

EFFECTS OF COMPUTER-BASED ANIMATION ON UNDERGRADUATE PERFORMANCE IN FIRST AIDS CONCEPT OF HEALTH SCIENCE

¹Ibrahim Ologele, ²Odewumi, Michael Olubunmi, ³Olubunmi Rosalie Ininolu, ⁴Isiaka Garba and ⁵Oyeyinka Abramam Jide

¹Department of Health Promotion and Environmental Health Education,
Faculty of Education, University of Ilorin, Ilorin, Nigeria
Ologele2010@gmail.com,

²Department of Educational Technology,
Faculty of Education, University of Ilorin, Ilorin, Nigeria

³Department of Medical Rehabilitation,
Faculty of Basic Medical Sciences, College of Health Sciences,
Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria,

⁴Department of Physical and Health Education,
Federal College of Education Special Oyo, Oyo State

⁵Department of Physical and Health Education,
Federal College of Education Special Oyo, Oyo State

Abstract

Animation is a form of technology for teaching and learning instruction. However, despite its relevance, its usefulness to learning, its integration to learning of health science by undergraduate have not been established. Therefore, this study examined the effectiveness of computer based animation for learning of First Aid. The study also investigated the influence of gender on the performance of the students. The quasi-experimental of pre and posttest were used. The study used 200 level undergraduate of department of Health Sciences from university of Ilorin. Students were divided into two groups of experimental and conventional based on their gender. The instruments were Computer-based Animation Package, First aid Test and guides. First aid test was trial tested with reliability of 0.73 with test-retest method using Pearson product moment correlation. Hypotheses were tested with ANCOVA and t-test analysis at 0.05 level of significance. Finding revealed that students exposed to CAP performed significantly and gender of students did not influence students performance. It was recommended that lecturers of health sciences should use computer-based animation in their teaching.

Key words: Computer-based animation, Undergraduate performance in health science, Computer performance.

Introduction

The 21st century ushered in the development of technology in diverse ways. This development brings about innovations in education and learning environments. Moreover, the use of technology has effectively changed unproductive conventional pedagogical to productive and functional ones through the technology of instruction. Interactive learning otherwise refers to as the computer-based learning is product of instructional technology. This learning structure is referred to as a learning through compute-based system which involves texts, animation, graphics, audio, video, among others (Roger, Sharp & Preece, 2011). It plays an important role in helping learners greatly in learning processes (Nusir, Alsmadi, Al-kabi & Shardqah, 2011).

In another word, computer is a device which is developed and been employed to handles instructions in education. It possesses the aptitude to stimulate learners' interest in diverse ways. The study of Idowu and Odewumi (2017) explained that computer technology has helped or

transformed educational enterprise based on its implications to learning. It has change learning from inactive to proactive and now makes the instruction meaningful and without much stress on both learners and instructors. In addition, Shute and Rahimi (2017) expressed that the developments of computer technology has contributed in a large way to the development of technology of instructional delivery, which exposed learners to different learning methods. In the similar vein, the advancement in computer technology has brings about an increase in editing; mixing and utilising of varieties of colours for visual in both still and motion technologies like animation, graphics, sound and text.

Literature Review

Teaching include teachers engaging in diverse instructional materials for delivery of instructional content to the students. These instructional materials are models, charts radio, television, maps, filmstrip, projectors and packages (Onasanya & Omosewo, 2011). These facilities rendered teaching meaningful in classroom.

Many studies have explained technology in instruction as packages use for delivery of educational content in diverse ways. For example, Madhavan (2010) mentioned that instructional packages are used to compliment information content. In addition, it makes teacher to talk less and present meaningful content to the students. In another words, it enhances perfection of content delivery to the target audience (Akerelle, & Afolabi, 2012). The study of Gambari, Falode, and Yusuf (2014) mentioned that instructional packages are utilised by the instructor and the learners for teaching in the classroom. Likewise, Amosa, Ogunlade and Atobatele (2015) explained that instructional package assists students to learn.

In this regards, according to Baglama, Yucesoy and Yikmis (2018) who explained that animations as learning tool makes abstract concepts to be learnt easily and permanent retention of more facts by the learners. In the same vein, animation is a procedural process that produces motion effect and illusion in sequence; this is done by creating still images in either analogue or digital in a physical environment. Similarly, Gambari, Falode and Yusuf (2014) explained that animation as a procedure that involves visual information and grouped animation into versions of illustration type of static and motion animated. The static version are graphical without the movement of visual to exhibits while the motion animated type show forth the process of visual progression in the operational way.

Owolabi and Oginni (2014) explained that animation as a teaching device shared the attributes of both audio and visual presentations and employed for instructions. It is also a composition of several moving pictures displayed in progression within a short period of time and the productions of visual that generates apparent movement of visual for instruction (Hoffler & Leuther, 2007). Animation is an alternative teaching method to visualize knowledge of reshaping graphical words in a special format (Pekdag 2019). Computer animation is a computer-based computation utilised to create visual output that makes the perception of noticeable movement (Parent, 2009). Dwyer and Dwyer (2003) delineated animations as images in movement, while, Johnson, Ozogul, and Reisslein (2015) advocated animations for future teaching.

Students' have established animation as effective tool in teaching and learning of different disciplines. For example, Abdo and Al-Awabdeh (2017) determined animated videos on English grammar, the findings showed that the educational pedagogy is in line with language theory and that it promotes young learners with opportunities to handles animated videos easily and it enhanced their learning. Also, Islam, Ahmed, Islam, and Shamsuddin, (2014) examined learners education via animation, the study established that the approach greatly influenced students' knowledge and skills acquisition. Similarity, Musa, Ziatdinov and Griffiths (2013) observed that computer animation instructions influenced teaching and learning. In addition, Aksoy (2013) studied the effectiveness of

computer animation on Solar System in the Science and Technology Course, the study concluded gains in students' academic achievement. In the same vein, Kittidachanupap, Singthongchit, Naenudorn and Khopolklang (2012) determined animation on English vocabulary among children and revealed that it helped children more than their counterpart not exposed to animation.

Furthermore, Falvo (2008) examined animations and simulations on the teaching and learning of Molecular Chemistry, and established the benefit of animation to comprehend the concept. Likewise, Rosen (2009) examined the effects of animation-based on on-line instruction in learning science and technology, the findings revealed that the perception of students was positive. Also, Akpoghol, Ezeudu, Adzape and Otor (2016) determined the effects of lecture method and computer animation on Senior Secondary School Students performances in Electrochemistry and concluded that animation is more effective than lecture method, while it was not significant on gender basis. Other studies that showed effectiveness of computer-based animation were Akta, Bulut and Yuksel (2011) in mathematics and statistics, Westhoff, Bergman and Carroll (2010) in Biology and Shepherd (2012) in social skills among others. Nevertheless the present study sought to examine whether the positive influence recorded in the above studies through the use of animation pedagogical can also influenced First aids concept in Health sciences among the undergraduate of University of Ilorin, Kwara State, Nigeria.

Animation as an emerging and effective technological tool in instructional delivery has not enjoyed much studies in its use on content delivery. First aids concept of Health Science in University of Ilorin among the undergraduate sought to determine the effects of animation on undergraduate achievement in First aids concept and examine moderating effect of gender on the dependent measure.

Hypotheses

These hypotheses were formulated to guide the study.

- H₁. There is no significant difference in the achievement of students when they are taught first aid with computer based colour animation and those exposed to conventional method.
- H₂. There is no significant difference in the achievement of both male and female students exposed to first aid teaching through computer based colour animation.

Methodology

Quasi-experimental design of the pre and post-test control group was used for the study. There was two intact classes of both experimental group and control group from the existing part Two undergraduates of the Department of Health Sciences, University of Ilorin. The two groups were first pre-tested with the test materials. Then, the undergraduates who falls under the experimental group was taught with the computer based animation which is the treatment instrument while the other group were taught using the conventional teaching method, where they were not exposed to computer-based animation. Thereafter, the two groups were exposed to the same posttest after the treatment.

Sample and Sampling techniques

All part two undergraduate student of University of Ilorin, Nigeria, constituted the population. Sixty-five students' (33 Males and 32 females) were randomly assigned into conventional and experimental groups. Intact classes of 200 level undergraduate of both male and female were used for the study.

Research Instrument

The research instruments were Computer-based Animation Package, First aid concept test and instructional guides.

Animation Package: It consists of first aid mode on the prescribed content on first aids divided into module, each module were written in English language and when displayed it shows the hand written wordings followed by the wordings of what they were written. Thus, the package displayed both the content in audio visual.

First Aid Concept test: The investigation self-design and constructed 25 items multiple choice with four responses. The test is used to measure the performance of learners in the pre-test and post-test and then provided answers to the objective test items. On the scoring, one mark was awarded for the correct answer, while zero for incorrect answer.

Validation of the instruments

The instruments undergone face and content validity from the researcher's colleagues, five lecturers of health sciences, two educational technology experts, one test measurement and evaluation experts. Their recommendations and constructive comments was utilised to modify the instruments. The reliability of instrument especially First aid achievement test was measured with test-retest procedure. The test instrument were administered to 20 undergraduate part two students of another public. After an interval of three weeks the test was administered again on the same sample. After this the two sets of score were correlated. The reliability was calculated using Pearson product moment correlation and the value of 0.76 was obtained.

Experimental procedure

The researchers along with an experienced computer operator guide the students during the teaching. The computer based animation was written on a compact disk and given to every undergraduate in the experimental group. The instructions provided, guided the use of the package. The package was self-explanatory. The treatments lasted six week, the first week was for exposing the students to tips on computer operation while the last week was for evaluation of posttest on First aid achievement test.

Data Analysis Technique

In testing the hypothesis stated for the study Analysis of Covariance was used to test hypothesis one and t-test for hypothesis two.

Testing of Hypotheses

H₀₁. There is no significant difference in the achievement of students when they are taught first aid with computer based colour animation and those exposed to conventional method.

To test the hypothesis, the pre-test scores of the student were used as covariates, this was reflected in table 1

Table 1:

ANCOVA Table of students taught via Computer based animation and those students taught with conventional method.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	7888.851 ^a	7	1126.979	54.486	.000
Intercept	429.707	1	429.707	20.775	.000
VAR00003	24.618	1	24.618	1.190	.283
VAR00002	622.374	6	103.729	5.015	.001
Error	723.940	35	20.684		
Total	31222.000	43			
Corrected Total	8612.791	42			

The result in Table 1 showed the post-test mean score of the experimental and control groups. The calculated F value of 5.015 is significant because the significant value of .001 is less than the 0.05 alpha level. This implies that hypothesis one is not rejected.

H₂. There is no significant difference in the achievement of both male and female pupils exposed to first aid teaching through computer based colour animation.

In testing this hypothesis the achievement of both female and male students taught with Computer-based animation were tested using the t-test to compare the mean of the male and the female students as shown in Table 2.

Table 2: t-test summary of both female and male students exposed to computer based animation.

Variable	N	Mean	Std. Deviation	Df	t	Sig.(2-tailed)
Male	33	31.0	5.37	63	3.370	.001
Female	32	35.0	3.34			

The Table 2 revealed that the calculated t-value of 3.370 is significant because the significant value of .001 is less than the 0.05 alpha level. This implies that the hypothesis is not rejected.

Results and Discussion

The two hypotheses specified significant difference therefore, the two hypotheses were not rejected. In essence, the finding was in line with the findings of Macedonia (2005) whose finding reveals that using animation for instructions delivery elicits positive changes from students in term of academic gains. It also corroborate that of Karakas (2011) whose findings shows that *animated cartoons promotes easy learning of vocabulary among students*. Furthermore, the findings was in agreement with the study of Aktas, Bulut and Yuksel (2011) and Karacop and Doymus (2013) whose studies confirmed the computer animation as a better tool that helped students to perform well compared with their counterpart taught with conventional pedagogy. Also, the finding agreed with the findings of Holmgaard, Pedersen and Abbott (2013) whose findings stressed that computer and animation technologies as effective teaching and learning of special students. The present finding supported Abdo and Al-Awabdeh (2017) whose finding concludes that there was a significant difference when animation is used to teach and also the findings of Akaydin and Kaya (2018) established that animation brought significant increase to academic achievements of students. Therefore, it has been established that using animation in education brings about a significant increase in academic achievements of learners in a positive dimension.

Conclusion and Recommendations

The computer-based animation enhanced students academic performance in First aids concept of Health science of University of Ilorin, Nigeria with emphasis on gender. The study therefore, recommended the adoption of computer-based animation by all lecturers in Nigerian universities.

Reference

- Abdo, I. B., & Al-Awabdeh, A.-H. (2017). *Animated Vid-eos Prove to be Beneficial in Teaching English Grammar as EFL: A Neurological Study of How Students Learn and Retain English Grammar*. Creative Education, 8, 1415-1423
- Akaydin, B. B. & Kaya, S. (2018). Sosyal bilgiler dersinde animasyon iceren ve icermeyen 5E modeli'nin ogrencilerin basari ve tutumuna etkisi. Kastamonu Egitim Dergisi, 26(1), 171-179.

- Akerele, J. A. & Afolabi, F. A. (2012). *Effect of video on the teaching of library studies among undergraduates in Adeyemi College of Education, Ondo. Library Philosophy and Practice*. <http://unllib.unl.edu/LPP/>.
- Akpoghol, T.V., Ezeudu, F.O., Adzape, J.N. & Otor, E.E (2016). Effects of Lecture Method Supplemented with Music and Computer Animation on Senior Secondary School Students' Academic Achievement in Electrochemistry. *Journal of Education and Practice*. 7(4), 75-86
- Aksoy, G. (2013). Effect of Computer Animation Technique on Students' Comprehension of the "Solar System and Beyond" Unit in the Science and Technology Course *Mevlana International Journal of Education (MIJE)* 3(1), 40-46.
- Aktas, M., Bulut, M & Yuksel T. (2011). The effect of using computer animations and activities about teaching patterns in primary mathematics. *The Turkish Online Journal of Educational Technology*, 10(3), 273-277.
- Amosa, A. A., Ogunlade, O. O. Atobatele, A. S. (2015). Effect of Field Trip On Students' Academic Performance in Basic Technology in Ilorin Metropolis, Nigeria. *Malaysian Online Journal of Educational Technology*, 3(2), 1-6.
- Baglama, B., Yucesoy, Y., & Yikmis, A. (2018). *Using Animation as a Means of Enhancing Learning of Individuals with Special Needs*. TEM Journal. 7(3), 670-677.
- Dwyer, F. & Dwyer, C. (2003). *Effect of animation in facilitating knowledge acquisition*. Paper Presented at the Meeting of Pennsylvania Educational Research Association, Hershey, PA
- Falvo, D. (2008). Animations and simulations for teaching and learning molecular chemistry. *International Journal of Technology in Teaching and Learning*, 4(1), 68-77.
- Gambari, A. I., Falode, C. O. & Yusuf, M. O. (2014). Development and Validation of Computer Instructional Package on Physics for Secondary Schools in Nigeria. *Educational Research International*, 3(1), 112-130
- Hoffler TN, Leuther D. (2007). *Instructional animation versus static pictures*. Ameta-Analysis Learning and Instruction. 7:722-738.
- Holmgaard, A., Pedersen, H. & Abbott, C. (2013). Animation: Children, autism and new possibilities for learning. *Journal of Assistive Technologies*, 7(1), 57- 62.
- Idowu, L. & Odewumi, M. O. (2017). Effect of computer assisted instructional package on the performance of senior secondary school students visual art in Shagamu, Nigeria. *European Journal of Education*. 3(4), 627-681.
- Islam, M. B., Ahmed, A., Islam, M. K. & Shamsuddin, A. K. (2014). Child Education Through Animation: An Experimental Study. *International Journal of Computer Graphics & Animation (IJCGA)* 4(4), 43-52
- Johnson, A. M., Ozogul, G. & Reisslein, M. (2015). Supporting multimedia learning with visual signalling and animated pedagogical agent: Moderating effects of prior knowledge. *Journal of Computer Assisted Learning*, 31(2), 97-115
- Karacop, A. & Doymus, K. (2013). Effects of jigsaw cooperative learning and animation techniques on students' understanding of chemical bonding and their conceptions of the particulate nature of matter. *Journal of Science Education and Technology*, 22(2), 186-203.
- Karakas, A. (2010). *The Impact of watching subtitled animated cartoons on Incidental vocabulary learning of ELT students*, Hacettepe University, Ankara, Turkey, 12(4).
- Kittidachanupap, N., Singthongchai, J., Naenudorn, E & Khopolklang, N. (2012) Development of animation media for learning English vocabulary for children", IEEE International Conference on Computer Science and Automation Engineering, May 25-27, Zhangjiajie, China

- Macedonia, M. (2005). Games and Foreign Language Teaching. Support for Learning, 20,
- Madhavan, T. (2010). Teaching Learning Materials. Retrieved from *Blog atwordpress.com*
- Musa, S., Ziatdinov, R. & Griffiths, C. (2013). *Introduction to computer animation and possible educational applications*. In M. Gallová, J. Gunčaga, Z. Chanasová, M. Chovancová (Eds.), *New Challenges in Education. Retrospection of history of education the future in the interdisciplinary dialogue among didactics of various school subjects* (ed., pp. 177-205). Ružomberok, Slovakia:
- Nusir, S., Alsmadi, I., Al- kabi, M. & Shardqah, F, (2011) "Designing an Interactive Multimedia Learning System for the Children of Primary Schools in Jordan", IEEE Global Engineering Education Conference (EDUCON), April 4-6, Amman, Jordan.
- Owolabi Olabode Thomas¹ and Oginni Omoniyi Israel¹ (2014). Effectiveness of Animation a Multimedia Teaching on Students' Performance in Science Subjects. *British Journal Education, Society & Behavioural Science* 4(2),201-210.
- Onasanya, S.A., & Omosewo, E.O. (2011). Effect of improvised and standard instructional materials on secondary school students' academic performance in Physics in Ilorin, Niger *Singapore Journal of Scientific Research*, 1(1),68-76.
- Parent, R. (2009). *Computer Animation Complete*. Burlington: s.n., pp. 4; 27-35.
- Pekdag, B. (2010). Kimya öğreniminde alternatif yollar: Animasyon, simülasyon, video multimedya ile öğrenme. *Türk Fen Eğitimi Dergisi*, 7(2), 79-110
- Roger, R., Sharp, H & Preece, J. (2011) "Interaction Design: Beyond Human-Computer interaction" John Wiley & Sons, Inc.
- Rosen, Y. (2009). The effects of an animation-based on-line learning environment on transfer knowledge and on motivation for science and technology learning. *Journal of Education Computing Research*, 40(4),451-467.
- Shepherd, A. (2012). The case of Drew: An animated social narrative intervention to improve the social skills of a student with a mild intellectual disability (MID). *Journal of Student Engagement: Education Matters*, 2(1), 65-77
- Shute, V. J. & Rahimi, S. (2017). Review of computer-based assessment for learning in elementary and secondary education. *Journal of Computer Assisted Learning*, 33(1), 1-19.
- Westhoff, B. W., Bergman, D. & Carroll, J. (2010). *The effects of computer animations on high school students' performance and engagement in biology*. Proceedings of the 6th Annual GRASP Symposium, Wichita State University, 2010.