THE EFFECTS OF MULTIMEDIA COMPUTER ASSISTED INSTRUCTION ON LEARNING THE SWIMMING BASIC SKILLS FOR PHYSICAL EDUCATION STUDENTS

DINA METWALY[1]

Abstract

Aim. Computer technology has become an integral part of physical education, yet there have been few studies exploring the use of multimedia technology in the instruction of Physical Education. The purpose of this study was to investigate if multimedia technology affected on learning the basic skills in swimming.

Methods. 32 female students, mean age 18.1 years from faculty of physical education- Mansoura university, Divided into two groups, the experimental group comprised of (16) students. The subjects in this group participated in the swimming class with multimedia technology for six weeks; group two participated in the swimming class with traditional method as control group. Parameters assessed the high, weight, age and academic level. All subjects were free of any disorders known to affect performance, such as bone fractures, osteoporosis, diabetes and cardiovascular disease. The participants did not report use of any anti-seizure drugs, and alcohol. In addition, all participants were fully informed about the aims of the study, and gave their voluntary consent before participation. The measurement procedures were in agreement with the ethical human experimentation. All statistical analyses were calculated by the SPSS statistical package.

Results. Results indicated that a significantly different in learning the basic skills and level of knowledge of swimming between the two group for the experimental group.

Conclusion. Applying the proposed educational program using multimedia is teaching the basic skills to the faculty of physical education second year female students.

Keywords: Multimedia Computer, Arm Stroke, Leg Stroke, Breathing

Introduction

Old school confirmed their educational methods ways that the teacher is the primary source of knowledge and working actor, and the bedrock of the education process. Totally neglected the role of the learner with it the foundation of the modern view of education. Recently, information technology has been integrated into teacher education courses in many ways, such as CD-ROMs, interactive videodiscs, teleconferencing, electronic mail, and microcomputers with hypermedia/multimedia programs. Computer assisted instruction is just one of these technological applications.

Technology in the information revolution has provided many unique benefits to instructional programs. Although traditional ways of instruction are widely accepted in teaching and learning environments, some educational institutions have started to implement computer technology as an instructional approach (Bull et al., 1989, 1991; Harris & Anderson 1991; McKethan et al., 2001; Wagonner, 1992; Wilkinson et al., 1999). The educational situations must be equipped with the means to facilitate the acquisition of information, and speed of learning at the same time, and that distinguished between the teacher and the last in its ability to diversification in the use of teaching aids.

Multimedia technology as an advanced technology in audio-visual education program is applied more and more widely, with the advancement of times and the development of science and technology, such as in college physical education.

Computer Assisted Instruction (CAI) has been used for more than five decades for educational purposes. Although the use of computers is not new, CAI is still a popular and common terminology in today's educational institutions and schooling process. CAI provides an instructional interaction between the learner and the computer in a variety of contents with or without the assistance of a teacher. (Lockard, & Many, 1997).

Effectiveness study of the use of technology in the teaching of motor skills has recently attracted theresearchers' interest to a great extent. (Sorrentino, 2000). Furthermore, many researchers are experimenting on the development andapplication of Audio and visual teaching tools,

digital multimedia and virtual learning environments for the teaching of motor skills (Antoniou, et al., 2003; Vernadakis, et al., 2002; Goulimaris, et al., 2008; Kavakli et al., 2004; Smith-Autard, 2003; Popat, 2002; Parrish, 2000 ;Calvert, 2005).

It is argued that the proposed multimedia learning environments combining electronically supported image, sound, text and graphics with live performances, provide opportunities for personalized instruction,cooperation, feedback and creative interaction between the medium and the user. Their text may be in a written form)i.e. text on a computer screen) or in an audio form (i.e. narration), while their images may be static (i.e.photographs, graphs, symbols or maps) or dynamic (i.e. video, interactive depictions, animation) (Mayer and Moreno, 2003).

Although CAI has been used for more than 50 years, there is limited research on the effectiveness of CAI. In fact, several research studies have found no effects of CAI on certain subject matters. Overall, research on the effectiveness of CAI has produced inconsistent results.

Although the swimming skills are complex and difficult in education and need to clear effort to reach the learner to the point of perfection. Because swimming are known to engage in specific equilibrium exercises. Their expert levels of postural stability are responsible for some impressive movements in choreography when a dancer performs a balanced pose and holds the position for seconds. (Paula, et al.2012)

The studies on the uses of technology in the field of learning swimming skills are still few, and researcher believed that to enhance traditional teaching methods by modern technological means might contribute to raising the efficiency of the learner, and the ability to interact during the course of the lesson. It provides an instructional interaction between the learner and the computer in a variety of contents with or without the assistance of a teacher. (Lockard & Many, 1997).

Therefore, the purpose of this study was to investigate if multimedia technology affected on learning the basic skills in swimming

Methods.

Participations.

32 undergraduate female, mean age 18.1 years from faculty of Physical Education Mansoura University. Divided into equally to two groups, the experimental group comprised of (16) students. The subjects in this group participated in the swimming class with multimedia technology for six weeks; group two participated in the swimming class with traditional method (teacher instruction) as control group. Parameters assessed the high,

weight, age and academic level. In addition, all of them were beginners (not practiced swimming before). All subjects were free of any disorders known to affect performance, such as bone fractures, osteoporosis, diabetes and cardiovascular disease. The participants did not report use of any anti-seizure drugs, and alcohol. Moreover, all participants were fully informed about the aims of the study, and gave their voluntary consent before participation. The measurement procedures were in agreement with the ethical human experimentation.

Procedures.

The experimental group completed a forty-five-minute instruction session about teaching the swimming skills (arm stroke, leg stroke and breathing). For this group, a professor assisted students as a facilitator in the computer laboratory. CAI assists the learner(s) by presenting material and acting as a tutor. CAI uses computers to facilitate student learning. Students interact with computers at their own pace andthe responsibility of the teacher becomes that of a facilitator or coach. One of the major roles of CAI is to direct the students' attention to different sections in a learning sequence without the assistance of a teacher .The first CAI program, Interactive Swimming, is computer software that provides a comprehensive approach to teaching swimming. This program is a computer tutorial that includes information and quizzes on equipment, rules, strokes, etiquette, and strategies, as well as videos of top professionals explaining and demonstrating the basic steps in swimming. Interactive swimming was designed as a tutorial from the researcher.

The second CAI program, swimming Task Analysis, is a problem-solving program that promotes the development of observation skills of physical education students and teachers. It was designed to improve basic skills of swimming analysis by using concept mapping, restructuring tasks, and videos.

The Teacher Instruction group (TI) received a forty-five-minute teacher instruction session about teaching the swimming skills from main investigator as a comprehensive teaching method including demonstration, discussion, and drill.

Knowledge Test of swimming basic skills

Knowledge test (KT) is a special subject matter knowledge that provides information about the content to be learned. A Fourteen item multiple-choice test was developed by the main investigator measured Swimming basic skills content knowledge. The purpose of this test was to measure knowledge of the five phases of the Swimming basic skills: ready phase, leg phase, core phase, arm phase, and harmony phase.

Statistical analysis

All statistical analyses were calculated by the SPSS statistical package. The results are reported as means and standard deviations (SD). Differences between two groups were reported as mean difference ±95% confidence intervals (meandiff ± 95% CI).Student's t-test for independent samples was used to determine the differences in fitness parameters between the two groups. The $p<0.05$ was considered as statistically significant.

Results.

Table 2. Mean ± SD and "T" sign. Between two Groups (experimental and control) in Step of escaped, Arm stroke, breathing and Knowledge test

Variables	Experimental group		improvement Rate	Control group		improvement Rate	T sign.
	Pre	Post		Pre	Post		
Leg stroke (degree)	0.8 ±0.07	2.93±0.53*	266.25	0.6 ±0.03	1.55±0.53*	158.33	Sign.
Arm stroke (Degree)	0.9±0.02	3.00±0.60*	233.33	0.8±0.07	2.03±0.54*	153.75	Sign.
breathing(Degree)	0.5 ±0.01	3.17 ±0.41*	534	0.7 ±0.01	2.11 ±0.73*	201.43	Sign.
Knowledge test(Degree)	5.75 ±0.91	9.42 ±0.40*	63.83	5.06 ±0.98	5.68 ±0.67*	12.25	Sign.

Table 2 showed that.

Significant differences were found among the groups in Step of escaped, Arm stroke, breathing and Knowledge test

improved significantly were found among the groups in Step of escaped, Arm stroke, breathing and Knowledge test

Discussion

Based on the results of this study the t-test showed statistically significant differences between the post measurements for the experimental group in all basic swimming skills.

The researcher believed that this improvement Attributed to the Multimedia Computer Assisted Instruction (MCAI) because Quality of learning tool is not measured only with a capacity of deployment, but its ability to interact with learners and meet their various needs. The students with multimedia program could ability to analyze and correct the errors in the skill performance. One of the most common ways to do this is the qualitative analysis of movement, which has been defined as observing a movement and deciding how closely the specific features and sequence patterns of the performance adhere to accepted standards for that specific skill (Morrison & Reeve, 1988). According to Shaoyan & Yunjian (2012) Multimedia, technology improves physical teaching quality and effect a lot with various functions. Its lively language and vivid pictures can arouse students' attention and stimulate students' interests, which is opposite to stiff traditional teaching. Besides multimedia technology can expand students' thinking and improve their ability to put forward, analyze and dispose problems. College physical teaching becomes easier because multimedia technology can slow, freeze and magnify videos and pictures, which make it simple to explain high difficult and new learning actions with exact action presentation.

On the other hand, Task sequence is an essential part of skill analysis because a teacher follows these teaching patterns when she teaches skills in a sequential order. Skill analysis is an important and vital capacity for every physical education teacher to have because physical education teachers must know the critical features of a skill or movement to provide immediate feedback. Skill analysis may lead to the early detection of errors, and corrective feedback can help for skill development.

Nowadays the wide use of multimedia technology in college physical education changes traditional teaching method improves teaching effect and makes teaching procedure vivid. (Shaoyan & Yunjian 2012).

Research demonstrated that subjects who participate in special training for skill analysis performed significantly in the detection of errors compared to other participants who do not have training (Morrison & Reeve, 1988; Satern et al., 1992).

However, it should be noted that this was one of the first studies of utilizing multimedia CD-ROMs in teaching skill and task analysis in field of swimming sport. Previous research studies used different methods of qualitative skill analysis training such as, written texts (Kernodle & McKethan, 2002), interactive videodisc (Walkley & Kelly,1989), and videotape (Morrison & Reeve, 1988).

Siedentop (1988) stated that completion performed significantly better than the CAI and CG groups. Finally, the experimental and control

groups improved significantly within the group from pre to post test

In brief, Multimedia technology can transmit more data of higher quality than traditional medium in unit time and limited area. Besides it's possible to dispose and express much data including both pictures and words, which offers students convenience to conceive words data and understand teaching objects. Because of fast and efficient disposal of words, sounds, pictures and cartoons and its simulation, multimedia technology makes teaching more vivid and direct, which is not caught up by traditional medium.

Students' perception toward CAI or computers has become an important concept because computers are a very common part of today's schools in all grades. Although research in general education courses produced different results about students' attitudes toward CAI (Fratianni et al., 1990; Kraus et al., 1994). research in physical education found that students had positive attitudes toward CAI and expressed their willingness to use CAI in future activities as a learning tool (Alvarez-Pons, 1992; Wilkinson et al., 1999).

Conclusions

Multimedia technology can produce and dispose words, language, pictures and videos better with speedy expression and rich network resource, which favors knowledge renovation.

Aknowledgements

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