Development and Evaluation of Instructional Video for Teaching Technical Drawing in Nigerian Universities

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Abstract

This study developed and evaluated instructional video for teaching Technical Drawing to Technical education students in Nigerian Universities and also tried out to know if this teaching strategy affects students' performance. Four research questions and one hypothesis were used for the study. The study adopted Research and Development (R&D) design for production of the video and One-group Pretest-Posttest Design to test the students' performance. The population of this study comprised of 154 final year students and 58 lecturers in Technical Education Department from five public Universities in South-South geopolitical zone in Nigeria from which 100 students and 10 Technical Drawing lecturers were selected for the study through purposive sampling technique. To collect data for the study, the researchers developed instructional video and was faced and content validated by five experts using 40-item structured questionnaire. The student's performance was measured through 20-item pretest and posttest multiple-choice type of test. Cronbach alpha statistics was used to determine the reliability coefficient of the instrument which gave a value of .86. A five-point rating scale was provided for the respondents to make their responses on the research questions. The research questions were analyzed using Mean and standard deviation while t-test was used to test the hypothesis at .05 level of significance. The findings of the study revealed that the contents, specific objectives, instructional methods, materials, learners' task and evaluation techniques of the developed instructional video are appropriate for teaching Technical Drawing to Technical education students in Nigerian universities. The study further revealed a significance difference between the students taught with the video and students taught without the video. Therefore, the null hypothesis was rejected. The researchers recommend among others that the video can be a supplementary material for distance learning, especially for learners who can learn independently. That the National Universities Commission should adopt the developed Technical Drawing instructional video for teaching Technical Education students in Nigerian Universities.

Keywords: *Technical/Technology Education, Technical Drawing, Instructional Video, Nigeria, Universities*

Introduction

Education remains the best tool to develop physical, mental and moral capability of individual to become a good, industrious and self-reliant member of the society. Globally, countries of the world continually sought to improve the quality of her education, to move beyond students working individually on exams that require them to respond to pre-formulated problems within the narrow traditional boundaries of individual school subjects (Gerald, Augustine and Lucy, 2013). According to Latha (2019), Indhumathy and Ramakrishnan (2020), education is facing technological revolution where a number of tools and apps have been introduced into education to make the process of teaching, learning and evaluation simple. In the view of Owo and Deebom (2020), technological revolution in education could be described as the appropriate application of scientific and technical knowledge and skills to proffer solutions to the numerous insatiable educational advancements.

According to Ogbuanya, Nweke and Ugwoke (2017), Technical/Technology education comprise both general and specific education elements which deals with the application of technological skills and expertise to meet its targets. In Nigerian educational system, universities offer Technical/Technology education programmes leading to the award of Bachelor of Science in Education (B.Sc Ed.) in Automobiles, Building, Electrical/Electronic Technology, Mechanical and Metalwork Technology and Woodwork Technology for the purpose of promoting the inculcation of requisite practical skills in the students for increased productivity and sustainability upon graduation (FRN, 2013 Ayonmike & Okeke, 2015; Ismail & Mohammed, 2015; Auta, 2017; Ayonmike, 2020; Owo & Deebom, 2020).

Today, Technical Drawing in Nigerian universities is a compulsory course offered in Technical/Technology Education Department (Medupin, Abubakre, Adebayo, Enock & Sulayman, 2015; Okolocha & Baba, 2016). Technical Drawing according to Igbinomwanhia and Aliu (2013) and Laguador, (2014), is a means of clearly and succinctly communicating all of the information necessary to transform an idea or a concept into reality. In general, it provides necessary information about the shape, size, surface quality, material, tolerance, manufacturing process etc., of the design. The acquisition of Technical Drawing skills involves the utilization of modern instructional resources and methods which will help the learners to successfully replicate in real life, the skills that was transferred during the teaching-learning process (Oke & Olakotan, 2019).

Okoye and Okwelle (2013), Latha (2019), Edem and Ekon (2021), stated that technological revolution introduced to improve the quality of education are modern instructional resources such as video-based instruction. Robles and Acedo (2019), highlighted that in the escalating dependence on technology, the development of educational materials such as comics or videos may serve as a platform in meeting the changing needs of the students. The importance of videos in education cannot be over emphasized. According to Latha (2019), Robles and Acedo (2019), institutions of higher learning in developed nations use video solutions, integrated into their learning management systems for teaching and students' assignment. In the view of Aquino (2022), the instructional video refers to the creation of videos that a teacher makes outside of class contact hours that specifically teach a concept or content. Woolfitt (2015), Edem and Ekon (2021), described video-based instruction as recorded content that has sound and motion which can be stored, delivered live and streamed simultaneously to multiple devices.

Kuiper, Carver, Posner, and Everson (2015), identified that this approach means that students can dramatically impact the pace of the course as it enables learners to proceed at their

own rate. In the same vein, Ekwueme, Ekon and Ezenwa-Nebife (2016), Edem and Ekon (2021), stated that the use of Video instruction increases the probability of students to learn more, retain and achieve better academic performance. Edem and Ekon (2021), posited that arranging instruction in video-based clips and programmed structures could assist learners to gain proficiency in organizing their thought while observing the pictorial presentation on the watched clip. Gibbs, (2015), noted that the use of video in tertiary education as instructional resources is cost effective, time effective and sustainable method of teaching and learning. Robles and Acedo (2019), noted that there is mounting interest in validating educational videos for learning.

Unfortunately, Okoye and Okwelle (2013), Ekon and Edem (2015), Ayonmike (2020), Birabil and Ogeh (2020), Edem and Ekon (2021), stressed that instructional videos are not adequately utilized for teaching in Nigerian Universities due to lack of development of such instructional videos. Similarly, Ajegbelen (2016), Singh-Pillay and Sotsaka (2017), Uddin and Nwachokor (2019) and Ayonmike (2020), stated that Technical Education department, lack modem sophisticated instructional resources because of lack of interest and inability of the lecturers to develop them. Hence, this study seeks to develop and validate Technical Drawing instructional video for the teaching Technical Education students in Nigerian universities.

Statement of the Problem

Technical education ensures that relevant skills are imparted to students for self-reliance and gainful employment. However, recent researches revealed that Technical education in Nigerian universities are lacking modem sophisticated instructional resources and facilities for impartation of innovative skills thereby making it uneasy for graduates to secure employment or become self-employed which leads to increasing rate of graduates' unemployment. Previous researches also stated that there no instructional video for teaching Technical drawing in Nigerian Universities. Hence, in order to improve the standard of Technical drawing instruction, there is need to develop a valid, reliable and usable instructional video, which could enhance effective transfer of the skills acquired by Technical Education students in Nigerian Universities to technological innovation for self-reliance and gainful employment. Therefore, this study seeks to develop Technical drawing instructional video for teaching Technical Education students in Nigerian universities.

Purpose of the Study

The purpose of the study was to:

1. Determine the contents, specific objectives, instructional methods, materials, learning task and evaluation techniques considered appropriate for inclusion in the Technical Drawing instructional video for teaching Technical education students in Nigerian universities.
2. Determine the level of the developed Technical Drawing instructional video for teaching Technical Education in terms of visual quality; audio quality and production quality.
3. Try-out the Technical Drawing instructional video on students taught with the video and students taught without the video.

Research Questions

The following research questions guided the study:

1. What are the contents, specific objectives, instructional methods, materials, learning task and evaluation techniques considered appropriate for inclusion in the Technical Drawing instructional video for teaching Technical education students in Nigerian universities?
2. What is the level of the developed Technical Drawing instructional video for teaching Technical Education in terms of visual quality; audio quality and production quality?

3. To what extent are students taught with the instructional video and students taught without the instructional video understand Technical Drawing?

Hypothesis

One hypothesis was formulated to guide the study:

$H0_1$: There is significant difference in the mean response of students taught with the Technical Drawing instructional video and students taught without the instructional video in Nigerian universities.

Methodology

The study was carried out in Universities in South-South geopolitical zone in Nigeria. The study adopted Research and Development (R&D) design for production of the video and One-group Pretest-Posttest Design to test the students' performance. Alshahad (2013), stated that R & D is the use of research methods to design new products and procedures followed by the use of research methods to field test, evaluate and refine the products and procedures until they meet specified criteria of effectiveness, quality or similar standards. The video footage was produced beginning from writing content, scouting location, getting permit, equipment procurement, shooting the video, editing and coding the video. The population of this study comprised of 154 final year students and 58 lecturers in Technical Education Department from five public Universities in South-South geopolitical zone in Nigeria from which 100 students and 10 Technical Drawing lecturers were selected through purposive sampling to gather information and data in this study. In the same vein, student's performance was measured two times: once before and once after exposing a non-random group of participants to a certain intervention/treatment (Reichardt, 2019).

To collect data for the study, the researchers developed an instructional video and was faced and content validated by three experts in Industrial Technical Education Department and two Documentary Film Production experts in the Department of Mass Communication, University of Nigeria, Nsukka using a 40-item structured questionnaire titled: Development of Instructional Video for Teaching Technical Drawing in Nigerian Universities Questionnaire. The student's performance was measured through 20-item pretest and posttest multiple-choice type of test. A five-point rating scale of Strongly Agreed (SA=4.50-5.00), Moderately Agreed (MA=3.50-4.49), Lowly Agreed (LA=2.50-3.49), Strongly Disagreed (SD=1.50-2.49), Undecided (U=1.00-1.49) was provided for the lecturers and students to evaluate research questions. In order to ensure the reliability of the instrument, Cronbach Alpha statistics was used to analyze the data collected which yielded a reliability coefficient of 0.86 which shows the instrument was reliable for the study.

The researchers administered the instrument directly to the lecturers and students in the Universities with the help of three research assistants who were instructed on what was required. The instrument was collected immediately after completion which recorded 100% return rate. Mean and Standard Deviation were used to analyzed the research questions. Any mean response of 3.50 and above was considered Strongly Agreed while mean response below 1.50 was regarded as Strongly Disagreed.

Presentation of Data Analysis and Results

Research Question 1: What are the contents, specific objectives, instructional methods, materials, learning task and evaluation techniques considered appropriate for inclusion in the Technical Drawing instructional video for teaching Technical education students in Nigerian universities?

Table 1: The contents, specific objectives, instructional methods, materials, learning task and evaluation techniques considered appropriate for inclusion in the Technical Drawing instructional video.

S/N	**Item Statement:** Contents appropriate for the development of Technical Drawing instructional video	Frequency					Mean	Dec.
		SA (5)	MA (4)	LA (3)	SD (2)	U (1)		
1.	Identification of the various instruments, equipment	9	1	0	0	0	3.90	SA

	and materials.							
2.	Explanation of the maintenance of instrument and equipment.	8	1	1	0	0	3.70	SA
3.	Description of the various standards of drawing sheets.	7	2	1	0	0	3.60	SA
4.	Layout drawing sheets with Margin and Title block.	7	3	0	0	0	3.70	SA
5.	Definition and illustration types of lines, dimensions, sections and lettering	9	1	0	0	0	3.90	SA
6.	Definition and illustration of conventional signs and symbols.	9	1	0	0	0	3.90	SA
7.	Illustration of parallel, vertical, horizontal and perpendicular lines.	8	2	0	0	0	3.80	SA
8.	Division of a straight line into given number of equal parts.	8	2	0	0	0	3.80	SA
9.	Construction and bisection of lines and angles.	8	2	0	0	0	3.80	SA
10.	Definition of a circle, properties (radius, diameter, normal tangent, circumference etc.)	9	1	0	0	0	3.90	SA
11.	Identification and construction of types of polygons.	9	1	0	0	0	3.90	SA
12.	Definition and construction of different types of ellipse.	8	2	0	0	0	3.80	SA
13.	Definition and construction of cycloid, involute, parabola and epicycloid	7	3	0	0	0	3.70	SA
14.	Illustration of intersections of solids and planes.	8	2	0	0	0	3.80	SA
15.	Explanation and construction isometric and oblique projections.	7	3	0	0	0	3.70	SA
16.	Explanation of the principles of orthographic projections.	9	1	0	0	0	3.90	SA
17.	Definition and illustration of first and third angle projections.	8	2	0	0	0	3.80	SA
18.	Definition of CAD organization and applications.	8	1	1	0	0	3.70	SA
19.	Illustration of difference between CAD and Manual drafting.	8	2	0	0	0	3.80	SA
20.	Illustration of production of CAD blue print.	7	3	0	0	0	3.70	SA
	Cluster Total						**3.98**	**SA**
B.	**Item Statement A: Specific objectives**							
1.	The objectives were clearly stated in the video.	7	3	0	0	0	3.70	SA
2.	The objectives were attainable and achievable by the students.	8	2	0	0	0	3.80	SA
3.	The objectives were presented in the video were parallel with the content of the video.	8	1	1	0	0	3.70	SA
4.	The objectives were aligned with Most Essential Learning Competencies.	8	2	0	0	0	3.80	SA
5.	The objectives were helpful to enhance the students critical thinking skills.	6	3	1	0	0	3.50	SA
	Cluster Total						**3.70**	**SA**
C..	**Item Statement B: Instructional methods**							
6.	Demonstration method.	8	2	0	0	0	3.80	SA
7.	Buzz method.	6	3	1	0	0	3.50	SA

8.	Peer tutoring method.	7	2	1	0	0	3.60	SA
9.	Lecture method.	7	3	0	0	0	3.70	SA
10.	Discussion method.	8	2	0	0	0	3.80	SA
	Cluster Total					0	**3.68**	**SA**
D.	**Item Statement C: Instructional materials/facilities**					0		
11.	Text books/lecture notes.	8	2	0	0	0	3.80	SA
12.	Multimedia Projector.	8	2	0	0	0	3.80	SA
13.	Interaction Whiteboard/Electronic Class Roll.	6	3	1	0	0	3.50	SA
14.	Drawing sets and equipment.	7	3	0	0	0	3.70	SA
15.	Desktop/Laptop Computer.	8	2	0	0	0	3.80	SA
	Cluster Total						**3.72**	**SA**
E.	**Item Statement D: Learning Task**							
16.	The exercises provided in the video will keep the students engaged.	9	1	0	0	0	3.90	SA
17.	The exercises provided will reinforce concepts necessary for mastery.	8	1	1	0	0	3.70	SA
18.	The activities in the video will enhance the understanding of the lesson.	8	2	0	0	0	3.80	SA
19.	The exercises provided can be used to promote active learning.	8	1	1	0	0	3.70	SA
20.	The learning task in the video allows the teacher to monitor learner's performance.	7	2	1	0	0	3.60	SA
	Cluster Total						**3.74**	**SA**
F.	**Item Statement D: Evaluation techniques**							
21.	Ipsative Evaluation.	7	2	1	0	0	3.60	SA
22.	Criterion-referenced Evaluation.	6	3	1	0	0	3.50	SA
23.	Norm-referenced Evaluation.	7	2	1	0	0	3.60	SA
24.	Formative Evaluation.	8	2	0	0	0	3.80	SA
25.	Summative Evaluation.	8	2	0	0	0	3.80	SA
	Cluster Total						**3.66**	**SA**
	Overall Mean						**3.75**	**SA**

NOTE: SA=4.50-5.00, MA=3.50-4.49, LA=2.50-3.49, SD=1.50-2.49, U=1.00-1.49

The data presented in Table 1 shows overall mean of 3.75 on the contents, specific objectives, instructional methods, materials, learning task and evaluation techniques for teaching Technical Drawing to Technical Education students. The result indicates that the experts strongly agreed that the contents, specific objectives, instructional methods, materials, learning task and evaluation techniques are appropriate for inclusion in the instructional video for teaching Technical Drawing to Technical Education students in Universities in South-South geopolitical zone, Nigeria.

Research Question 2: What is the level of the developed Technical Drawing instructional video for teaching Technical Education in terms of visual quality; audio quality and production quality?

Table 2: The level of the developed Technical Drawing instructional video for teaching Technical Education in terms of visual quality; audio quality and production quality.

S/N	**Item Statement:** Visual quality of the developed Technical Drawing instructional video	**Frequency**					**Mean**	**Dec.**
		SA (5)	**MA (4)**	**LA (3)**	**SD (2)**	**U (1)**		

1.	Text graphics remain on the screen long enough for the average reader to read them.	8	1	1	0	0	3.70	SA
2.	Videos uses appropriate text format, images or symbols to highlight important learning concepts effectively	8	2	0	0	0	3.80	SA
3.	Video text available includes only minor errors	7	2	1	0	0	3.60	SA
4.	The background is appropriate for the video lesson.	8	1	1	0	0	3.70	SA
5.	Video is recorded, editing and delivered in the highest HD resolution, typically 1920x1080 or 1440x1080.	8	2	0	0	0	3.80	SA
	Cluster Total						**3.72**	**SA**
B.	**Item Statement A:** Audio quality of the developed Technical Drawing instructional vide							
6.	The audio presents a sense of likability and friendliness.	8	1	1	0	0	3.70	SA
7.	There are no unwanted sounds	9	0	1	0	0	3.80	SA
8.	There is no background distracted colors	8	2	0	0	0	3.80	SA
9.	Off-camera narration is clearly audible and listenable.	8	1	1	0	0	3.70	SA
10.	Audio level of the video was consistent throughout the video with no significant high or low incidents.	9	1	0	0	0	3.90	SA
	Cluster Total						**3.78**	**SA**
C.	**Item Statement B:** Production quality of the developed Technical Drawing instructional vide							
11.	The length of the video is appropriate to material covered and engaged attention span of intended audience.	8	2	0	0	0	3.80	SA
12.	Content is organized and presented in a logical, easy to follow sequence.	9	0	1	0	0	3.80	SA
13.	Narrator uses key phrases to set the tone or mood of the video.	8	1	1	0	0	3.70	SA
14.	Voice narration is delivered at a speed that is both natural sounding, and allows viewers time to process and comprehend the content.	7	1	2	0	0	3.50	SA
15.	Viewers feel a positive connection with the speaker or narrator based on how the narrator express himself to the audience.	8	2	0	0	0	3.80	SA
	Cluster Total						**3.72**	**SA**
	Overall Mean						**3.74**	**SA**

NOTE: SA=4.50-5.00, MA=3.50-4.49, LA=2.50-3.49, SD=1.50-2.49, U=1.00-1.49

The data presented in Table 2 shows Overall mean of 3.74 on the visual quality, audio quality and production quality for teaching Technical Drawing to Technical Education students. The result indicates that the experts strongly agreed that the visual quality, audio quality and production quality are appropriate for teaching Technical Drawing to Technical Education students in Universities in South-South geopolitical zone, Nigeria.

Research Question 3: To what extent are students taught with the instructional video and students taught without the instructional video understand Technical Drawing?

Table 3: The extent students taught with the instructional video and students taught without the instructional video understand Technical Drawing.

S/N	STUDENTS UNDERSTANDING OF TECHNICAL DRAWING	Students Taught with the Video		Students Taught Without the Video	
		X	SD	X	SD
1.	I can identify the various instruments, equipment and materials.	3.83	2.48	3.68	1.36
2.	I can explain the various methods of maintaining drawing instrument and equipment.	4.58	1.65	2.57	2.28
3.	I know the various standards of drawing sheets.	4.64	2.54	3.05	2.36
4.	I know the layout drawing sheets with Margin and Title block.	4.58	2.68	3.14	1.28
5.	I can define and illustrate the types of lines, dimensions, sections and lettering.	4.53	2.64	2.77	2.25
6.	I can define and illustrate the conventional drawing signs and symbols.	4.73	3.53	3.53	1.45
7.	I can illustrate the parallel, vertical, horizontal and perpendicular lines.	3.77	1.66	2.67	1.39
8.	I can divide a straight line into given number of equal parts.	4.82	2.75	2.86	2.29
9.	I can construct and bisect lines and angles.	4.76	2.73	3.18	1.46
10.	I can define a circle and state properties.	3.84	2.67	2.93	2.35
11.	I can identify and construct different types of polygons.	4.59	2.76	2.79	2.36
12.	I can define and construct different types of ellipse.	3.91	3.58	3.76	2.39
13.	I can define and construct cycloid, involute and parabola.	3.89	2.65	3.53	2.34
14.	I can illustrate the different intersections of solids and planes.	4.67	3.52	2.89	1.40
15.	I can explain and construct isometric and oblique projections.	4.53	1.68	3.96	2.38
16.	I can explain the principles of orthographic projections.	4.58	2.63	2.98	2.34
17.	I can define and illustrate first and third angle projections.	3.88	2.47	3.27	2.36
18.	I can define CAD organization and applications.	4.63	2.55	2.75	1.28
19.	I can illustrate the difference between CAD and Manual drafting.	4.69	2.49	2.83	1.34
20.	I can illustrate and produce CAD blue print.	3.82	1.62	3.79	1.36
	Overall Mean	**4.72**	**2.96**	**3.57**	**2.08**

NOTE: SA=4.50-5.00, MA=3.50-4.49, LA=2.50-3.49, SD=1.50-2.49, U=1.00-1.49

The data presented in Table 4 shows Overall Mean and Standard Deviation of 4.72, 2.96 and 3.57, 2.08 respectively on students taught with the Technical Drawing instructional video and students taught without the instructional video. The result indicates that the students taught with the instructional video strongly agreed that they understand Technical Drawing while students taught without the video moderately understand Technical Drawing in Technical Education students in Universities in South-South geopolitical zone, Nigeria.

Hypothesis 1: There is significant difference in the mean response of students taught with the Technical Drawing instructional video and students taught without the instructional video in Nigerian universities.

Table 4: Independent t-test of mean response of students taught with the Technical Drawing instructional video and students taught without the instructional video in Nigerian universities.

Variable	N	$\bar{X}$	SD	Mean Diff.	df	t-cal.	t-crit.	Dec.
Students taught with instructional Video	65	4.72	2.96					
				1.15	98	2.30	1.66	S
Students taught without instructional Video	35	3.57	2.08					

Note: S = Significance

Data analysis in Table 4 indicates that the mean score of students taught with Technical Drawing instructional video (experimental group, 4.72) was greater than the mean score of students taught without Technical Drawing instructional video (control group, 3.57). the Table also indicate that the t-cal was 2.30 while the t-crit. was 1.66 at 98 degree of freedom and mean difference of 1.15. Hence, since the t-cal. was greater than t-crit., hypothesis of significance difference between the mean response of students taught who were taught with the instructional video and those who were taught without the instructional video was upheld.

Discussion of Findings

The data presented in Table 1 shows overall mean of 3.75 on the contents, specific objectives, instructional methods, materials, learning task and evaluation techniques for teaching Technical Drawing to Technical Education students. The result indicates that the experts strongly agreed that the contents, specific objectives, instructional methods, materials, learning task and evaluation techniques are appropriate for inclusion in the instructional video for teaching Technical Drawing to Technical Education students in Universities in South-South geopolitical zone, Nigeria. The finding of this study is in agreement with the finding of Gambari and Yusuf (2014), Aminu (2015) and Hassan (2019), who stated that expert opinions is required for selection of contents considered appropriate for inclusion in instructional module for teaching and learning.

The data presented in Table 2 shows grand mean of 3.74 on the visual quality, audio quality and production quality for teaching Technical Drawing to Technical Education students. The result indicates that the experts strongly agreed that the visual quality, audio quality and production quality are appropriate for teaching Technical Drawing to Technical Education students in Universities in South-South geopolitical zone, Nigeria. The finding of this study is in agreement with the finding of Alshahad (2013), Hassan (2019), Archibong, George and Umoudo (2022), who stated that instructional module involves objectives, methods, materials and evaluation techniques that are considered appropriate for the topic to be taught.

The data presented in Table 2 shows grand mean of 3.74 on the visual quality, audio quality and production quality for teaching Technical Drawing to Technical Education students. The result indicates that the experts strongly agreed that the visual quality, audio quality and production quality are appropriate for teaching Technical Drawing to Technical Education students in Universities in South-South geopolitical zone, Nigeria. This is in line with the study conducted Aquino (2022), who noted a significant difference on the Performance of Grade 11 Students in Pretest and Posttest utilization of instructional video developed for teaching Statistics and Probability.

The data presented in Table 4 shows Overall Mean and Standard Deviation of 4.72, 2.96 and 3.57, 2.08 respectively on students taught with the Technical Drawing instructional video and students taught without the instructional video. The result indicates that the students taught with the instructional video strongly agreed that they understand Technical Drawing while students taught without the video moderately understand Technical Drawing in Technical Education students in Universities in South-South

geopolitical zone, Nigeria. This is in line with the study conducted by Robles and Acedo (2019), who stated that there was a significant difference between the pre-test and the post-test recorded video for teaching in Araling Panlipunan. The finding confirms with that of Chawla and Deshwal (2013) who in their studies stated that students who used CAI performed better than the students who did not use CAI.

Conclusion

This study will be of great significant to lecturers and student in the Department of Technical Education in Nigerian Universities. The developed instructional video will serve as supplementary resources for teaching Technical Drawing. The developed instructional video for teaching and learning Technical Drawing at the University level is suitable in terms of its content, instructional design, technical design, and social consideration. It is hoped that a well-developed and adequately validated instructional video of this nature will enhance effective teaching of Technical Drawing to Technical Education in Nigerian Universities.

Recommendations

From the findings of study, the following recommendations were made:

1. The developed Technical Drawing instructional video should be used to teach Technical Education students in Nigerian Universities.
2. Public universities and Technical Education stakeholders should organize workshop and training programmes for lecturers on how to develop instructional video in every areas of Technical Education.
3. Support staff like video editors should be employed in Technical Education Department at the University level in Nigeria.
4. Public universities should provide grant for the development of instructional videos in every aspect of Technical Education to enable the Universities produce employable graduates with indebt practical knowledge.

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