FACTORS INFLUENCING TEACHERS USE OF GAMES AS STRATEGY FOR PEDAGOGY OF PRIMARY SCIENCE IN SCHOOLS: THE ROLES OF LIBRARIES

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Abstract:
This study investigates the effectiveness of games as technique for teaching and learning of primary science in schools and the role play by library services. Game, when carefully employed and executed served as an integral part of teaching method and measure of effectiveness of instruction. Research has shown that educational games can have positive impacts on student learning and motivation. The success of a game played in an instruction class depends on the type of game selected, the development of learning outcomes, and the flexibility of library in providing library unit that is equipped with multimedia equipments where learners can interact. The study was restricted to 600 male and female respondents' teachers in Ojo Local Educational District of Lagos State. Data were collected through 18 items questionnaire. The three generated hypotheses for the study were rejected, while the result of the finding revealed that significant difference exists between factors influencing teachers' choice of game, its usefulness and problems hindering the effectiveness of game(s) for teaching and learning process of primary science in schools. Conclusion and recommendation were also proffered.

Key Words: Educational games, Academic libraries, Library audio-visual unit Student learning, Jeopardy

Introduction

A critical examination of the Nigerian Primary Science Core Curriculum reveals that science is an activity-oriented subject. Greater emphasis should be placed on doing than telling. The children should be immersed in an extended series of enriched experiences that could help to give them ample opportunity of self-discovery. However as Lederman, (1997) has noted, the transaction in primary science classroom does not reflect the activity orientation, but a read-about and tell-about teacher demonstration oriented course. The changing nature of scientific knowledge calls for the need to de-emphasize science as dogma. Science should be made more relevant to every day life. James, (2008)) opined that in teaching learning process, we must remember that those at the receiving end i.e. learners must take delight in what we are teaching and in teaching science to students in particular, we must go extra mile with them involving all that is good in science. The use of game in teaching primary science according to Maduabum, (1989), is a resource or an equipment and material which the teacher can use to help the achievement of lesson objective. Game in teaching/learning process is a scientific skill such as observation, identification, classification are very important for laying a sound foundation for subsequent science.

A game can be defined as an activity that contains some or all of the following elements: rules, goals, challenges, fantasy, mystery, curiosity, competition, skill (Rendel 1992). Games that adapted and used for educational purposes aim to have players achieve a specific learning outcome as the goal of game. Over the past decade, educators have reported using games as instructional tools in a variety of disciplines. Koether (2003) described the use of a named game to teach students chemical information. Gublo (2003) used a trivia game to teach laboratory safety methods, and Grabowski and Price (2003), Deck (2002) and Dearvour (1996) developed individual variations of a science themed jeopardy to improve student retention of content in the areas of organic, general and biochemistry. Games have also been used in psychology courses to teach students abnormal psychology diagnosis,

theories of personality, and research methods (Merwin, 2003). For example at Owens library, Northwest Missouri State University, students engaged in a word find exercise or jeopardy-style game at the end of a two week library orientation instruction program in order to reinforce the material that has been taught (Ury and king, 1995). Krajewski and piroh (2002) described how freshmen at Simmons College played a game of library jeopardy during the second of two library session in order to find out about library services in a non-intimidating, fun manner. Interestingly, Rendell et al (1992) conducted a survey of published research from 1963-1991 and find 67 empirical research studies that address the effectiveness of games versus traditional instruction in the areas of social sciences, math, language arts, physics, biology and logic. Slightly more than thirty percent of these studies showed increase students learning from games in contract to conventional instruction. Subsequent to the Rendell survey, studies shown increased knowledge retention by those using an educational game compared to those receiving conventional instruction (lecture and paper based materials). Educational games are beneficial to students because they address different learning styles or preferences, provide immediate feedback, increase student motivation, and enhance a student's overall learning experience, all of which increase the chance of a positive learning outcome for the student (Rendell et al 1992). Other disciplines such as biology, nutrition and psychology have incorporated various types of games, such as wheel of fortune, bingo and cross word puzzles into post secondary classroom instruction. Science games can be grouped into competitive and non-competitive games. The competitive science games involve scoring the scoring system has a fixed number of points. One player's success automatically leads to another player's loss. Non-competitive science games involve no scoring but self developed skill and mastery of subject matter to solve related problem.

Getting Game At Your Library

The global community and the demands of the information age have re-shaped librarianship and the use of technologies to acknowledge and enhance the economic, cultural and communication revolution in today's world. There is a wide spectrum of game types from board games and card games to Web-based games and console games, and electronic games are just an extension of gaming activities already supported in libraries. Libraries that support the recreational needs of patrons through fiction or movies are simply extending these services to the popular entertainment media for a growing sector of the population. The concept of supporting gaming is one that most libraries have supported for some time. Gaming is a magnet that attracts library users of all types and, beyond its entertainment value, has proven to be a powerful tool for literacy and learning. In today's technology-driven world, where learning does not stop at the classroom, the role of libraries in supporting literacy and learning is more critical than ever before. Gaming for learning presents a tremendous opportunity for libraries to further literacy skills in children as well as adults" Numerous detailed examples of what libraries are already doing including public, school, and academic libraries, librarians can reap positive gains by proactively, creatively, and (above all) affordably integrating gaming into the services and programs already offered at your library. The case studies reveal that gaming programs often turn out to be among the most popular a library can offer. Libraries are turning more than ever to video games as a way to lure teenagers back inside their doors creating video game clubs, hosting tournaments and hoping the children will then begin to take advantage of everything else the libraries have to offer. Librarians are seeing benefits. Libraries are safe places for children and they give kids a place to gather and talk with friends. With the Provision of the library audio-visual unit, Library can link on to the game board which is a web page projected on a screen, consisting of a simple table with the top row identifying the categories and additional rows for point values (http://www.library.gsu.edu/jeopardy/music/). The questions are read aloud, and the student selects the answer. While the game board and scoring can be accomplished with more advanced technology and programming. This simple web page format allows librarians to construct the game, and easily edit and customize the game board for different classes. In addition to the simple web page format, a template for a similar online jeopardy-style game has been created by the university education technology Science (UETS) At Georgia State University. This jeopardy style game along with other games can be down loaded free of charge for educational use in the library (http://www.gsu.edu/wwwets/instructionalsupport/learningobjects/finding.html).Justas libraries have caused

controversy in the past by adding fiction to their offerings and circulating recreational videos, libraries are creating controversy today by supporting gaming through in-house gaming activities and circulation of gaming materials. At this point, there is little data about the penetration of gaming in library services. There is anecdotal data and guides to best practice, but there is little data about how many libraries are supporting gamings and in what ways.

Educational Games And Library Services

Few librarians would deny that instruction is more effective for students when it includes a high level of students' participation. Students who are actively partners in learning often show higher levels of comprehension and critical thinking (Bowe and Freeman, 2000). Instruction librarians can do this by using a combination of instructional methods such as lecture, demonstration, questions and answers and hands-on practice, in order to address as many learning styles and instructional preferences as possible. While this is certainly a good practice to follow, Oblinger (2003) suggested that the learning preferences of millennial are the trend toward teamwork, experimental activities, structure and the use of technology. Whether you are developing and constructing a game yourself or collaborating with other, particularly those with technical expertise, the following tips are useful points to consider in the creation and implementation of a game:

- Design the game around learning outcomes
- Library home page
- GIL (OPACK)
- Database and indexes

In designing a computer game developers have to establish the objectives of the game by identifying its designed impact. This influences the game play, especially the motivational elements of the game design. They also need to consider what will make the user continue to want to play the game until the objectives are fully achieved. This lies with the fact that as librarians we continuously seek new and innovative ways of teaching students library skills for students to enjoy success in their academic work. Library skills are about learning how to learn, are part of being an educated person. This is made possible by creating effective library induction programs that enhances the learning of library skills offers. Over the last few years, some libraries have been turning to gaming activities like *Dance Revolution* as a way of bringing in new demographic groups and exposing them to library services. Recently, Jenny Levine, a.k.a. The Shifted Librarian, wrote an American Library Association publication highlighting different types of video gaming activities in libraries (Levine, 2006,) and other librarians have written about their experiences in print and online (Neiburger, 2007; Schmidt, 2006; Gallaway, Schwarzwalder, Czarnecki,2007). Gaming is rapidly growing into the next new media as sales of games have outpaced box office sales and are predicted to grow beyond music sales in the near future (Alpert, 2007; Cheng, 2007)

Audio-Visual Unit Of The Library

Library should be the center of the educational institution librarian should not just find books, but also is a teacher, and should advise students on materials to further their independent study. A person could get more out of his or her personal drive to learn than in any classroom, and that the library was the key to this learning. However, provision of audiovisual unit in the library provides a source of entertainment for members of the community in the following ways:

- To provide an additional service for a group of active library users
- To attract an underserved group of users to the library
- To increase the libraries role as a community hub.
- To recognize the cultural significance of the gaming medium and to participate in it
- To introduce users to other library services and
- To create publicity for the library among other

It is hoped that when audio visual unit of libraries is fully enhanced with multimedia equipments and internet facilities, it will increase access, improve services, and establish multi channel learning environment as a resource center where learners have ample access to instructional materials to interact with and thereby complement game taught by teacher while in class to achieve its behavioral objective.

Teachrs Choice Of Game In Teaching And Learning

Teacher choice of game in teaching primary science in schools is very rare, it is a new innovation employed to enhance teaching and learning of difficult concept in science at the elementary level. These aspects of study had not been implemented into the primary school curriculum. Hence the teachers had not known it's significant. Many teachers are said to be in capable of assisting students to perceive clearly a picture of the world of work in using Game, because pupils have different learning styles, it's important to incorporate multiple teaching techniques into the classroom experience. (Nwaboku 2007). According to her, one of such technique is the use of game in the classroom to reinforce the learning objectives. Many topics in verbal reasoning, quantitative, aptitude and in computer science are well suited for coverage in such a game than in primary science. Akinola, (1998) the children should be immersed in an extended series of enriched experiences that will help to give them ample opportunity of self discovery in using Game in answering questions, filling up letters in puzzles in a science lesson, games and in toys. Teachers Choice of game depends on the pupil age, topic to be taught, level of the student, Ability of the teacher and learner, Time of lesson, size of class and, Resources at disposal among others. When game is used as a style, it does helps children to master lesson with short answers. In the most recent iteration of the operating system and a process state transition, Game helps children to appreciate different approaches to process. According to him crossword puzzles, video, dance, letter puzzles and games have been assessed for their effectiveness, providing several insight into what makes a good Game for teaching operating systems concepts in primary science and how the existing games can be improved. The nature of scientific concepts demands an innovation in imparting some learning experiences to the learners, which provide fascinating challenges. It makes the lesson actively based and helps the children to achieve the mastery of the subjects better. This is in agreement with Balogun, (1992) when he view science game as that which enable the learner to

- Develop functional knowledge and manipulative skills.
- Acquire scientific appreciation and interest.
- Develop problem-solving and scientific attitudes.
- Engaging the individuals playing the game.
- A form of socialization.
- Improving quality of life of individual playing the game.

His views therefore recommend that science games should be used in science teaching and learning in the primary schools. However the teacher should know the essential features of the various games, rules, methods of organization, values received from participation, equipment and facilities (if any) needed and ways of motivating the pupils before using them. He should also ensure that the games when used for educative purposes are not unnecessarily prolonged to avoid the aim being defeated.

Purpose Of The Study

Majority Of People Consider Games To Be Unimportant And Have No Relevance In Education. It Is Considered To Be Frivolous And A Kind Of Accidental Accompaniment Of Work. It Is Customary To Assume That Education And Work Go Together And Play Has A Relatively Minor Role In Teaching And Learning. These Feelings Are Wrong, Because In All Societies And Culture, Everyone Knows Different Plays, Even Little Children Often Involved In Personally Designed Game. Even Adults Not Only Play Games Of Their Childhood But Also Learn New Games. Thus Every One Knows About Games Because It Is Very Easy To Understand The Analogies Used, Language Of Game Has Become Part Of People's Daily Vocabulary. Games Provide Fascinating Challenges To The Learners And Add Interest, Activity And Novelty To The Lesson. In Line With These Purpose Of The Study Science Class Is Supposed To Be Full Of Activity. Using Game To Teach Science Will Increase The Student Interest And Participation In The Class.

Statement Of Problem

The problem which this study seek to address is the factor(s) influencing teachers use of game for teaching and learning of primary sciences in schools vis-à-vis

1) Factor(s) influencing the choice of game as teaching strategy by teacher

2) Level of usefulness of games for instructional purposes and delivery
3) Problems hindering the effectiveness of Games as teaching strategies for teaching/learning of primary science

Research Questions

1) **What Factor(S) Influencing The Choice Of Game As Teaching Strategy In Schools?**
2) Can The Level Of Usefulness Of Games Lead To Its Use For Instructional Purposes In Schools?
3) Is There Any Problem(S) Hindering The Effectiveness Of Games As Teaching Strategies In Schools?

Hypothesis

The following hypothesis has been formulated to be tested in the course of this study:

Factor influencing teachers' choice of game will not significantly affect its teaching strategy and methodology.

1) The usefulness of Game will not have any significant effect/impact between teaching strategy, library services, and delivery technique.
2) There is no significant effect between the problems hindering the effectiveness of Games packages and its choice of use as teaching strategy.
3) There Is No Significant Effect Between The Problems Hindering The Effectiveness Of Games Packages And Its Choice Of Use As Teaching Strategy.

Design

The Design Adopted In The Study Is A Descriptive Survey Research Designed Aimed At Teachers' Use Of Game In Teaching And Learning Of Primary Science In Lagos State.

Target Population

The Target Population Employed In This Study Consists Of All The Primary School Teachers In The Three Local Education District Of Lagos State.

Population And Sample

Purpose Random Sampling Technique Was Used By The Researcher In Selecting The Primary Schools In Each Of Led For Better Result. In All A Total Of 100 Respondents Were Sample At The Rate Of 20 In The Five Selected Schools

Research Instrument

For the purpose of the study, the researcher adopted the use of structured questionnaire to obtain relevant information about the topic of the study. Four points Likert scale rating was used. The validation and reliability of the instrument was achieved by expert examination, criticism and correction. Simple frequency count and chi-square statistical tool was used for data analysis.

RESULTS

The result of data analysis are presented in tables 1, 2 and 3 while finding and discussion of findings were proffered

TEST OF HYPOTHESIS ONE

Factors influencing teacher's choice of game will not significantly affect its teaching strategy. The focus of this hypothesis is to find out which of the factors listed below influence an individual (teacher) towards the use of games for teaching learning.

Table 1: Chi-Square Analysis of Hypothesis One

S/N	TOTAL	SA	A	SD	D	N	Df	S_1	X^2cal	X^2tab	Decision
1	Credibility of the manufacture	2	2	66	30	100					
2	Ease of use of the game	3	2	61	34	100					
3	Availability of the game packages	4	6	60	30	100					

4	It is learner friendly	3	5	72	20	100	15	0.05	24.21	25.00	Reject
5	Cost of the game packages	4	10	64	22	100					
6	Ability to meet d objectives	5	6	70	19	100					
	TOTAL	**21**	**31**	**393**	**155**	**600**					

Test Of Hypothesis Two

The usefulness of Game will not have any significant effect/impact between teaching strategy, for library services, and delivery technique.

Table 2: Chi-square Analysis

S/N	FACTORS	SA	A	SD	D	N	Df	S_1	X^2cal	X^2tab	Decision
1	It takes shorter time to study	64	60	2	4	100					
2	It increases efficiency	60	34	3	3	100					
3	It eliminates uninteresting and repetitive concept	57	30	3	1	100					
4	It affects quality of service & instructional delivery.	70	20	3	0	100	15	0.05	50.34	25.00	Reject
5	It contributes to the objective for which the study is set up.	60	30	4	7	100					
6\	It has proved effective in terms of accuracy and time	71	20	4	6	100					
					5						
	TOTAL	382	164	19	35	600					

Test Of Hypothesis 3

There Is No Significant Effect Between The Problems Hindering The Effectiveness Of Games Packages And Its Choice Of Use As Teaching Strategy.

TABLE 3: CHI-SQUARE ANALYSIS

S/N	FACTORS	SA	A	SD	D	N	Df	S_1	X^2cal	X^2tab	Decisi
1	High cost of game package	70	1	1	1	100					
2	Where it exists, there is no adequate personnel service	75	23	1	1	100					
3	My library does not support gaming	80	17	1	2	100					
4	My library does not have audio visual unit to support gaming	40	20	30	10	100	15	0.05	164.7	25.00	Reject
5	Library lack support from the school management.	70	26	1	1	100					
6	Inadequate training facilities\	70	26	1	1	100					
	TOTAL	407	140	35	18	600					

Discussion Of Findings

Based on the analysis above, it was discovered on *table one* that at 15 degree of freedom and 15% level of significance, that is X^2 calculated (29.21) was greater than X^2 table value (25.00) i.e. X^2_{cal} (29.21) > X^2_{tab} (25.00). Therefore, the null hypothesis which states that "inadequacy of factors that influence teachers' choice of game will not have any significant effect on teaching and learning of primary science in schools" is hereby rejected.

The Reasons For This Could Have Ranged From Factors Highlighted On Table One I.E. Credibility Of Manufacturer, Ease Of Use, Availability, User Friendly, Cost Of Purchase Or Production And Ability Of The Game To Meet The Objective Of The Study. This Is In Line With The View Of Hays, (2005) Which States That The Onus Of The Use Of Instructional Packages Such As Game Rests On The Government To Support In The Design Production And Training Through Adequate Funding, Human And Material Resources For The Schools.

Table 2, Based On The Analysis Of Hypotheses 2, It Was Discovered That At 15 Degree Of Freedom And 5% Of Significance, X^2cal (50.34) Was Greater Than X^2tab (25.00), Therefore The Null Hypotheses Was Rejected. This In Effect Revealed That Usefulness Of Game Has A Significant Effect On Teaching And Learning Of Primary Schools In School Reason For This Could Have Been The Level Of Its Usefulness Vis-À-Vis Time Taken To Study And Play Instructional Games, It Increases Efficiency, Elimination Of Uninteresting And Repetitive Concept, Quality Of Instructional Delivery, Contribution To The Objective Of The Study And Its Effectiveness In Term Of Accuracy, Time And Usefulness Among Others. This Is Also In Line With The View Of Nwaboku, (2007), Akinola, (1998) And Aleyideino (2000) That Education Presented In The Spirit Of Play Will Be Understood And Mastered Easily As It Provide Fascinating Challenges To The Learners And Add Interest, Activity And Novelty To The Lesson. This In Effect Helps The Children To Achieve The Mastery Of The Subject Better.

From Table 3, Base On The Rejection Of The Above Analysed Data, It Was Evident From The Finding That There Is A Significant Effect On Problem Hindering Effectiveness Of Game And The Teachers' Choice Of Game As Teaching Strategy In Schools. This Is Evident As The X^2cal (164.07) Was Greater Than X^2tab Value (25.00) The Reasons For The Rejection Of The Hypothesis Could Have Range From And Between Inadequate Personnel Of Library Services In Schools, Inadequate Training Facilities, Poor Attitude Of Staff And Learners To Training, High Cost Of Game Package, And Lack Of Supports Frown The Management Of Schools. This May Be As A Result That Game Has Not Been Implemented Into Primary School Curriculum. Hence The Teachers Had Not Know Its Significant, Many Teachers Are Said To Be Incapable Of Assisting Students To Perceive Clearly A Picture Of The World Of Work In Using Game Because Pupils Have Different Learning Style Coupled With The Above Inadequacy Levels.

Conclusion

Going By The Data Presented And Discussions Made On The Analysed Data, It Can Be Concluded That Factor Influencing The Use Of Games As Teaching Strategies To Improve Primary Science Indicated A Significant Differences Between The Variables Tested For The Study As They Were All Rejected Based On The Analysis Of Data Presented For The Study.

Recommendation

Based On The Findings Of This Study When Teachers Therefore Adopt The Use Of Game As Teaching Technique, He/She Must First Write The Behavioural Objective To Be Achieved, And Then Plan The Design Phase And Procedure Before The Teaching. Library Being The Nerve Centre Of Any Academic Institution Is Charge With Responsibilities Of Making Information And Recreational Material Available In Print, Non Print And Multimedia Resources, Library Should Be Equipped Or Build Where There Is Non, So That Learners Can Have Access And Interact At High Level With

Library Resources To Enhance Their Knowledge. With This, Teacher Will Be Able To Think Well Ahead Of The Lesson To Be Presented And Plan, Design A Simple If Possible Look For Credible Vendor Or Direct Learners To Library And Hence Implement By Combining Game As Strategy With Normal Teaching Procedure, In Effect Primary Science Learning Will Be Further Enhanced.

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