Access to and Utilization of Games and Simulation by Pre-Primary School Teachers in Ogun East Senatorial District of Ogun State, Nigeria

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Abstract

The study examined access to or use of games and simulation as a result of lack of adequate instructional media for individual teacher. Games and simulation are experiential exercises that transport learners to another world. The strategies allow the learners to apply their knowledge and skills in the execution of their assigned roles. Educational technology emphasizes that games and simulation may bring effective learning because they require players to make important decisions, having clear goals and adaptive to individual player. The study examined access to and utilization of games and simulation by pre-primary school teachers in Ogun East Senatorial District of Ogun State, Nigeria. Six research questions were raised to guide the study and one instrument was used: Teachers Access and Uses of Games and Simulation Scale (TAUIGSS). Using descriptive design, the study employed multistage sampling technique to administer 390 questionnaires on the respondents. The findings from the study revealed that majority of teachers do not have access to or use this technology driven strategies. The study therefore recommends amongst other thing that it is time for Nigerian education curriculum planners to integrate games and simulation into the pre-primary school curriculum and adequate instructional media should be supplied to each school for effective use. Also, teachers should be encouraged to attend workshops, seminars and conferences to update themselves on emerging technologies in education.

Keywords: Strategy; Games; Active Learning; Computer; Instructional Technologies

Introduction

Games and simulation are interactive multimedia technologies with dynamic elements that are under user control. They range from games that require simple repetitive actions such as Tetris to complex digital worlds. Unlike much of the available educational media games and simulation are highly interactive with many user-controlled features. Although, similar in many ways games differ from simulations with inclusion of goals. The shared features of games and simulation are that they transport students to another setting; ensure maximum students' involvement in learning and students are in control of the action. Gredler (2013) opined that the use of games and simulation for educational purposes may be traced to the use of war games in the 1600s which the purpose was to improve the strategic planning of armies and navies. Since the 1800s this strategies have served as a component in the military planning of major world powers. In the 1950s military simulations of crises within the context of the cold war became a staple at the Pentagon. It was explained that each simulation began with a scenario and the exercise unfolded as teams representing different governments acted and reacted to the situation. Since late 1950s the use of simulation has become effective strategy in business, medicine, aviation, sports, behavioral science, language, physical science, education and corporate training.

Designers have specified the intellectual processes, artifacts and dynamics that define games and simulations (Ajayi, 2015). Games are competitive exercises in which the objective is to win and players must apply subject matter or other relevant knowledge in an effort to advance in the exercise and win. An example is computer game Mineshaft in which students applies their

knowledge of fractions in competing with other players to retrieve a miner's axe. Findings from studies revealed that pre-school children play educational games to learn colours, numbers, names and virtually all students played video games by the time they graduate from high school. In a united state survey, it was reported that 65 percent of respondents were regular or occasional game players. Games are part of their multi-tasking environment; students play games while visiting friends, listening to music, or doing assignments. Male students were frequently seen to have online games opened alongside their assignments. Thirty percent of college students admit playing games in class and games are not just for only youths because the average age of a game player is 30 (Papastergiou, 2009).

Ronen and Eliahu (2000) revealed that in the United States, 50 percent of adults play games; one in five adults over 50 years is a video game player. Males and females play games about equally with 55 percent male and 45 percent female. Perhaps the prevalence of games is why 63 percent of parents believe games are a positive part of children's lives; nearly 60 percent of teachers in the United Kingdom are willing to use games in the classroom. Digital gaming is a $10 billion income per year industry, projected to reach $29 billion by 2019 because in 2004 only, nearly 250 million games were sold. Games are still evolving, whether or not we play games they have become part of our culture. According to Prensky (2006) the category of games available for students are adventure games, puzzle games, role-playing games, strategy games, sports games and first-person shooter games. Simulations are open-ended evolving situations with many interacting variables (Olori and Nwosu, 2011). The goal for all participants is for each to take a particular role, address the issues, treat problems that arise in the situation and experience the effects of their decisions. The situation can take different directions depending on the actions and reactions of the participants. Simulation can use any of the methods of presentation such as role play, case study and games (Olori, 2010). That is, a simulation is an evolving case study of a particular social or physical reality in which the participants take on bonafide roles with well-defined responsibilities and constraints (Adesanya, 2016). A simulated game attempts to copy various activities from real life in the form of a game for various purposes such as training, analysis or predicting e.g war games, business games and role play simulation (Ajayi, 2015).

Educational games and simulation have been found to be effective in motivating students to learn (Bond, Cohen and Sampson, 2014; Papastergiou, 2009) and games that encourage exploration may be particularly engaging to students especially girls (Kinzie and Joseph, 2008). Computer-based games and simulations are more effective in enhancing students' performance especially when some form of guidance is provided (Adesanya and Olori, 2016). According to Adesanya (2015) some games and simulation allow students to:

- explore and create materials that they could not work directly with in real life;
- help students to correct errors and misconceptions in their thinking by allowing them to test out hypotheses;
- enable students to develop familiarity with an activity before they engage in it;
- feel more confident in their skills when later working with real materials;
- correct errors and misconceptions in their thinking by allowing them to test out hypotheses;
- create pre-reading activities;
- take learning out of area of abstraction and make it participatory skills; and
- involve in a mind–on-hand-on activity.

On the other hand, Feller (2006) and Klopfer (2008) observed that the problems affecting use of games and simulation by teachers starts from availability, availability, teachers technology competence and attitude towards technology. It has been identified that computer games are can significantly influence learners interest and performance, but many teachers in Nigeria schools may neither use them nor encourage their students to use them in their classrooms as a result of inaccessibility. Unless adequate activities and materials are effectively employed there is hardly a way the learner could be in real contact with the subject matter (Ugwu, 2016).Teachers should be adequately prepared to integrate relevant instructional materials in their instructional system in

order to provide concrete, resourceful, direct, purposeful, active, thought provoking, interactive and realistic learning experiences for the students. A study by Olori (2017) revealed that the quality of instructional skills provided by teacher education programmes seem to be sufficient to make the students global citizens.

Any school curriculum will call for means of its effective implementation in order to achieve the desired objectives for which it is intended. No discussion of the curriculum is complete without a suggestion about methods, strategies or techniques of its effective implementation (Olori *et al.*, 2014). Every way a teacher does things that cause changes in the pupils' behavior means learning has taken place; and this could only be achieved through a well conceived, implemented and evaluated curriculum. The improvement in the use of games and simulation and other instructional strategies in teaching and learning has been a joint effort of the teachers, some pertinent institutions, professional organizations and other stake holders (Adesanya, 2014). These organizations and institutions often organize workshops, lectures, seminars and conferences on how to improve the use of game and simulations in pre-primary teaching and learning. In a study, it was found that students treated with computer games and simulation achieved significantly than students treated with conventional strategy in secondary chemistry (Shaffer, 2017). Majur (2018) in a study found that students exposed to games and simulation strategies perform significantly in secondary biology than students in conventional group. Adegbuyi (2018) in a study found significant effect of simulation instructional strategy on students' achievement and attitude towards basic science. With this reports on the effectiveness of the strategies there is need to further investigate access and the use of games and simulation by teachers at pre-primary level.

Adesanya (2013) opined that teaching strategy are very vital in the teaching and learning process as any strategy adopted by the teacher either promotes or hinders learning. The reason why a teacher will use effective strategy is to promote active learning so that the desired learning objectives are achieved. Generally, methods are used to provide specific knowledge, illustrate certain procedures and skills or stimulate interest along new line of thoughts. Sogbesan (2016) posited that a teacher should make use of the strength of a strategy that provides motivation in order to improve learners' performance. Benedict (2010) opined that there are varieties of teaching techniques for teachers to choose from according to situation. Examples of instructional strategies that focus on the teacher are discussion, demonstration, and question and answer while others that are learner–centred are problem solving, laboratory method, role play, games and simulation. Simulation requires participants to apply their cognitive and meta-cognitive capabilities in the execution of a particular role. Thus, an important advantage of simulation from the perspective of learning is that it provides opportunities for students to solve ill-defined problems through hands-on experience.

Educators must acknowledge that changes in learning outcomes must be supported by parallel changes in curriculum and instruction. Teachers are enjoined to make use of the new instructional technologies because the focus of educational technology is wise utilization of wide range of resources for effective and efficient communication in order to achieve pre- determined objectives. Teachers therefore need to develop technological, pedagogical, content knowledge in order to be successful in their teaching activities (Olori and Igbosanu, 2016). However, it was apparent that many teachers are caught in the midst of technological change for which they may not have been professionally prepared (Gee, 2015). Many teachers were educated in the classrooms where the role of students was to memorize information, conduct well-regulated experiences and were then tested on their ability to repeat these tasks or remember specific facts.

To function effectively in the classroom, teachers need sufficient instructional skills. However, there are diverse reports among researchers on the extent to which teachers are prepared with the skills to function effectively in the 21st century classroom (Omoniyi and Olori, 2018). Teachers in the 21st century classroom are expected to make use of appropriate instructional technologies efficiently to transfer knowledge so that students can confidently engage in the 4Cs; critical thinking, creativity, collaborative and communication skills which will qualify them as global citizens. The idea which is central to an education which defines competence as the ability of the

learners to apply acquired knowledge and skills to unfamiliar problems are not new. Theories in cognition, curriculum and instruction provide the underlying rationale for fundamental change in teaching strategies which is at the heart of the current school improvement agenda. This study is premised on three-phases of skill acquisition theory developed by Fitts and Posner (1967). It describes the achievement complex skills in learning tasks that would make learner pass through overlapping stages to make a learner changed in behavior. The theory involves demonstration, monitoring and practice which can easily make knowledge transferable thus, this is applicable to games and simulation as instructional strategies. They suggest that when learning something new the learner moves through a process, and by moving through specific phases the more the learner improves. There are three phases in this theory;

- Cognitive phase: – Identification and development of the component parts of the skill which involves formation of a mental picture of the skill
- Associative phase: – Linking the component parts into a smooth action which involves practicing the skill and using feedback to perfect the skill
- Autonomous phase: – Developing the learned skill so that it becomes automatic which involves little or no conscious thought or attention whilst performing the skill. All the students may not reach this stage therefore; emphasis is on the teacher's role in monitoring activities.

Fitts and Posner (1967) three-phase theory promotes the acquisition of meaningful learning task. It maximizes motivation and transfer of learning as well as reduces passive rote learning, which characterizes the conventional classroom teaching. This theory has been used by a number of researchers (Sonnier and Stanford, 2002; Steve, 2003; Handerson *et al.*, 2009; Barbara, 2014; Ajayi, 2015).

Statement of the Problem

Games and simulation have been proved to improve learners' motivation. However, studies reported that despite their relevance as teaching strategies for pre-primary school pupils, there are arguments over their accessibility and utilization by teachers in Nigeria schools. Therefore, this study examined access to and uses of games and simulation among pre-primary school teachers in Ogun East Senatorial District of Ogun State, Nigeria.

Research Questions

1. Do majority of the teachers have access to games and simulation?
2. Within those teachers who have access to games and simulation do majority frequently access games and simulation?
3. Within those teachers who have access to games and simulation which of the means is being used by majority to access games and simulation?
4. Within those teachers who have access to games and simulation do majority use games and simulation as teaching strategies?
5. Within those teachers who have access to games and simulation do majority frequently use games and simulation in teaching?
6. Within those teachers who have access to games and simulation do majority use games and simulation for illustration?

Significance of the Study

Findings from this research may be widely spread to stakeholders in education industry in order to take necessary decisions that will promote educational development in Nigeria. Pre-primary curriculum designers will benefit from the study because of the novelty of the instructional strategies. Government will benefit from the findings in order to provide information on the supply of relevant instructional media to schools based on learners' age and teachers will see the impact of using instructional technologies to arrest students' attention in order to improve performance. This study will not only justify the need to conduct further studies into the concept but will provide both public and private schools and other related bodies with the knowledge

required to specifically target their audience with tailor made messages. The study will provide the researchers firsthand knowledge on the concept of games and simulation and its relevance in instructional process.

Methodology

Design

This study adopted a survey research design.

Population

The population of the study consists of all pre-primary school teachers in Ogun East Senatorial District of Ogun State.

Sample and Sampling Technique

The sample consisted of 390 teachers. Multistage sampling technique was employed. Out of the 9 Local Government Areas (LGAs) in Ogun East Senatorial District of Ogun State, 6 were randomly selected. 5 public primary schools were randomly selected in each of the LGAs making 30 schools, while 13 reception and nursery teachers were purposively selected in each school because they are pre-primary teachers.

Instrumentation

The instrument is self-structured tagged "Teachers Access and Uses Games and Simulation Scale (TAUGSS)". It is divided into two sections: section A seeks teachers' bio-data while section B divided into six parts sought responses of teachers on accessibility to games and simulation, frequency of accessibility to games and simulation, means being used to access games and simulation, use of games and simulation as teaching strategies, frequency in use of games and simulation in teaching and use of games and simulation for illustration. The instrument was validated by given it to experts in educational technology for scrutiny, Cronbach Alpha applied and reliability coefficient value obtained was 0.85. All the questionnaires administered to the teachers were completed and recovered by two research assistants used being monitored by the researchers. Method of data analysis used was frequency counts and percentages.

Results

Research Question 1: Do majority of the teachers have access to games and simulation?

Table 1: Percentages of teachers' response on access to games and simulation

Categories of Reponses	Total Respondents	% of Responses
Yes	92	23.6
No	298	76.4
Total	390	100

Source: *Field Survey: September – October 2017*

As shown in table 1 above, 76.4 % (majority) do not have access to games and simulation for teaching, while only 23.6 % (minority) of the respondents have access to games and simulation for teaching. Thus, the responses clearly show that higher percentage of the teachers have no access to games and simulation.

Research Question 2: Within those teachers who have access to games and simulation do majority frequently access games and simulation?

Table 2: Percentages of teachers' response on how frequent they access games and simulation

Categories of Reponses	Total Respondents	% of Responses
(a) Once a week	50	54.4
(b) Everyday	30	32.6
(c) Twice a week	12	13.0
Total	92	100

Source: *Field Survey: September – October 2017*

In table 2, out of 92 teachers that ticked YES in research question one, 54.4% majority have access to it once a week, 32.6% minority have access to them every day, while 12 (13.0%) twice a week. This means that majority of the teachers (67.4%) do not access games and simulation frequently.

Research Question 3: Within those teachers who have access to games and simulation which of the means is being used by majority to access games and simulation?

Table 3: Percentages of teachers' response on means used by majority to access games and simulation

Categories of Reponses	Total Respondents	% of Responses
(a) Mobile phones	60	65.2
(b) Facilities in school	22	23.9
(c) Private modems	10	10.9
Total	92	100

Source: *Field Survey: September – October 2017*

In Table 3, out of the 92 teachers who ticked YES, 65.2% (majority) used their mobile phones to access games and simulation. However, 23.9% accessed games and simulation on the school's facilities and 10.9% used private modems to access games and simulation.

Research Question 4: Within those teachers who have access to games and simulation do majority use games and simulation as teaching strategies?

Table 4: Percentages of teachers' response on uses of games and simulation as teaching strategies

Question	Response	Total Respondents	% Respondents
Identify strategies being used by majority of the teachers	a) Conventional	40	43.5
	b) Individualized/ Demonstration	30	32.6
	c) Games and simulation	15	16.3
	d) Others Specify	7	7.6
Total		92	100

Source: *Field Survey: September – October 2017*

In Table 4 out of the total 92 respondents who ticked YES in research question one, 43.5% are using conventional method, 32.6% use Individualized/Demonstration method, 16.3% use games and simulation, while other strategies/methods got 7.6%. This shows that majority use conventional method while minority of the teachers uses games and simulation in teaching.

Research Question 5: Within those teachers who have access to games and simulation do majority frequently use games and simulation in teaching?

Table 5: Percentages of teachers' response on frequency in the use of games and simulation in teaching

Question	Response	Total Respondents	% Respondents
How frequency do you use games and simulation in teaching	(a) Once a week	65	70.6
	(b) Everyday	25	27.2
	(c) Twice a week	2	2.2
Total		92	100

Source: *Field Survey: September-October, 2017*

Table 5 indicates that out of 92 respondents that ticked YES in research question one 70.6% that is majority stated that they use games and simulation once in a week, only 27.2% use games and simulation every day, only while 2.2% use games and simulation twice a week .This shows that majority of the teachers do not frequently use games and simulation.

Research Question 6: Within those teachers who have access to games and simulation do majority use games and simulation for illustration?

Table 6: Percentages of teachers' response on usage of games and simulation for illustration

Question	Response	Total Respondents	% Respondents
What do you use games and stimulation for?	a) Just viewing for fun	68	73.9%
	b) To see how teachable it is	16	17.4%
	c) To give illustration whenever I have access to the usage	8	8.7%
Total		92	100%

Source: *Field Survey: September – October 2017*

Consequently, table 6 above shows that out of the total 92 teachers that ticked YES in research question one 73.9% (majority) were just viewing for fun, while 17.4% want to see how games and simulation can be used to teach, while, 8.7% use it to illustrate. The result revealed that only minority of the teachers use games and simulation for illustration.

Discussion of Findings

Findings from the research question one revealed that majority (76.4%) of the teachers do not have access to games and simulation. In research question two, out of ninety two teachers who responded that they have access to games and simulation, majority (67.4%) do not access the technologies frequently. It was also found in research question three that majority (65.2%) of the teachers use their mobile phones to access games and simulation. Also, findings in research question four reveal that minority of the teachers (16.3%) use games and simulation as teaching methods. Findings in research question five also revealed that minority of the teachers (27.2%) frequently use games and simulation in teaching, while minority of the teachers (8.7%) use games and simulation for illustration. This results show that most Nigerian teachers neither have access to nor utilize the creativity and innovations from educational technology. This finding corroborate the findings of Feller (2006) and Klopfer (2008) who found that majority of teachers do not have access to emerging technologies for teaching and learning. This finding is in support of Gee (2009) who viewed that majority teachers nowadays are caught in the midst of technological change for which they were not professionally prepared.

Conclusion

The study established that games and simulation were effective instructional strategies that can help students relax and promote the flow of communication between teachers and pupils. It is a way of facilitating the exchange of ideas which are involved in many of the active learning. The use of games during exploration can help to clarify particular aspects, reinforce previous ideas and introduce new thought. It also helps to provide some of the social and technological contexts which are important part of education. Games are typically associated with entertainment that is

intended to be educational (edutainment) thus; there is assertion that students who are deeply engaged in the activity consider it both fun and hard work. By incorporating games and simulation in schools curriculum, teachers will be able to capture attention, engage learners, explain difficult concepts, and inspire creativity. Based on the findings;

(1) Policy makers should integrate the use of games and simulation into curriculum development strategies.
(2) School administrators should supply materials to schools for effective use of these instructional strategies.
(3) Teachers should be involved in different workshops, seminars and conferences to update themselves in the use of these innovations from educational technology.
(4) Teacher training institutions in Nigeria should emphasize during training of teachers the use of games and simulation.
(5) Educational technology textbooks should be detailed in developing software packages for games and simulation.
(6) Games should be used in all subjects because of its hand-on approach which supports active learning theory.

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