Journal of Capital Development in Behavioural Sciences Vol. 13 Issue 1 March, 2025)
Faculty of Arts & Education, Lead City University, Ibadan, Nigeria
***ISSN Online:** 2449-0679 **ISSN Print:** 2354-3981*

Effects of Edutainment on Retention in Secondary School Biology Students in Kontagora Metropolis

Olamide Temitope DARAMOLA,[1] John Othman JOSEPH[2]
Amina ISYAKU[3], Augusta Ndidi OJOKO,[4]
& Unoaku Augustina UDEOZO[5]
[1]Demonstration School, Federal University of Education, Kontagora
[2]Department of Biology, Federal University of Education, Kontagora
[3]Department of Integrated Science, Federal University of Education, Kontagora
[4]Department of Science & Technology Education, University of Jos.
Corresponding Author Email:daramolatemitope100@gmail.com
Corresponding Author Phone Number: 09062142038

Abstract

This study investigated the effects of edutainment method of learning on Secondary School Biology Students retention. A pre-test, post-test and delay-post test quasi-experimental design was adopted for the study. Of the 2,345 senior secondary school students class two (2) from 28 senior secondary schools within Kontagora metropolis, 80 students were purposively selected from three (3) schools to form the sample for the study. They were: (1 mixed day, 1 male boarding, 1 female boarding). Each school was exposed to the same curriculum content. A standardized Biology Students Retention Test (BSRT) with a reliability index of .78 obtained via split-half test was administered to all school categories. Data were analyzed using mean and t-test statistics at a significant level of 0.05. The findings revealed among others that: the edutainment group had a higher mean delay-post-test performance than other groups notwithstanding being a day school system. It was discovered that edutainment promoted retention in Biology students and that schooling system is not a barrier for edutainment learning in biology. Recommendations made included:

biology teachers should make adequate use of edutainment to promote retention of learning in students as this will cause a decline in examination malpractices in the subject, school administrators and heads should put in place facilities that supports edutainment utilization by biology teachers.

Keywords: Edutainment, Retention, Secondary-School, Biology-Students

Introduction

Edutainment is a distinctive form of entertainment that enables the participants to be educated,by getting new information from various fields of life or by influencing their postures, values and behavioural patterns. The education in these cases takes place and the participants hardly notice the process itself. There are many new means used in the process – experiential pedagogy, medial pedagogy, and IT virtual reality. As it might be obvious from the term itself, the word is a compound of two distinctive words: education and entertainment.

At first sight, the two hardly compatible terms form a new field of educational reality, in which the teacher does not perform the key role - to be the educator - but also the whole set of psychological and methodological means that are linked to the new information and communicative technologies and other heavily spread mass media (Anikina & Yakimenko, 2014). There are varied possibilities though ridden with some challenges that edutainment provides biology students learning via simple experiments, biological games, animated videos of taught topics in biology, multimedia biology educators, social media handles of biology learning sites, resource pool of simulated and interactive biology topics learning, mobile phone applications that are based on biological topics simplified.

Edutainment in Educational Institutions

The education reality of today has become so interesting from the point of view of involving learners in hands-on, hearts-on and heads-on activities in the course of teaching particularly the sciences. Institutions

are getting into the laboratories of knowledge where learners are not only allowed to touch the objects, if possible, but also make attempts in trying to understand complex physical and naturals processes (Yani, 2017). At the moment, the principles of edutainment are developed on the following fields:

1. **Information and Communication Technologies (ICT)**

The field of ICT is the most explored when it comes to edutainment. The development of modern technologies and their vast (and therefore cheap) production has brought new phenomena; such as special subject/topic based phone applications that provide an interactive interface for interaction between learners. There are also other multimedia products (subject /topic based): encyclopedias, dictionaries, charts and model with some even running offline. But now we are confronted (in the context of the high capacity networks) with development of similar internet based applications that permit learners to interact with virtual teachers who are readily available at one's beck and call.

2. **Multimedia**

This includes all educative materials that appeal to the sense of sight and sound while edutaining learners in a specific field or topic. Multimedia could be in form of recorded videos on playable devices like VCD/DVD players, SD cards and mobile phones. Content here could also be delivered via more forms, if possible (texts, spoken words, music, pictures, film) and during theprocess as many cognitive processesof the person as possible is involved.

3. **Social-media**

Social media is a relatively new field in human sociality. It is a platform that provides audio-visual-one-on-one and one-on-many interactions over the internet. The various available social media handles provide a forum for people to socialize. However, it is now a known fact that there

are loads of educative aspects embedded in so many social media handles. For example, the Google classroom pane of Google provides an avenue for a virtual classroom where quality learning activities actually take place.

Edutainment in Science Teaching

According to Anikina and Yakimenko (2014), there are a lot of distinctive teachers who are teaching science at different levels of the educational system. But now and then, it is the idea of "scientific approach" that makes the teachers to emphasize the "encyclopedia" point of view and very abstract teaching. The science teachers are in fact since the very beginning of their subject studies are set up to be afraid tousethe teaching methods and techniques that might doubt the "serious" points of view in the natural sciences research in the form of principal laws. That results in the fact that the teachers underestimate the phase of motivation, they do not unify the teaching with the practical aspects of everyday life, they might refuse to use humor in the teaching.

Often they defend the point that teaching sciences is mainly serious mental and cognitive activity and the emotional point of view should not be present when teaching. Students might thus be distracted and de-motivated and block their future studies of the natural sciences. Natural sciences subject didactics teachers are very well aware of the decrease of the popularity and negative attitude of pupils and therefore they search for new methods, forms and means that might change the tendency. One of the possibilities seems to be the usage of the didactic games and plays as described in the principles of the edutainment.

Research Assumption

The study assumes that edutainment would have an impact on students' retention in Biology. Thus, the study had the following as its objectives:

Research Objectives

To find out if there:

1. would be any difference in the mean pre-test scores of Biology students' in edutainment and conventional groups?
2. would be any difference in the mean post-test scores of Biology students' in edutainment and conventional groups?
3. is a difference in the mean delay post-test scores of the edutainment and conventional groups?
4. is a difference in the means of the delay-post-test scores of the edutainment group based on gender?

Research Questions

1. what is the difference in the mean pre-test scores of Biology students' in edutainment and conventional groups?
2. what is the difference in the mean post-test scores of Biology students' in edutainment and conventional groups?
3. What is the extent of the difference in the mean post-test scores of the edutainment and conventional groups?
4. What is the extent of the difference in the means of the delay-post-test scores of the edutainment group based on gender?

Research Hypotheses

In order to achieve the above research objectives, the following hypotheses were formulated:

Ho_1: There is no significant difference in the mean pre-test scores of Biology students' in edutainment and conventional groups.

Ho_2: There is no significant difference in the mean post-test scores of Biology students' in edutainment and conventional groups.

Ho_3: There is no significant difference in the mean delay-post-test scores of the edutainment and conventional groups.

Ho_4: There is no significant difference in the means of the delay-post-test scores of the edutainment group based on gender.

Method

Research Design and Procedure

The approach used to carry out this study is the pre-test, post-test and delay-post-test quasi-experimental design. This approach helped the researcher found out the effects of edutainment on retention in secondary school biology students in Kontagora metropolis.

Population and Sample

There are twenty-eight (28) senior secondary schools in Kontagora, but the study purposefully selected three (3) senior secondary schools to serve as the sample for the study. A total of eighty (80) Senior Secondary School Two (SS II) Biology students participated in the study from the total 2,345 SS 2 students as at the time of this research. The students were selected in groups of their schooling systems and gender (1 mixed day, 1 female boarding, 1 male boarding), with 40 students from the mixed school and 20 students each from the boarding school.

Treatment

The mixed day schoolwas taught with edutainment method to serve as the experimental group while the boarding male and female school served as the control groups, being taught conventionally without edutainment facilities. The treatment covered all the groups: The Mixed Day, Girls' Boarding, and Boys' Boarding schools as follows:

Week 1: familiarization with the students and administering of pre-test.

Week 2-4: treatment.

Week 5: revision and post-test.

Week 8: administering of delay post test

The scripts for pre-test, post-test and delay-post-test were collected and scored by the researchers. The scores of these tests formed the data for the study.

Instrument

The instrument employed for this study is Biology Students Retention Test (BSRT). This was used as the pre-test, post-test and delay-post-test. The instrument was designed in cognizance of the three (3) domains of educational objectives of knowledge (cognitive), attitude (affective), and manipulative (psychomotor). The test content covered three (3) topics from thesenior secondary school (SS II) Biology curriculum. The test was set on the three (3) topics taught during the treatment. These topics include: The cell as a living unit, the cell and its environment, and some properties and functions of the cell. The topics were taught to each of the student groups. The questions that made up the Biology Students Retention Test (BSRT) were constructed to standard as some of them were obtained from WAEC and NECO past question papers and others from standard examination questions from senior colleagues. Twenty (20) multiple choice question type of such test was employed from which students were to choose a correct answer to each question.This was administered on few students of equivalent status to obtain a data for its reliability test. The reliability test was carried out through split-halfwhich gave a reliability index of 0.78 to assure its dependability.This therefore formed the instrument for data collection in the study.

Results and Discussions

The data obtained were analysed, using descriptive (mean and standard deviation) and inferential (t-test) statistical techniques. The hypotheses were tested at 0.05 level of significance.

1. **Research Question**: What is the difference in the mean pre-test scores of Biology students' in edutainment and conventional groups?

Ho_1: There is no significant difference in the mean pre-test scores of Biology students' in edutainment and conventional groups.

Table 1: Pre-test of students' achievement in the edutainment (EG) and conventional (CG) groups.

Group	N	$\bar{x}$	SD	SEM	DF	T	Sig (2tailed)
EG(X_1)	40	5.20	2.00	0.1	78	3.30	.000
CG(X_2)	40	3.75	1.87	0.1			

Table 1 shows that the mean ($\bar{x}$) score for students in the Edutainment Group is 5.20, while the mean ($\bar{x}$) score for the students in the Conventional group is 3.75. The t-value is 3.30 with the degree of freedom of 78 and $\alpha = .000$(significance at $P < 0.05$). With the $\alpha = .000$ and being less than .050 level of significance, the null hypothesis was rejected. That is, there was a significant difference in the pre-test performance of students in edutainment and conventional groups. Table 1 therefore implies, that there was a significant difference in the performance of the students administered with pre-test in the edutainment and conventional groups. The students from the edutainment group performed better than their conventional group counterparts.

Since the students were from different schools, the differences in their academic backgrounds due toadequateorinadequate exposure to science related subjects might account for the differences in their mean pre-test scores. Another factor accounting for this might be as a result of the existing differences in their previous knowledge on the topics used for the test. It might also be that the since the edutainment group were day students,' they might have had more time for studying Biology, while the conventional group being boarding students had lesser time to study biology, since they might be pre-occupied with more of educational non-academic activities such as general work and running errands for seniors. This might also be from the fact that the edutainment group have had a

pre-knowledge on the topics before the administration of the test. This could be as a result of the biology teachers' being dedicated from the side of the edutainment group (day school), but not being dedicatedon the side of the conventional group (boarding schools) respectively.

2. **Research Question**: What is the difference in the mean post-test scores of Biology students' in edutainment and conventional groups?
   Ho_2: There is no significant difference in the mean post-test scores of Biology students' in edutainment and conventional groups.

Table 2: Post-test of students' achievement in the edutainment and conventional groups.

Category	N	$\bar{X}$	SD	SEM	DF	T	Sig (2-tailed)
EG(X_1)	40	9.83	3.77	0.20	78	0.35	.559
CG(X_2)	40	9.58	2.43	0.18			

Table 2 shows that the mean ($\bar{X}$) score for edutainment group is 9.83 while, the mean ($\bar{X}$) of the achievement of conventional group is 9.58. The t-value is 0.35 with the degree of freedom of 78 at $\alpha = .559$. With the $\alpha = .559$ being greater than .050 level of significance($P<0.05$), the null hypothesis was hereby retained. That is, there was no significant difference in the mean post-test scores of students' in the edutainment and conventional groups. Table 2 shows, that there was no significant difference in the students' achievement in Biology in the edutainment and conventional groups. Table 2 reveals that the edutainment group had a mean ($\bar{X}$) score of 9.83, while the conventional group closed up on them with a mean ($\bar{X}$) score of 9.58. It can hence be said that the difference observed in their meanscoreswas due to chance.

This finding has shown that the use of edutainment in teaching biology does not necessarily supersede the conventional methods of

teaching. As such, the success or failure of students is directly dependent on their devotedness to their academic work, the effectiveness of the teacher, the adequacy of teaching-learning aids and the conduciveness of the learning environment. This finding is in line with Daramola, (2016) who indicated in his study titled "Schooling system not a yardstick for students' success or failure in academics" that, the curriculum is the overall package upon which all schools operate. He emphasized that the effectiveness of the teacher, the method of teaching, adequate utilization of relevant instructional materials, zealousness of the students, supportiveness of the community and parents and the adequacy of government in playing its role are the determinants of success or otherwise of students.

3. **Research Question**: What is the extent of the difference in the mean delay post-test scores of the edutainment and conventional groups?

Ho_3: There is no significant difference in the mean delay-post-test scores of the edutainment and conventional groups.

Table 3: delay-post-test of students' achievement in the edutainment and conventional groups.

Group	N	$\bar{X}$	SD	SEM	df	t	Sig (2-tailed)
EG(X_1)	40	9.20	3.82	0.3	78	4.20	.045
CG(X_2)	40	5.58	1.83	0.2			

Table 3 shows that the mean ($\bar{X}$) score for edutainment group is 9.20, while the mean ($\bar{X}$) score of the achievement of conventional group is 5.58. The t-value is 4.20 with the degree of freedom of 78 and $\alpha = .045$ at level of significance < 0.05.With the α being .045 and less than .050

(P< 0.05), the null hypothesis was rejected. That is, there was a significant difference in the mean delay-post-test scores of students' in the edutainment and conventional groups. Table 3 shows that there was a significant difference in the students' achievement in Biology in the edutainment and conventional groups. Table 3 reveals that the edutainment group had a mean ($\bar{X}$) score of 9.20, while the conventional group had a mean ($\bar{X}$) score of 5.58. It can hence be said that the difference observed in their meanscores was not due to chance.

This finding has shown that the use of edutainment in teaching biology helped retention in students and it supersedes the conventional methods of teaching if retention is to be achieved. As such, the success or failure of students is not only directly dependent on their devotedness to their academic work, the effectiveness of the teacher, adequacy of teaching-learning aids and the conduciveness of the learning environment but also on the concreteness of the learning acquired. This concreteness of learning promotes retention and applicability and this has been achieved with the aid of edutainment. This finding is in line with Yani, (2017) who indicated in his study titled "the development of edutainment learning models in social science education" that, the use of edutainment is like an art painting on the mind which cannot be easily erased even with time. Going by this, the effectiveness of the teacher, adequate utilization of relevant instructional materials, zealousness of the students, supportiveness of the community and parents and the adequacy of government in playing its role could be better pivoted with an edutainment method of instruction. This makes learning fun and recall of learnt knowledge easy and fast.

4. **Research Question**: What is the extent of the difference in the means of the delay-post-test scores of the edutainment group based on gender?

Ho_4:There is no significant difference in the means of the delay-post-test scores of the edutainment group based on gender.

Table 4: t-value of difference in the means of delay-post-test scores of the edutainment group based on gender.

Gender	N	$\bar{X}$	SD	SEM	df	t	Sig (2-tailed)
Females	20	6.10	1.92	0.01	38	5.61	.045
Males	20	12.30	5.10	0.02			

Table 4 reveals that the mean ($\bar{X}$) score for male students performance is 12.30, while the mean ($\bar{X}$) score for female students is 6.10. The t-value is 5.61 with the degree of freedom of 38 and $\alpha = .045$ within the level of significance value ($p < 0.05$). With α being .045 which is less than .050(at $P < 0.05$), the null hypothesis was therefore rejected. That is, there was a significant difference in the mean scores of male and female students' academic achievement in Biology in the edutainment group.

Table 4 signifies that there was a significant difference in the achievements in Biology of male and female students in the edutainment group. The findings revealed that the male students performed better than their female counterparts. The finding is in consonance with Aksakal (2015), and Oredein & Awodun (2013) who agreed that male Day school students do better academically than their female counterparts when taught with activity method. This finding is however in contrast with Akanbi, (2015), who opined that female Day school students perform better than the male students, provided all necessary conditions are available. However, certain factors such as the students' background, the location of where the research was conducted, and other intervening extraneous variables might be attributed to the disparity in the findings.

Conclusion

This study concludes that edutainment method of teaching is a better form of activity based teaching and it is sufficient enough to support students' maximum retention of concepts learned in Biology so long as

the students, parents, teachers and governments' cooperation are adequately in place.

Recommendations

Thus, it is recommended that:

1. Curriculum planners should package Biology curriculum in such a way that it looks interesting to study in which case, theoretical concepts should be transformed into practical topics that will be easy to conceptualize and understand when taught, using edutainment method.
2. School administrators and heads should encourage students to put in more effort into their academic work by engaging in group work using different edutainment channels available to them, especially in science-disciplines like Biology.
3. Well-equipped laboratories should be put in place to aid practical learning in Biology.
4. Biological gardens, herbarium, and museums should be provided for biology teaching and learning.
5. Science teachers should explore humorous opportunities in teaching, desist from being unduly strict with students, so as to enable them develop love for their subjects, especially Biology.
6. Science teachers should create opportunities for their students to exhibit their affective and psychomotor abilities in learning where their cognition may show some weaknesses in the subject, especially Biology.

References

Aksakal, V. (2015). Theoretical view to the approach of edutainment. Procedia-social and behavioural sciences, 186(1), 1232-1239

Oredein, A.O. & Awodun, A. (2013). Impact of Teachers' Intimacy and Motivational Indices on Science Students Academic

Performance in Nigeria Senior Secondary Schools. *International Education Studies, 6*(2), 49-54.

Akanbi, J. O. (2015). Students' Correlates as Functions of Achievement in the School Certificate Physics. *Kontagora Journal of Science and Technology* (KONJOST), 4(1), 8.

Daramola, O. T. (2016). *The Effects of Activity Methods on Students' Academic Achievement in Biology in Boarding and Day Schools.* An Unpublished B.Sc.(Ed)Research Project. Department of Biology, School of Sciences, Federal College of Education, Kontagora in affiliation with A.B.U. Zaria, Kaduna State. pp 16.

Anikina, O. V. & Yakimenko, A. (2014). *Edutainment as a modern technology of education. International conference on research paradigms transformation in social sciences, 166(1), 475-479.*

Yani, K. (2017). *The development of edutainment learning model in social science education/ips research and development study on ips education at elementary level in Bandung and Cimahi*. Bandung-Cimahi: Band-Cima publishers, pp 34-37.