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Impact of Computer Game on Learning of Selected Pupils in Elementary Schools in Ekiti State, Nigeria

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Abstract: *In this paper, the impact of computer game on the learning pattern of pupils in some elementary school in Ekiti State was measured using Measures of Effectiveness (MOEs) using a simple educational game. The average scores of the students in both the pretest and posttest experiments were 12 and 16, respectively. The percentage of students that scored three-quarter mark and above in pretest was approximately 7% and 87% in posttest. Excluding the two students (13%) who obtained low scores in the posttest experiment compared to their scores in the pretest experiment, the average percentage increase in students' scores in both the pretest and posttest experiments was approximately 44%. In conclusion, this study revealed that the educational computer games will positively affect the learning patterns of students at the basic education level.*

- ***Keyword****: Computer Game, Learning, Evaluation, Elementary School*

Introduction

All systems are developed to satisfy certain functions. These functions may be easy to state but at the same time can be difficult to measure. Measures of effectiveness (MOEs) provide a quantitative basis for determining the effectiveness of the system in fulfilling the functional requirements. The level to which the system meets the required functions can be effectively determined by comparing "before" and "after" measurements of the MOEs.

It is essential to find out the impact educational games on the learning pattern of the players, especially pupils in elementary schools. In this work a game was developed for pupils in elementary schools to test their knowledge in identifying and pairing icons of same categories. For a game of this nature, the best MOE is pretest and posttest.

Pretest and Posttest Analysis

This is a measurement of the learning received during class or learning process as a result of comparing what the student knew before in a pre-test and after the process experience in a post-test. This is often used to quantify the knowledge attained in the class from a group of students with diverse learning styles and educational backgrounds. More specifically, the tests indicate how the students are learning in the course. The data will target students requiring extra help and will identify teaching and learning methods that need to be changed or developed.

Reasons for using a pre-test:

a) To measure a starting point or the amount of pre-existing knowledge on the course
b) To compare with the starting point of a post-test
c) To allow students to test out of course with a 100% correct score
d) To indicate to the student the learning level of the course topic

Reasons for using a post-test:

a) To measure the learning as a result of the course experience
b) To analyze the appropriateness of the learning objectives
c) To recognize students who need additional help
d) To target any instructional needs to improve the course

When to test?

Pre-test must be administered when a student has some relevant knowledge on the coursetopic and not without any knowledge. Post-test should be administered directly at the completion of the course and also at a later date to measure application and impact of the learning.

An option to the traditional "pre-test before the class" and "post-test after the class" is the "post-then-pre-test design. In this design, the learner is asked to first report present behaviors in a post-test and then, their perception of the same behavior before taking the course (a pre-test equivalent). Because the student is asked their perception of improved performance in the same reference of the post-test, some educators feel this is a more accurate measurement and the "response-shift bias" in self-reporting is minimized.

Compute the Gain score

The improvement (gain) from pretest to posttest can be computed for each participant by subtracting each person's pretest score from his or her posttest score:

Gain = posttest - pretest

When you compute a gain score in this manner a positive gain score indicates that the posttest score was greater than the pretest score, a negative gain score indicates that the posttest score was less than the pretest score. When a positive gain score is computed in implies that the learning process has positive impact on the learner, otherwise the learning process objective under study is defeated.

Result and Discussion

The game was deplored for fifteen students from some selected randomly from different categories of primary schools in Ekiti State. The pupils played it for about two months. The pupils were test before the game was deplored for them, forming the pretest while after two months of continuous playing of the game, forming the posttest. The results of pre- and post-tests to evaluate the effectiveness of the developed game on fifteen pupils presented and discussed with the aids of graph in this section.

Evaluation

Fifteen pupils from primary schools in Ekiti State were selected to play this game for a period of eight weeks for the purpose of testing the functionality and reliability of the game. Their scores in one of their play are represented in Table 1. This indicated that the game is playable by the targeted players. They were also pretested on selected topics in Social Studies (as covered by the game) questions before they started playing the game as means of Measure of Effectiveness (MOE). Their scores were recorded. They were also posttest after playing the game continuously for eight weeks; their scores in both pretest and posttest were presented in Table 2. Fig. 1 shows the frequency distribution of scores of Pretest scores and Post-test scores. This indicates that the game achieve the purpose for which it was developed.

The average scores of the students in both the pretest and posttest experiments were 12 and 16, respectively. The percentage of students that scored three-quarter mark and above in pretest was approximately 7% and 87% in posttest. Excluding the two students (13%) who obtained low scores in the posttest experiment compared to their scores in the pretest experiment, the average percentage increase in students' scores in both the pretest and posttest experiments was approximately 44%.

Table 1: Game Scores of selected players

Candidate No	Game score
C001	39
C002	168
C003	51
C004	33
C005	39
C006	69
C007	42
C008	132
C009	66
C010	156
C011	33
C012	135
C013	201
C014	69
C015	36

CANDIDATE NO	**PreScore**	**PostScore**	**%increase/ decrease**
C001	13	18	38.46
C002	9	17	88.89
C003	14	13	-7.14
C004	11	15	36.36
C005	13	16	23.08
C006	14	11	-21.43
C007	14	17	21.43
C008	8	15	87.50
C009	17	19	11.76
C010	12	15	25.00
C011	11	17	54.55
C012	13	16	23.08
C013	12	15	25.00
C014	10	17	70.00
C015	11	18	63.64
Mean	12.13	15.93	
% that scored above average	60	93.33	

Table 2: Pretest and Posttest of the Participating Pupils

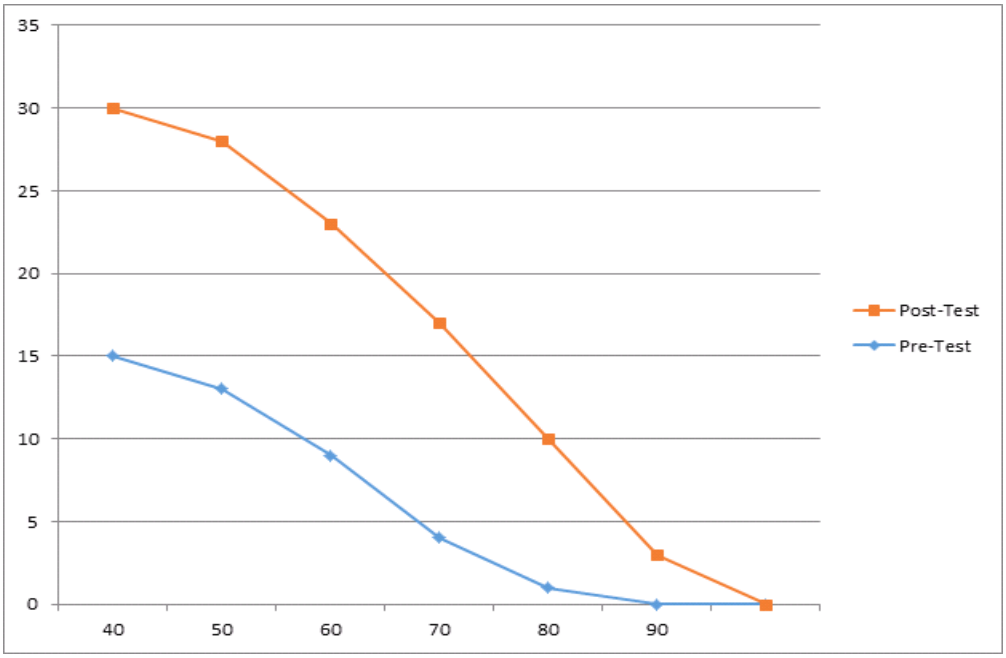

Fig. 1: The Frequency Distribution of the Pretest and Posttest Scores of the Pupils

Conclusion

It is clear that computer games affect the learning pattern of students because it is fun and a long period of time is spent in mastering the complexities of these games and accomplishing their tasks. Educational system at basic education level will be improved upon when this approach to learning is included in the curriculum.

Recommendation

There are many issues that need to be addressed before the education sector can fully realize the full potential of using computer games as a way of integrating ICT with education. Most commercially-made computer games are based on some inaccurate, badly designed and often violent themes.

Particular characteristics and challenges of a computer game design raise concerns over design issues, educational aims of the game and the learning outcomes that educational designers should deal with. These challenges can only be overcome through careful design and development of the computer game. Thorough evaluation both for systems performances and whether the system meets its learning objective is needed for the computer game to realize its full potential in supporting teaching and learning.

Further studies might explore what makes computer games interesting, fun and motivating enough to support teaching and learning. Heuristics for measuring interest, fun and motivation could also be developed to aid in the evaluation of educational computer games.

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