

Pervasive learning and its impact on cognitive development and learning of freestyle swimming skills in sports sciences students

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ABSTRACT

The spread of the electronic system of knowledge among students and universities has led to the emergence of new forms of educational systems called pervasive learning. This is an educational system that uses wireless computer and telecommunications techniques, portable devices, and teaching techniques in an educational and training context and is an advanced system for the mobile learning system. The aim of this study was to prepare educational units with pervasive learning model to teach the basic skills of free swimming and also to identify the effect of pervasive learning model in learning free swimming skills. The researcher used the experimental study design. The research sample consisted of 20 students of the Faculty of Physical Education and Sports Sciences of Al Basrah University. The students were divided into two groups (10 students for the control group and 10 students for the experimental group). To achieve the objectives of the study, 5 tests about free swimming skills were performed. In order to analyze the data, T-test was used to analyze the differences between control and experimental groups for all free swimming skills tests. The results showed that there are statistically significant differences between the control and experimental groups in all free swimming skills tests, in favor of the experimental group ($p < 0.05$). Through this study, it has been revealed that the educational units that used the pervasive learning model had a positive impact on the development of basic skills in free swimming.

KEYWORDS

Pervasive learning; Freestyle swimming; Students

1. INTRODUCTION

Our present time is characterized by rapid changes caused by scientific and technological progress and information technology, and many methods in education have changed, especially with the emergence of the technological revolution in IT and the auspices of the so-called information technology, which means access to information, processing, storage, recruitment and use of electronic devices.

The various forms of IT include: satellite communication, digital telephone networks, multimedia computers, interactive video conferences, CDs, local and international computer networks. This development has led to the spread of electronic knowledge among students to the emergence of new forms of educational systems known as pervasive learning.

Lee (2013) describes pervasive learning as follows: "An educational system that uses diffuse computing techniques, telecommunications, portable devices, and teaching technologies in an educational and training context, and is an advanced system for the mobile learning system". According to Srilaphat & Jantakoon (2019), pervasive learning is "an educational model where trainees can train anywhere and anytime with the help of laptop technology and wireless communication, and an environment that contribute to the spread of learning everywhere, using portable devices as a medium to access knowledge". Furthermore, Jeong & Kim (2010) explain pervasive learning as "a new form of mobile phone technology with wireless sensors and communication where trainees can train continuously, overcome time and location restrictions. It is a system based on the basic features of scattered computing".

This learning method is interested in learning context, where the environment includes the presence of mobile devices, electronic tablets and smart tools that the learner can use and apply in his daily life for scientific purposes or practical purposes, such as learning at home, pitch or in the library.

The teachers of physical education and sports faculties were priority in introducing anything new in their lessons. Sport has a privacy characterized by the rest of the sports and games because the students have to deal with a new circumference which may cause fear to them and continuous concern of drowning in water. This shows the need for constant diversification of the style and method of teaching. Hence, the importance of research is in the extent to which female students benefit from pervasive learning in cognitive development and basic free swimming skills.

In this context, the aim of this study was to prepare educational units with pervasive learning model to teach the basic skills of free swimming and also to identify the effect of pervasive learning model in learning free swimming skills.

2. METHODS

2.1. Design and participants

The researcher used the experimental study design. The research community was selected by the deliberate method and it consisted of 102 students of the first stage of the Faculty of Physical Education and Sports Sciences of the University of Basra. The academic year was 2020-2021. The research sample was selected randomly and consisted of 20 students, which were divided into two groups (10 students for the control group and 10 students for the experimental group). The entire participating sample was 19 years old. The researcher assumed that the sample is homogeneous and equal, including only female students with the same age and study stage.

2.2. Materials and instruments

This study was carried out in the swimming pool of the first fitness centre of Basrah Governorate. The materials used were: HP laptop, measuring tape (50 m), adhesive tape, stopwatch, educational movies, and two electrical connectors.

The tests used in this research were: Cognitive development test, measurement of the beginning jump distance, swimming with arms and breathing, swimming with legs and breathing, and free swimming test.

The cognitive development test was an exam carried out in the second semester of the academic year 2020-2021.

Measurement of the beginning jump distance (Salary, 1999). Objective of the test: to know the capacity of the student's performance of starting in the right way. Testing tools: tape measure, chalk, registration form. Description of the test performance: the student stands at the edge of the pool with a simple flex, the body is bent forward and the arms in front up and the head between them. Test record: the correct performance by the student and the distance.

After the beginning jump, freestyle swimming skills were evaluated with the following three tests: Swimming with arms and breathing (Hamid, 2011), swimming with legs and breathing (Ragheb, 2015), free swimming test (Hamid, 2011).

2.3. Exploratory experiments

The first exploratory experience of instruments and educational units aims to know the right place to put devices in the pool, the time needed to set up the devices before the lecture and the amount of material for the students.

The second exploratory experience of the electronic portal <https://intisar.info/> aims to find the extent to which students accept and participate in communication through the electronic portal, to find out the right time for students to participate in communication through the portal, and to assess the precision and clarity of educational films.

The exploratory experience of the exams aims to learn about the appropriate tests for the sample, the configuration of the assistant staff for the tests, the time needed for each test, and the difficulties that may occur during tests.

To verify the sincerity of the tests for the basic skills of the free swimming, the researcher used the method of self-honesty. To verify stability of the tests for the basic skills of the free swimming, the researcher followed the guidelines of Abdel-Jabbar & Ahmed (1984). Table 1 presents the differences of research tests results regarding the honesty, stability and objectivity coefficients. The results showed a high coefficient for each test (Table 1).

Table 1. The coefficients of honesty, stability and objectivity of the research tests.

No	Tests	Honesty coefficient	Stability coefficient	Test objectivity
1	Measurement of the beginning jump distance	0.94	0.92	99%
2	Swimming with legs and breathing / m	0.93	0.91	100%
3	Swimming with arms and breathing / m	0.95	0.93	90%
4	Free swimming test for 15 m	0.90	0.85	100%

2.4. Educational Units

Educational units with pervasive learning model were prepared to teach the basic skills of free swimming. A total of 6 educational units were prepared (one educational unit per week during 6 weeks). The first two weeks focused on the teaching of basic principles of swimming and the other four weeks focused on the teaching of basic skills in free swimming.

The duration of each educational unit was 90 minutes: preparatory section (20 minutes), main section (65 minutes) and final section (5 minutes). The preparatory section included introduction (2 minutes), warm up (5 minutes) and physical exercises (13 minutes). The main section included time of educational activity (20 minutes) and the applied section (45 minutes). During the time of educational activity, the lecturer explains the new skill and answers all the questions of the students. During the applied section the new skill is practiced with exercises in the swimming pool. During the final section, a final game is carried out.

The teaching method with pervasive learning model included the use of the portal <https://intisar.info/>, which contains the systematic book for swimming studies adopted by the Faculty of Physical Education and Sports Sciences of the University of Basra, the lectures taught, and educational films for learning free swimming skills.

2.5. Statistical analysis

The Statistical Package for Social Sciences (SPSS) was used for data analysis. Means and standard deviations were calculated for all variables in both the control and experimental groups. Also, T-test was used to analyze the differences between control and experimental groups for all the tests.

3. RESULTS AND DISCUSSION

The results of the control and experimental groups for all research tests are presented in Table 2. As can be seen in Table 2, the T-value for each test was 3.50, 3.22, 3.13, 3.54, 4.65, and the p-value for each test was < 0.05 , indicating that there are statistical significant differences between the control and experimental group in all free swimming skills tests, in favor of the experimental group. The researcher attributed the cause of these differences to the effectiveness of the educational units implemented, which had a major role in learning free swimming skills.

Table 2. Results of the control and experimental groups for all research tests.

No	Tests	Control group		Experimental group		T	p
		M	SD	M	SD		
1	Measurement of the beginning jump	4	0.81	5.50	1.08	3.50	0.003

distance							
2	Swimming with legs and breathing / m	5.60	0.51	6.70	0.94	3.22	0.005
3	Swimming with arms and breathing / m	5.20	1.03	7	1.49	3.139	0.006
4	Free swimming test for 15 m	7.50	0.52	8.80	1.54	3.54	0.006
5	Cognitive development test	30.90	4.65	39.90	4.65	4.65	0.000

*NOTE: Freedom degree (n-2) = 18; Significant (p<0.05)

Recent technologies promote and facilitate cooperation, interaction and discussion, in order to improve the educational environment (Zaher, 2012). Pervasive learning is characterized by the involvement of students in the educational process without being tied to a place or time. Students can continue education through their interaction and continuous communication with their colleagues. The main objective of pervasive learning is to provide an educational environment that allows learning at any time and place, thus achieving a more creative educational process (Mohamed, 2009). This allows the learner to be fully immersed in the learning process, and provides the learning props and stimulants required for learners, but without requiring active attention from the learner.

The adaptive learning promise is a new educational environment that integrates e-learning features and laptop learning with wireless technology to provide content anywhere. Learning and training are provided continuously with the support of computing technology and Cypress Open Space (Tahir, Haron & Kaur, 2018).

4. CONCLUSIONS

Through this study, it has been revealed that the educational units that used the pervasive learning model had a positive impact on the development of basic skills in free swimming. Considering the results of this study, it would be recommendable to use the pervasive learning model and learning technology in physical education and sports sciences. Finally, the author recommends to carry out future studies about modern technology strategies and models in teaching.

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AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

FUNDING

This research received no external funding.

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