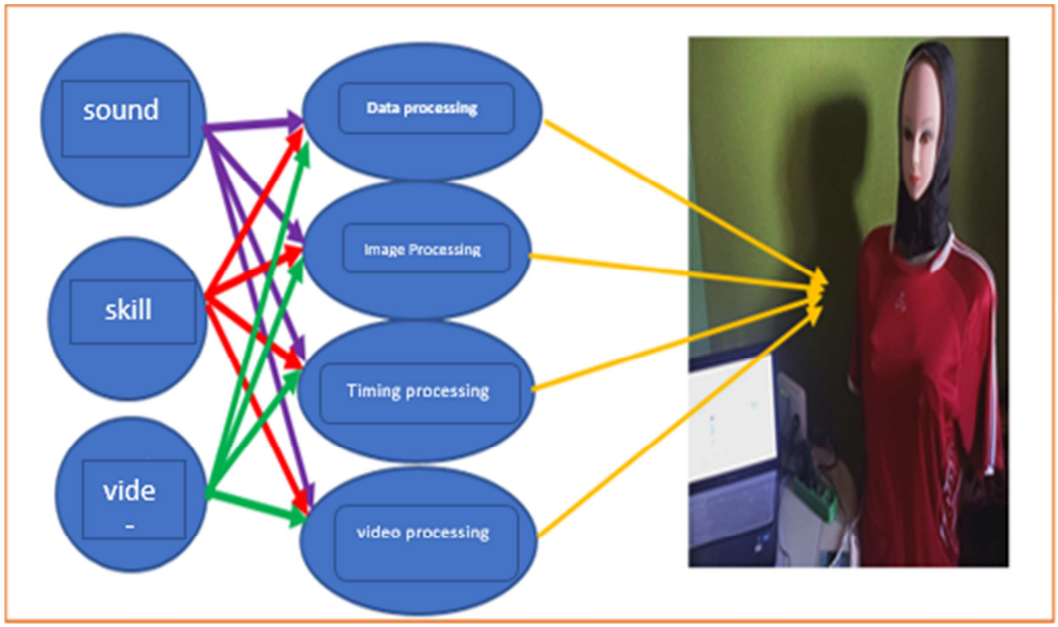

Figure 1. *Data entry on the robot.*

2) The educational robot is connected to the computer so that the educational content is displayed through the screen and it can also be displayed via the Zoom program until the hybrid education system is achieved.

The interaction with the educational robot lies through speaking during the presentation of the lesson or the skill to be taught, and through interaction or speaking in the presence of artificial intelligence methods and techniques. Words are recorded through the program (Speech recognition module).

a) Significant No. (1) the sound emanating from the educational robot.
b) Significant No. (2) the kinetic image conveyed by the educational report through the vocal and kinetic interdependence of the display screen.
c) Significant No. (3) the written text that agrees with the voice movement of the skill to be taught, the procedures of artificial intelligence techniques.

In the work of the educational robot using the method of neural networks (ANN).

An artificial neural network (ANN) is an artificial intelligence technology inspired by the way the human brain works, consisting of neurons.

4) Known as "processing elements", "nodes" or "modules". It is usually organized into layers: input layer, output layer, and layer.

One or more arguments called hidden classes. Each unit in a given layer is wholly or partly connected to many nodes in other layers of the layer.

An arithmetic procedure malfunction with a recurring dynamic.

The typical form of these networks is at least three neural layers called (input layer, hidden layer, and output layer). information) the hidden layer and then the hidden layer feeds into the output layer. The actual processing of data takes place in the hidden layer and the output layer.

Note: The existing image (1-2) is an innovative electronic device registered with a patent at the Academy of Scientific Research, Egypt. Patent No. (507/2017).

Statistical Analysis

(The arithmetic mean, standard deviation, Chi-square (x2), Mediator and skewness were analysed with SPSS 10.0.

5. Results

What is the method used in teaching physical education using artificial intelligence methods?

(1) The technical requirements used in the use of the robot.

Table 1. *Technical requirements used in using the robot.*

The first axis	Mean (M)	standard deviation (SD)	Chi Square (a)
Technical requirements used in using the robot	9	0.67	90.36*

Note: α = Cronbach's Coefficient Alpha, M = Mean; SD = Standard deviation
Source: Authors

The results of table 1 In the following table, it is shown (1) that the percentage of (Chi Square) reached (90.36%), which is a high percentage, and this indicates that the study sample agreed on the standards in the first axis (technical requirements used in using the robot) Appendix (No. 1).

Through this questionnaire, it is clear that the development of a dynamic, intelligent and high-performance educational robot. Students can understand the basic materials and automated tools of humanoid robots in the practice process, which can help students improve their interest in course learning and master skills through the different proportions of the learning process from helping, reading and practicing, and this is consistent with [3, 4, 9, 10, 13].

What are the methods used in designing a robot using artificial intelligence?

(2) Educational robot.

The results of table 2, it is clear that the percentage of (Chi Square) reached (95.36%), which is a high percentage, and this indicates that the study sample agreed on the standards in the second axis (educational robot) Figure 2 Through this, it is clear that the improvement of recognition accuracy To speak by algorithm. Next, the teaching method of physical education is drawn up. In addition to the advantages of traditional physical education and smart information technology and the ability to develop the education system and the ability to employ digital content in the education process, this is consistent with [1, 3, 9, 10, 14].

Table 2. *Educational robot.*

The second axis	Mean (M)	standard deviation (SD)	Chi Square (a)
Educational robot	9.01	0.487	95.06*

Note: α = Cronbach's Coefficient Alpha, M = Mean; SD = Standard deviation
Source: Authors

Third axis

(3) Offensive skills in kickboxing.

Table 3. *The homogeneity of the study sample in abilities and offensive skills (out of = 20).*

Test	The unit of measure	Mean (M)	standard deviation (SD)	Mediator (M1)	Skewness (SK)
Jab	seconds of time	43.6	1.43	43.3	0.001-
cress		45.4	1.49	44.7	0.060
fornt kick		45.1	1.39	44.1	0.060-
Round house kick		43.4	1.31	44.1	0.060-

Note: α = Mean (M), standard deviation (SD), Mediator (M1), skewness (SK)
Source: Authors

The results of table 3: that the values of the torsion coefficient are limited to (0.001-:- 0.356) and that they all revolve around zero, which indicates that all the sample members fall under the moderate curve in physical abilities, which indicates the homogeneity of the research sample members in the selected variables.

The following table shows the relationship between motor reaction speed and skill performance level.

Table 4. *The relationship between motor reaction time (performance level).*

Skills	Average motor reaction time (RT)	Average skill performance time (SPT)
Jab	1.398	33.866
cross	1.521	53.137
front kick	1.030	53.220
Round house kick	0.918	44.684

Note: S= Skills under study, (RT) Average motor reaction time, (SPT) Average skill performance time
Source: Authors

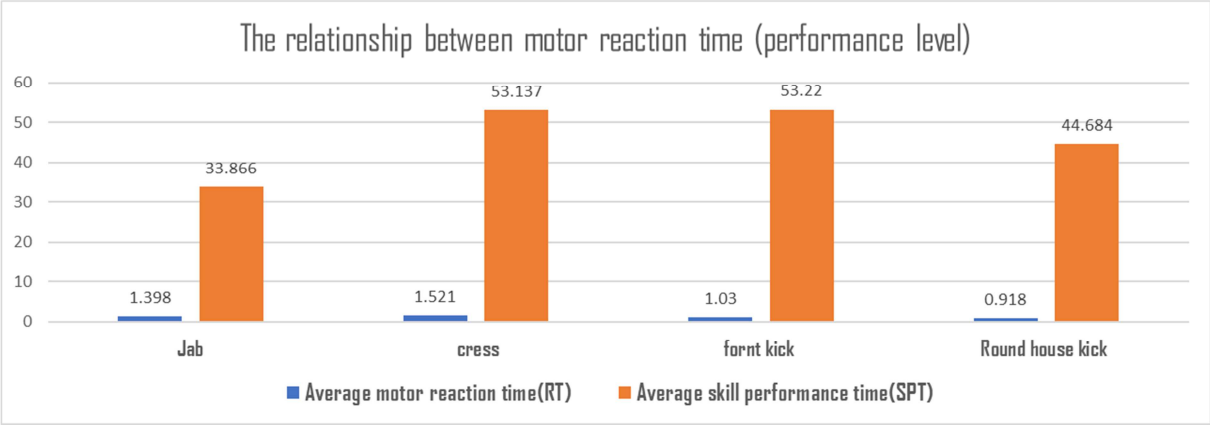

Figure 2 *Relationship between the time of the motor reaction and the level of response (the level of skillful performance).*

The results of table 4 and Figure 2, there is an inverse relationship between the time of the motor reaction and the level of response (the level of skillful performance). Jab (33.866), (1.398), Cross (1.521 – 53.173), Front kick (1.03-53.22), Roundhouse kick (0.918-44.684), Dariusz Gierczuk and Zbigniew Bujak (2016) confirm: The link between response speed and motor performance in most sports activities is one of the basic requirements for the success of motor work; Especially since any motor performance requires a quick response that results in a good reaction and a correct motor response, which leads to a correct skillful performance.

6. Discussion

Scientific progress in all aspects of life has obligated educational and training institutions to adopt modern learning methods and modern training through the mathematical analysis system. To meet the challenges of the times. [6], Artificial intelligence is the development of hardware and software systems that contribute to solving problems and completing tasks that, if completed by humans, would be considered a kind of intelligence. [5], From this standpoint, teaching and training programs based on artificial intelligence have emerged in order to support and confirm the importance of artificial intelligence in anal Scientific progress in all aspects of life has obligated educational and training institutions to adopt modern learning methods and modern training through the mathematical analysis system. To meet the challenges of the times. [7], Artificial intelligence is the development of hardware and software systems that contribute to solving problems and completing tasks that, if completed by humans, would be considered a kind of intelligence. [6-13], From this standpoint, teaching and training programs based on artificial intelligence have emerged in order to support and confirm the importance of artificial intelligence in analysing and evaluating skills and to present needs that cannot be met by the traditional methods used for traditional computer teaching programs. The development in kinaesthetic learning prompted an attempt to explore alternative models for the art of teaching and learning and for the methods that are followed, so that this fine art can be advanced in light of the laws and circumstances that may be adverse in many cases against the current curriculum current [8], confirms [4] Artificial intelligence is a relatively recent field that has arisen as one of: simulating the human mind, computer science that is concerned with studying and understanding the nature of human intelligence and simulating it to create a new generation of smart computers that can be programmed to accomplish many tasks that need high capacity. From deduction, deduction, and perception, which are qualities that a person enjoys and fall within his list of intelligent behaviours that a machine could not have acquired before. analysing and evaluating skills and to present needs that cannot be met by the traditional methods used for traditional computer teaching programs. The development in kinesthetic learning prompted an attempt to explore alternative models for the art of teaching and learning and for the methods that are followed, so that this fine art can be advanced in light of the laws and circumstances that may be adverse in many cases against the current curriculum current (Ahmed, 2010, page 1), Abu Bakr (2013) confirms: Artificial intelligence is a relatively recent field that has arisen as one of: simulating the human mind, computer science that is concerned with studying and understanding the nature of human intelligence and simulating it to create a new generation of smart computers that can be programmed to accomplish many tasks that need high capacity. From deduction, deduction, and perception, which are qualities that a person enjoys and fall within his list of intelligent behaviour's that a machine could not have acquired before, This is consistent with [1, 3, 9, 10] All Muhammad Assem confirms: The degree of closeness or similarity of this performance with the most logical or ideal individual models of the technique, and standing on the effectiveness of skilful performance requires the need to compare the main characteristics of the movement technique either with an ideal logical biomechanical model or with an individual model for the performance technique of one of the prominent world champions in this Kind of sports competitions, or in the sport of kickboxing. This is consistent [1, 5, 6, 8, 11, 12, 16].

7. Conclusions

1) Teaching using the educational robot leads to a

development in the student's learning levels in learning offensive skills in the sport of kickboxing.
2) Teaching using technology leads to the development of the motor reaction to the skills to be taught.
3) Teaching using technology, artificial intelligence methods, and neural networks is characterized by flexibility and speed of motor reaction.

8. Recommendations

1) Providing the necessary technological equipment and tools to work in the faculties of physical education and sports.
2) Providing schools with all the requirements for connecting to the international information network, and showing interest in presenting studies dealing with the use of technology in teaching physical education.

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