
Effect of Video Instruction on Students' Achievement in Practical Agricultural Science

By

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ABSTRACT

This study determined the effect of video instruction on students' achievement in practical agricultural science in senior secondary schools. To achieve this, three research questions and three research hypotheses were formulated. The study adopted quasi experimental research design. The area of the study was Gombe State; the population comprises all 8,752 senior secondary schools students (SSII) in Gombe state. A systematic sampling technique was employed in selecting two secondary schools from the area. The 74 students in the two intact classes were used as a sample; the treatment (instructional video) was produced by the researcher that contained practical topics on practical Agricultural Science SSII scheme of work. The instrument was Practical Agricultural Science Test (PAST); the PAST questions were adopted from previous NECO and WAEC Practical Examination questions. The instrument was pilot tested; the reliability coefficient (r) of 0.96 was obtained; using (PPMC). The experimental group was taught using instructional video for three weeks, while the control group was taught using conventional way for same period of time. Both the groups were pre tested and post tested. The data collected was analyzed using mean and standard deviation while the null hypotheses were tested using t -test. The students in the experimental group performed better than those in control group. Instructional video had effect on students' achievement ($P < 0.05$). In conclusion, the use of instructional video is as effective as the real specimen. It was recommended that. Teachers of Agricultural Science in secondary schools should teach practical agricultural science using instructional video in absences of real specimen.

Key words: - video instruction, students' achievement, practical agricultural science, secondary schools

INTRODUCTION

Agricultural science is not only a kind of education that is important to the individuals who acquired it, but also useful to everyone in the society and the nation in general. According to Adedoyin and Torimiro (2007), there is no nation that can improve its food production, raw materials, goods and services without applying the knowledge of agriculture. They further states that, objectives of the agricultural science curriculum are to arouse and sustain pupil's interest in the art of practical, to enable them acquire elementary knowledge and manipulative skills in

agriculture. It is also to prepare them for further studies and career opportunities in agriculture. Agriculture core curriculum is practically oriented, right from the first year of schooling to the final year (Haruna, Okeh, & Ajayi, 2010). They further stated that, agricultural science is one of the vocational subjects in secondary schools, and it should be able to: Stimulate creativity, promote cultural heritage and make students productive and self employed individuals.

Teaching and learning of agricultural science is a function of utilization of materials/facilities or

teaching aids, more especially the practical aspect. Ahmed (2008) pointed that, teaching agricultural science involves three major domains of educational objectives namely; cognitive, affective and psychomotor. He also stated that, it has been observed that, teachers of agricultural science mostly emphasized on cognitive domain at the expense of other two domains. The development of psychomotor domain involves practical activity in agricultural science for meaningful learning.

He further stated that, the poor performance of students' in external examinations in agricultural science has been attributed to inability to tackle the practical aspects in the examinations. Video is a potential window that can expose the mind and heart of many Nigerian students to modern practical or psychomotor learning of concepts, far more than the use of charts or not real specimen in classrooms (Babajide & Bolaji 2005). They observed that, teaching methods that encourage students centered activities for developing reasoning in teaching agricultural science is depending on the nature of materials to be used. Effective teaching of practical agricultural science is centered on certain factors such as: what, when and how to teach the content.

Children and youth that are at the ages of secondary schools are so interested in watching home video, therefore, their interest in watching home video films can be change in to the formal school system in teaching and learning practical agricultural science concepts. Ubogu (2006) reported that video is now permeating the educational system as a tool for effective teaching and learning. With video, the communication of information can be done in a more effective manner and it can be an effective instruction media for delivering information. Adekunmisi and Ojo (2009) opined that, an intelligent use of audio-visual aids will save time and stimulate students' interest; it also increases the retention of knowledge learned and stimulates understanding and attitude. Ogunbote and Adesoye (2006) expressed that, video technology adds new dimension to learning experiences, because concepts were easier to present and comprehend, when the words are complemented with

images. Stating further that, it has been established that learners retain more when a variety of senses are engaged in impacting knowledge; and the intensity of the experience aids retention and recall by engaging social, emotional and intellectual senses. Omagberri & Akinola (2004) supporting this view, expressed that, access to video information could stimulate changes and creates conducive learning environment and make learning more meaningful and responsive to the localized and specific needs of learners.

According to Agwubike and Ikeoji (2006), it may be desirable to own all the facilities/specimens recommended by the curriculum, or the facilities required to meet the need of the content, but it has been found that most of the specimens/facilities are not available.

Statement of the Problem

The curriculum of agricultural science emphasis that, theory should be integrated with practical, but this cannot be obtained in most of our senior secondary schools (Andrews, Guitar, & Howie, 2010). This leads to student's failure in agricultural science examination due to poor performance in practical section of the examination (NECO 2012). Some teachers may not teach some concepts in practical agricultural science under normal classroom situation, until few days to examinations (S.S.C.E). They use the examination bodies' specimens to teach the students' in one or two days to the commencement date of the examination (Modabelu & Duvie, 2012). This is because most of the specimens are not available in the schools. Some of the specimens are dangerous and toxic to both the teachers and the students, while others are seasonal, some may be unaffordable all these factors may lead to or increase the level of unavailability of the instructional materials for teaching practical agricultural science. Hence, there is need to find out the effectiveness of instructional video in teaching practical agricultural science in absence of the real specimen. More so, video is easier to operate and affordable when compared with other audio visuals aids such as computer and projector.

Purpose and Research Questions

The purpose of the study was to determine the effect of video instruction on student's achievement in practical agricultural science in senior secondary schools.

Three research questions were formulated in order to guide the study

- i. What is the difference in the student's achievement at pre-test between those taught using instructional video and those taught using conventional way in practical agricultural science?
- ii. What is the difference in the student's achievement at post-test between those taught using instruction video and those taught using conventional way in practical agricultural science?
- iii. What is the difference in the student's achievement between the pre-test and post-test of those taught using instruction video?

Research Hypotheses

Three null hypotheses were formulated in order to guide the study.

Ho₁: There is no significant difference in the student's achievement at pre-test between those taught using instructional video and those taught using conventional way in practical agricultural science.

Ho₂: There is no significant difference in the student's achievement at post-test between those taught using instruction video and those taught using conventional way in practical agricultural science.

Ho₃: There is no significant difference in the student's achievement between the pre-test and post-test of those taught using instruction video.

METHODOLOGY

Quasi experimental design, non-equivalent control group (intact class) was used; it allowed the researcher to use the existing classroom the way they are in the school, because most of the school authorities may not accept the disruption of their

normal classroom setting because of a research (Sambo 2005).

The design is diagrammatically shown below.

	G1	Y11	X
Y12			
	G2		Y21
Y22			

The area of this study was Gombe State located in the North-East Geo-political zone of Nigeria, The targeted population comprised all senior secondary schools that offer agricultural science subject with about 8,752 senior secondary schools students (SSII) in Gombe state. A systematic sampling technique was employed in selecting two secondary schools that offer agricultural science as a subject. The sample schools were assigned into experimental and control group through random sampling technique, 74 students in the two intact classes were used as the sample. The treatment is the process of teaching using instructional video which was produced by the researcher; the instructional video clip contains the audio-visual practical specimen for agricultural science on some topics of practical agricultural science based on the scheme of work for SSII. The instrument was a set of questions (test) titled Practical agricultural science test (PAST) The PAST questions were adopted from previous NECO and WAEC practical agricultural science examinations questions that are related to the topics taught. The reliability (r) coefficient of 0.96 was obtained, using {PPMCC} at pilot testing. The test was administered to all the groups at the pre-test, the same instrument but with modification in the arrangement of the questions to avoid test wiseness was administered at post test. The data were analyzed using mean and standard deviation to answer the research questions. Null hypotheses were tested using t-test all at 0.05 level of significance.

RESULTS AND DISCUSSION

Research questions one: What is the difference in the achievement of the students at pre-test in

practical agricultural science before the treatment between the experimental and control group?

The results required to answer this research question are presented in Table 1. The result shows that, the performance of students during the pre-test in (PAST) of the control group was 26.26 mean with standard deviation of 6.67, while the performance of experimental group was 26.31 mean with standard deviation of 5.70. The experimental group performed almost similar with the control group at the pre-test. The relatively same performance obtained from both groups may be attributed to the similar characteristics

they have such as age limit, day school and co-education. The finding is in agreement with finding of Mohsen (2013) who conducted a study and reported that, there was no difference in the mean performance of the subjects at pre-test between the experimental and control group; the subject performed nearly the same before the treatment. But, the finding disagreement with the study of Hee (2011), who conducted a research on the effect of problem-based solving method using video, where the experimental group here scored higher mean than the control group at the pre-test.

Table 1. Mean and standard deviation of the Pre-test score for experimental and control group.

Groups	N	\bar{X}	SD
Experimental	33	26.31	5.70
Control	34	26.26	6.67

Research questions two: What is the difference in achievement between the students taught practical agricultural science using video instruction and those taught using conventional way after the treatment?

The results required to answer this research question were presented in Table 2. The mean score of student's achievement in the experimental group was 44.97 with standard deviation 3.89, while mean of the control group was 28.30, with standard deviation of 5.55. Experimental group performed

higher than the control group. This is quite in harmony with the findings of Oudat (2012), stating that, within the group of students that were taught science using video instructional method indicated better performance at post-test compared to the pre-test score. It also supported by Barville, (2009), who indicated that there was improvement in terms of post-test- pre-test in the examinations results, as a result of using new teaching styles (instruction), which have more clear effects on the students.

Table 2. Mean and standard deviation of Post-test scores for the experimental and control.

Groups	N	\bar{X}	SD
Experimental	41	44.97	3.89
Control	34	28.30	5.55

Research questions three: What is the difference in achievement between the pre-test and post-test of the students taught using video instruction (experimental group)?

The result required to answer this research question is presented in Table 3. The score of students at pre-test in the experimental group has the

mean of 26.31 with a standard deviation of 5.70, while post-test score had a mean of 44.96 with a standard deviation of 3.89. The post test score of the students is higher than their pre-test scores. The finding is in harmony with that of O'loughlin, (2013), who reported that, in teaching using the video style as a treatment, the learner performed better at the post-test than their pre-test during the experiment.

Table 3. Mean and standard deviation of the pre-test and post-test scores for experimental

Experimental Group	N	\bar{X}	SD
Pre-test	33	26.31	5.70
Post-test	41	44.96	3.83

The test of null hypothesis one is presented in Table 4. The table also reveals that, there was no significant different between the mean achievement of students in the experimental and control group before the treatment, since the p value is greater than the confidence level ($p > 0.05$). For that, the null hypothesis was accepted. This finding is supported by

Fakunle, (2008) in a study on the effect of Computer Augmented Geometry on student's performance. The study had two groups (experimental and control), the result of the study indicated that there was no significant difference between the mean performance of the subjects at pre-test.

Table 4. T-test result of pre-test for experimental and control group.

Group	N	X	S.D	df	t	P
Experimental	33	26.31	5.70	65	0.30	0.78
Control	34	26.26	6.67			

The test of null hypothesis two is presented in Table 5. The table also reveals that, the difference of means was statistically significant ($P < 0.05$). For that, the null hypothesis was rejected; this indicated that, there was a significant difference between the performance of the experimental and the control group. The difference obtained may be as a result of the nature of instruction used in teaching the

experimental group (instructional video) which yields the significant effect on students' achievement. The finding is in agreement with that of Yusuf & Taylor (2007), on the effect of computer supported education on the students' success. The implication of the study confirmed that, the subjects in the experimental group exposed to computer supported lesson progressed significantly than the control group subjects.

Table 5. T-test result of the post-test score for experimental and control group.

Groups	N	X	S.D	df	t	P
Experimental	33	44.97	3.89			
				72	12.08	0.00**
Control	41	28.30	5.55			

The test of null hypothesis three is presented in Table 6. The table also reveals that, the difference of means was statistically significant ($P < 0.05$). For that, the null hypothesis was rejected; this indicated that, there was a significant difference between the performances of the experimental students in the

post-test after pre-test. The finding disagrees with the finding of Groom, (2011), who reported that there was no significant difference in the performance of the students that were exposed to treatment using multimedia (audio-video) when compared with no multimedia

Table 6. T-test result of the pre-test and post-test score.

Group	N	X	SD	df	t	P
Pre-test	33	26.31	5.70			
				73	15.53	0.00**
Post-test	41	44.96	3.83			

CONCLUSION

The use of instructional video as an instructional media in teaching Practical Agricultural Science is effective as the real specimen because the instructional video produce a significant effect on students' achievement in practical agricultural science. Moreover, instructional video can be repeated (replayed) depending on the students' need and all the problems associated with some specimen real such as dangerous nature of some specimen, small size that prevent the naked eye from seeing some specimen and seasonality of some specimen etc are removed which improved students learning.

RECOMMENDATIONS

The following recommendations were made based on the finding of the study.

- i. Teachers of agricultural science in secondary schools should adopt teaching practical agricultural science using instructional video, since it indicates significant effect on the students' achievement and its safe teacher's time.
- ii. School authority should provide an equipped video/multimedia viewing center in their schools to make the use of instructional video easy.

REFERENCES

- Adeboyin, S. F and Torimiro, D. O. (2007). A manual of children-in-Agriculture programme in Nigeria, Ago-Iwoye, Communication, Extension and Publication component, CIAP National Headquarter.pp23.
- Adekunmisi, S. R., and Ojo, A., I. (2009). *Information and Communication Technologies (ICTs)*

- application in the teaching of agricultural sciences based-courses: A case study of lecturers in the College of Agricultural Sciences, Olabisi Onabanjo University, Nigeria (Unpublished Research Work).
- Agwubike, C. C. and Ikeji, C. N. (2006). Approaches for effective vocationalization of secondary school agriculture in Nigeria: The views of agricultural science teachers in Delta state, Nigeria. *Journal of Agricultural Education and Extension*, 12(3), 213-222.
- Ahmed, N. (2008). The use of audiovisual technology in education, manual of teaching Agricultural programme in Nigeria, Agro-communication: pp22
- Andrews, G., Guitar, B., and Howie, P. (2007). Making senior secondary school agriculture truly entrepreneurial: A paper presented at the international conference on Agricultural matters in Nigerian education, University of Nigeria Nsukka 15-18 April.
- Babajide, J. F. T. and Bolaji, O. A. (2005). Perception of lecturers and pre-service teachers towards the use of communication media in teaching pure and applied sciences in related disciplines. Proceedings of Conference, Lagos: pp. 23 – 40.
- Barville, D., & Polifko, M. (2009). Using Digital Video Recorders in Physical Education. *Journal of Physical Education*, 80(1), 17-21.
- Fakunle, R. A. (2008). Utilization of power point presentation software in library institutions of subject specification reference source. Unpublished Masters' Thesis, Kent State University New York.
- Groom, R., Cushion, C. & Nelson, L. (2011). The delivery of video-based performance Analysis by England youth soccer coaches: towards a grounded theory. *Journal of Applied Sport Psychology*, 23(1), 16-32.
- Haruna, I., Okeh, B. I. and Ajayi, S. I. (2008): The need for a functional curriculum preparing teachers of Agriculture in Nigerian Education System. *Nigerian Journal of Agricultural Education* 1(1), 11-15.
- Hee P. C. (2011). Improving the asynchronous video learning model Doctoral dissertation Retrieved on feb, 6 from 2013
- <http://contentdm.lib.byu.edu/utills/getdownloaditem/collectio n/ETD/id/207>Hussein (2006),
- Katayama, V. A., Shambaugh, P., & Doctor, A. (2004). Promoting knowledge transfer with electronic note taking. *Journal of Library and Information Science*, 4(6) 130-136.
- Modebelu Y. & Duvie C. (2012). The main causes of examination malpractices and under achievement in Science. *Journal of Science Teachers Association of Nigeria: 32(1), 75 – 82.*
- Mohsen B., Wan Zah W. A., Maria C. A. & Shaffe M. D., (2013). Effects of Project-based Learning Strategy on Self-directed Learning Skills of Educational Technology Students. *contemporary educational technology*, 4(1), 15-29
- National Examination Council (2012). Chief Examiners Report: Briefing to examiners at marking center: Examinations Council. Minna Niger State.
- Ogunbote, K. O. and Adesoye, A. E. (2006). Quality assurance in Nigerian academic libraries networked multimedia services. *Journal of Library and Information Science*, 3(2), 100-111.
- O'Loughlin, J., Chroinin, D. N., & Grady, D. (2013). Digital Video: The impact on children's learning experiences in Primary Physical Education. *European Physical Education Review*, 19(2), 165-182
- Omagbemi, C. O., and Akinola, B. A. (2004). Academic libraries, the Internet and its potential impact on teaching and learning in Nigerian tertiary institutions. *Journal of Library and Information Science*, 1(13), 34-46.
- Oudat, M. A. (2012). A Comparative study of the impact of some teaching styles

- applied on certain physical and skill variables in basketball for the Faculty of Physical Education and Sport Science Students at the Hashemite University. *International Journal of Academic Research* 4(6), 83-89.
- Sambo (2005). *Research Methods in Education*. Stirling-Horden Publishers (Nigeria) Ltd, Lagos.
- Ubogu, F. N. (2006). Trend in digital library science in academic libraries in south- Africa: Library profiles and ETD system. Conference proceeding of 44th annual National Conference and AGM meeting of Nigerian library Association held at Ajai Suit FCT, Abuja Nigeria (pp18-19).
- Yusuf, G. A. & Taylor, B. A. (2007). Increasing play-related statements in children with autism through the use of video modeling. *Journal of Developmental and Physical Disabilities*, 11(5), 253-264.