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DEVELOPMENT OF A MOBILE APPLICATION FOR LEARNING BASIC TECHNOLOGY CONCEPTS IN UPPER-BASIC SCHOOLS

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Abstract
Despite the quick advancements in technology, students still have to attend demanding in-person classes. However, students can get curriculum-based instruction remotely via mobile devices. As a result, a mobile application was developed for usage in Nigerian upper basic schools using the ASSDURE (Analysis, Statement of Objectives, Design, Development, Utilization, Response, and Evaluation) paradigm. This study's model-type design and development research included a single-group pre-test-post-test design. The population consisted of students from upper-basic schools in Nigeria, specifically from upper-basic school two. Findings indicated that the developed application improved students' academic performance, as evidenced by their respective pre- and post-test performance percentage scores of 53.0% and 66.4%. The mobile app received positive evaluations from experts in instructional design, basic technology, and educational technology, with scores of 85%, 79.7%, and 88.3%, respectively. The study's conclusions indicate that the developed application is appropriate for educational purposes. It is inferred that pupils will perform better academically. Thus, among other things, it was proposed that mobile applications be included in basic technology instruction.

Keywords: basic technology concept, development, learning, mobile application, upper basic school

Introduction

Modern technological advancements and inventions are founded on the foundations of science and technology. As a result, every country works to advance its scientific and technological standing in the globe. To meet the objectives for 21st-century education, the paradigm shift has created a multitude of benefits and opportunities, particularly concerning Information and Communication Technologies (ICTs). In these, students are supposed to be able to communicate, think critically, become competent, and work with others. Thus, access to curriculum materials at any time and from any place is crucial, as is teaching mobility.

According to Rouse (2019), information and communication technology (ICT) is the infrastructure and constituents that enable modern computing. ICT encompasses both the internet-enabled and wirelessly networked mobile worlds. Along with more antiquated ICT elements like landlines, radios, and televisions that are still in common usage today, it also includes more contemporary ones like robotics and artificial intelligence. The environment in which students engage in academic activities needs to be evaluated to make sure that their learning is not jeopardized (Onojah, Onojah & Jayeosimi, 2023).

In the twenty-first century, instruction mobility is critical to facilitating the shift from a teacher-centered to a learner-centered model of education. As a result, a paradigm change toward mobile learning is required, one that takes into account the creation and design of instructional materials for learning objectives. By using Smart Learning, educational institutions can create inclusive, equitable, and sustainable learning environments (Makinde, Ajani, & Abdulrahman, 2023). Educational technology, a component of the education industry that concentrates on efficient communication and instruction through technological instruments, is vitally needed to do this. The thoughtful application and integration of diverse media in educational technology emphasizes communication skills and methods of instruction (Dey, 2020). Though positive attitudes of students toward the use of these technologies will influence their utilization of such technologies for learning, it was advised that schools hire educational technologists who can help with the appropriate use of assistive technology tools to enhance classroom instruction (Soetan, Onojah, Alaka, & Onojah, 2021).

The Association for Educational Communications and Technology (AECT) defines educational technology as the science and practice of developing, applying, and overseeing suitable technological procedures and resources to improve learning and performance. In order to improve performance and foster learning, it also addressed the ethics and research around the creation, use, and management of appropriate technological policies and tools (AECT, 2023). Technology use in education has increased across the board, but educators now have to decide which of the many tools at their disposal is best suited for their pedagogical approaches (Akpeji et al., 2022). Educational technology is a methodical technique to conceive the complete learning process in terms of separate objectives and communication, utilizing a combination of human and non-human resources to provide more effective instruction (Alam, 2018).

Prevocational subjects including metalworking, woodworking, basic electrical and electronic work, technical drawing, car maintenance, building and food technology, and computer studies are all included in the category of basic technology. The National Education Research and Development Council (NERDC) in Nigeria established the objectives for teaching the subject at the upper basic school level in 2007. In order to link students' interests and talents with a career path of their choice, some of these include promoting technology literacy, exposing students to the workforce, and cultivating a positive mindset toward work as a source of identity, power, and livelihood while integrating technical resources (NERDC, 2022). Instructors can encourage and assist their students' learning activities by using instructional tools. By methodically merging human and material resources, these resources effectively solve educational challenges (Soetan, et al., 2021).

Mobile applications designed for educational purposes can include a lesson plan, assessment, course, and other pedagogical elements. The end product is a user-supplied URL that shows up in the browser as read-only HTML or as a hyperlink (Glaser, 2019). Smartphones typically run one of two operating systems: Android, which is produced by Google, or the iPhone Operating System (iOS), which is used by Apple for its mobile devices (though there are a few others, including Windows and Blackberry) (Rouse, 2019). One of the modern resources that may be used in the classroom is mobile technology (Chukwuemeka et al., 2021).

Overcrowding, a lack of learning resources, and frequent closures due to pandemics and civic crises characterize modern education. These factors need the development of more efficient learning models that make use of technology to motivate students to actively participate in their education (Falode et al., 2022). A mobile community emerges in the classroom when mobile technology is employed in teaching. Therefore, learning through mobile technologies is widely recognized to encompass more than merely using portable devices; rather, it involves learning across curriculum-based resources with enhanced learner cooperation and communication—a vision that is crucial for the twenty-first century. A classroom that reaches its full educational potential, according to Acevedo-Borrega et al. (2022), will strive to promote not just increased academic accomplishment but also motivation, autonomy, the development of 21st-century skills, logical thinking, innovation, and, of course, learning for the future.

Evaluation is the process of figuring out how valuable and effective the programs designed to help students with the teaching and learning process are. At this point, the effectiveness of the interactive mobile application was evaluated by the researchers using the sum of each participant's pre-and post-test scores (Falode et al., 2022). A curriculum or program is evaluated by critically examining it to ascertain its significance, worth, and effectiveness in reaching predefined objectives. To put it briefly, assessment in an educational context is the procedure designed to discover proof that the lessons designed for pupils are effective, according to Ferriman (2013).

Kirkpatrick's notion, which holds that training effectiveness can only be attained in connection to level and learners' reactions, supports this. In support of this, Clark (2022) added that critical components that influence the development of desired behaviors are learners' attitudes, knowledge, and abilities. Due to its openness and ability to support learning through mobile apps, the model has four stages that recognize the training field's significance (Rouse, 2019). While several assessment models are pertinent to education, the current study is focused on the first two levels of the Kirkpatrick model, which include learning and reaction. In order to assess the creation of the mobile app on workshop accidents as well as materials and processing in basic technology in Nigerian upper basic schools, the Kirkpatrick evaluation model will be used. Also, the Kirkpatrick model evaluation, created by Donald L. Kirkpatrick in 1954, must be used to evaluate the efficacy of training programs. Even if there are barriers to effective study, students' learning rates can be raised by employing certain strategies and instruments. The AMOS study technology model graphically illustrates these challenges, their psychological impacts, and the remedies (Onojah, Onojah, Olumorin, & Abimbola, 2020).

According to several studies, including Kolb (2019), Gezgin (2019), and Wan Daud et al., (2021), there are distinctions between the ways that men and women use and engage with these technologies, particularly with regard to competency, attitude, and utilization. Women are underrepresented in computer science-related fields, computer clubs, and academic courses, according to Gezgin (2019). In addition, women use computers at home less often than males do. This is corroborated by Chukwuemeka et al. (2020), who note that female students are less skilled at utilizing the Internet as an ICT tool for instruction and learning. The author also pointed out that women see computers as means for completing tasks like texting, conversing, emailing, and Internet browsing, whereas men see them as recreational tools, suggesting that males use technology for pleasure. Men are also more likely than women to be adept with computers and to view them favorably; nevertheless, men are more worried about the price of mobile devices. Michaud (2019) asserts that gender disparities in technological preferences and adoption behaviors are statistically significant. According to the poll, women use multi-user gaming and audio and video creation at a lesser rate than men do. These activities are used by men twice as often as by women following the earlier research's identification of the paradigm shift from teacher-centered to learner-centered instruction.

This study used the ASDDURE to test for Analysis of learners' characteristics, Statement of objectives, Design, Development, Utilization, and Evaluation investigating the interactivity effect of gender in the development of a mobile learning app for teaching a selected set of basic technology concepts to Upper Basic schools in Nigeria. The structured five-step process known as the ADDIE instructional design model consists of analysis, design, development, implementation, and evaluation (Criollo et al., 2021). The first two levels of Kirkpatrick's Evaluation model, which act as guidelines at both the formative and summative stages and the two models of ADDIE and ASSURE were used to conceptualize the current model.

Purpose of the Study

This study's primary goal was to design and develop a mobile application that upper-basic schools in Nigeria could use to teach a select set of basic technology concepts. In particular, this research:

1. created a mobile application covering specific fundamental technological principles for upper basic schools in Nigeria;
2. investigated how the application affected students' understanding of workshop safety, materials, and processes;
3. examined the developed mobile application on learning workshop safety and materials and processing by educational technologists;
4. determined the developed mobile application on learning workshop safety and materials and processing by instructional design experts; and
5. evaluated the developed mobile application on learning workshop safety and materials and processing by basic technology teachers.

Research Questions

This study provided answers to the following research questions.

1. What are the processes involved in developing the mobile application for teaching basic technology?
2. How does the developed mobile application affect learning workshop safety and materials and processing?
3. How is the developed mobile application for learning about workshop safety, materials, and processing rated by educational technologists?
4. What is the instructional design experts' rating of the developed mobile application on learning workshop safety, materials, and processing?
5. How do basic technology teachers rate the developed mobile application for learning workshop safety and materials and processing?

Method

This study was a design and development research of the model type. It involved developing and evaluating a basic technology learning application (BTLA). This research method employed a design and development-based research of one group pre-test post-test quasi-experimental design and experts' validation.

Also, the model adopted three levels of ADDIE and three levels of ASSURE model: ADD (Analysis, Design, and Development) and three levels of ASSURE (Statement of Objectives, Utilisation and Response). The study saw the Utilisation and Response of learners in place of Implementation in the ADDIE model. However, the evaluation level is traditionally in the two models. To cater for this, the Kirkpatrick model of evaluation was employed out of which the first two levels of the model were used (learning and reaction phases). The ASDDURE model is denoted by (Analysis, Statement of Objectives, Design, Development, Utilisation, Response, and Evaluation of the mobile application) as conceptualized by the researcher.

Research instruments used to gather relevant data for the study include Basic Technology Learning Application (BTLA); Educational Technology Experts' Questionnaire (ETEQ; Instructional Design Experts' Questionnaire (IDEQ) and Basic Technology Teachers' Assessment Questionnaire (BTTAQ

A test-retest reliability was employed to obtain data over two weeks to test the reliability of the instruments. Pearson Product Moment Correlation Coefficient was used to analyze the Performance Test Instrument which came out with a reliability coefficient of 0.83. Cronbach Alpha was used to analyze the Educational Technology Experts' Assessment, Instructional Design Experts' Assessment, and Basic Technology Experts' Assessments 0.90, 0.72, 0.79, and 0.94 respectively.

Procedure for the Evaluation of developed mobile application in learning workshop accidents and material technology in basic technology

The development and evaluation of a mobile application on workshop accidents and material and processing was carried out using research models (ADD + SUR + Evaluation of Kirkpatrick = ASDDURE). This model was conceptualized by the researcher to arrive at a unification of three levels of ADD(IE) model (Analysis, Design, and Development), three levels of (A)S(S)UR(E), and two levels of Kirkpatrick evaluation model (Reaction and Learning).

Additionally, the model Analysis, Statement of Objectives, Design, Development, Utilisation, Response from Learners, and Kirkpatrick's Evaluation are thereby explained as they were sequentially applicable to the exercise on the development and evaluation of the mobile application on workshop accidents and material technology.

Findings and Discussion

Research question one: What are the processes involved in developing the mobile application for teaching basic technology?

The first research question explained the steps taken in creating a mobile application that teaches basic technological processing, materials, and workshop safety. Research models were utilized in the creation process. Three ADDIE levels (Analysis, Design, and Development) and three ASSURE levels (Statement of Objectives, Utilization, and Response) were incorporated into the model. The study views the learners' Response and Utilization as taking the role of the ADDIE model's Implementation. Nonetheless, assessment is a part of both approaches. In order to address this, the Kirkpatrick assessment model was utilized, with the learning and reaction (attitude) stages comprising the first two tiers of the model. The acronym ASDDURE stands for Analysis, Statement of Objectives, Design, Development, Utilization, Response, and Evaluation of the Mobile Application, which is how the researcher constructed these models to arrive at their conclusion. Writing instructional materials in line with the Basic Technology Curriculum was the first step in the process. The Basic Technology Learning Application (BTLA) was created by integrating educational materials into a mobile application that was already designed. According to recommendations from experts and relevance to the application's contents, the researcher and programmer sorted through the embedded photographs. Additionally, the creation of the mobile application involved two main stages.

Second research question: What impact does the created mobile application have on the knowledge of materials, processing, and workshop safety?

To examine how the developed mobile application affected the respondents' understanding of workshop safety, materials, and processing, a Basic Technology Performance Test was administered to them both before and after their exposure to it. The data were analyzed for frequency and percentage, and the students' overall academic performance was calculated using a benchmark set of ranges that represented fail, bad, fair, good, very good, and excellent: 0–39, 40–44, 45–49, 50–59, 60–69, and 70–100.

Table 1. Respondents' academic performance in basic technology when taught using the developed mobile application

S/N	Grading Value	Performance Level (%)	Pre-Test Frequency	%	Post-Test Frequency	%
1.	0-39	Fail	3	12.0	0	0
2.	40-44	Poor	4	16.0	0	0
3.	45-49	Fair	3	12.0	0	0
4.	50-59	Good	5	20.0	5	20.0
5.	60-69	Very Good	8	32.0	11	44.0
6.	70-100	Excellent	2	8.0	9	36.0

Average Performance	53.0	66.4
Score Range	Good	Very Good
Performance Difference	13.4%	

When taught with developed mobile technology, pupils' academic success in Basic technology is displayed in Table 7. According to the table, almost 40% of the students' pre-test scores were below 50%. However, in the administered post-test, none of them scored less than 50%. A similar percentage of pupils (20%) received performance grades ranging from 50% to 59%. Performance of 60% to 69% of the pupils showed a rise of up to 12%, while the exceptional performance grade showed an increase of roughly 28%. The pre-test and post-test results showed cumulative average performance of 53.0 and 66.4, respectively, showing a 13.4% performance difference. This suggests that the mobile application that was built to teach specific basic technology concepts had a beneficial impact on the academic achievement of students studying basic technology.

Research question three: How do educational technologists rank the produced mobile application for learning about materials, processing, and workshop safety?

Range was used to determine the overall rating of the developed mobile application to respond to the third research question. The data was analyzed simultaneously using simple and cumulative averages. A reference point with values of 0-35.9, 36-70.9, 71-105.9, and 106-140 was utilized to denote poor, good, very good, and exceptional performance, respectively. The results of the analysis are shown in Table 2 and are explained as follows:

Table 2. Educational technology experts' rating of the developed mobile application

S/N	Content Assessment	Average Score
1.	The content is reliable	4.33
2.	A balanced presentation of information	4.67
3.	Bias-free viewpoints and images	4.33
4.	Correct use of grammar	4.00
5.	Current and error-free information	4.00
6.	Concepts and vocabulary relevant to learners; abilities	4.00
7.	Information relevant to age group	4.00
Structure		
8.	The content is structured in a clear and understandable manner	4.67
9.	The structure of the app permits learners to advance, review, see examples, and repeat the unit or escape to explore another unit	4.67
Adaptivity		
10.	The package encourages discussion and collaboration among learners	4.33
11.	The app contains assignments that can be executed by a group of learners	3.67
12.	The app facilitates learning by doing	3.67
13.	The app promotes collaborative learning	3.67
Design Factor Interactivity		
14.	The interactivity of the app is based on the maturity of the students	4.00

S/N	Content Assessment	Average Score
15.	The app allows students to apply what they have learnt rather than memories it	4.33
16.	The package allows learners to discover information through active exploration	4.00
Screen Design		
17.	Screens are designed in a clear and understandable manner	4.33
18.	The presentation of information can captivate the attention of students	4.67
19.	The design does not overload students' memory	4.33
20.	The use of text follows the principles of readability	4.33
21.	The color of the text follows the principles of readability	4.33
22.	The number of colors on each screen is not more than six	4.00
23.	There is consistency in the functional use of colors	4.67
24.	The quality of the text is good	4.67
25.	Presented pictures are relevant to the information included in the text	4.67
26.	A high contrast between graphics and background is retained	4.33
27.	The integration of presentation means is well-coordinated	4.33
28.	The quality of the images and graphics is good	4.67
	Cumulative Score	119

The designed mobile app on workshop safety, materials, and processes received a validation rating of 8 out of 10 from Educational Technology Experts. The developed mobile app on workshop safety and materials and processing was rated excellent by Educational Technology Experts, as indicated by the cumulative score of 119 (85%), based on the range benchmark of 0-35.9, 36-70.9, 71-105.9, and 106-140, which represent poor, good, very good, and excellent, respectively.

Fourth research question: How does the created mobile application for learning about workshop safety, materials, and processing rate among instructional design experts?

In order to address research question four, range was utilized to ascertain the overall rating of the created mobile application, and simple and cumulative averages were employed to analyze the data. A reference range of 0–23.9, 24-48.9, 49–72.9, and 73–95 was utilized to indicate the categories of bad, good, very good, and excellent. The analysis's findings are displayed in Table 3 and can be understood as follows:

Table 3. Instructional system designers' rating of the developed mobile application

S/N	Technicality Assessment	Average Score
1.	Home key for returning to the main page	4.33
2.	Back key to get back to the previous page	4.33
3.	The next key to moving forward to the next page	4.33
4.	Exit key for exiting the program	4.00
5.	Screens are designed in a clear and understandable manner	4.00
6.	A balanced presentation of information	4.00
7.	Key for moving forward or backward in a lesson	3.67
8.	Key for accessing the next lesson in a sequence	3.33

S/N	Technicality Assessment	Average Score
9.	The package considers the individual differences of the learners	3.67
10.	The package considers the different learning styles and experience	4.00
11.	The package facilitates learning by doing	4.33
12.	The package promotes collaborative learning	3.33
13.	GIF images are purposeful, adding impact to the learning experience	4.33
14.	Digital effects are used appropriately for emphasis	4.00
15.	The mobile app has durability over time	4.33
	Quality of Instruction Assessment	
16.	Menu keys are well-positioned	3.67
17.	The app is presented in a logical order	4.0
18.	The app contains rich information to support learners' understanding	4.0
19.	The app enhances the presentation of the subject matter	4.0
	Cumulative Score	75.7

Table 3 shows the Instructional System Designer's validation grade for the mobile app that was created to teach workshop safety, materials, and processing. The developed mobile application on workshop safety and materials and processing was rated excellent by the Instructional System Designer, as indicated by the cumulative score of 75.7 (79.7%), based on the range benchmark of 0-23.9, 24-48.9, 49-72.9, and 73-95, which represent poor, good, very good, and excellent, respectively.

Research question five: How is the produced mobile application for learning about workshop safety, materials, and processes rated by basic technology teachers?

To address research question five, range was utilized to ascertain the overall rating of the created mobile application, and simple and cumulative averages were employed to analyze the data. To indicate bad, good, very good, and exceptional, a benchmark of 0-37.9, 38-75.9, 76-113.9, and 114-150 were used, respectively. The analysis's findings are displayed in Table 4 and can be understood as follows:

Table 4. Basic technology teachers' rating of the developed mobile application

S/N	**Content Assessment**	**Average Score**
1.	Objectives are clearly stated and relevant to the concept	4.67
2.	The contents of the mobile app match the objective	4.67
3.	Presentation leads to the acquisition of knowledge sought for	4.33
4.	Content is up-to-date and effective for learning	4.33
5.	Adequate and relevant content to the intended learning outcome	4.33
6.	Relevant to JSS curriculum needs	4.67
7.	The design of the mobile app is based on reliable learning and instructional theories and is directly related to the content of the curriculum	4.33
8.	The application of the mobile app is possible for various topics in the curriculum	4.33

S/N	Content Assessment	Average Score
9.	The application of the mobile app is possible on issues related to the curriculum	4.33
10.	The mobile app can be used by learners alone, without the need for other instructional objects (i.e. book)	4.33
11.	There is a balanced presentation of information	4.33
12.	The logical progression of basic technology workshop accidents and materials processing is guaranteed	4.67
13.	Concepts and vocabulary are relevant for learners	4.33
14.	The content is sufficient to achieve the stated objectives for the selected topics, workshop accidents, and materials processing	4.67
Technicality Assessment		
15.	The number of color on each screen is not more than four	4.5
16.	Screens are designed in a clear and understandable manner	4.33
17.	The images in the mobile app are clear enough	4.67
18.	The mobile app can be used on different Android smartphones	4.67
19.	The content of the mobile app caters for the three domains of learning	4.33
20.	The quality of the text is good	4.00
21.	The mobile app allows students to assess themselves in the course of the lessons	4.33
22.	The interactivity of the mobile app is in accordance with the level of students	4.33
23.	The mobile app affords an opportunity for interaction at every unit of the lesson	4.33
Design Assessment		
24.	The mobile app permits individual learners to learn at their own pace	4.00
25.	The presentation of information arrests the interest of learners	4.00
26.	Menu keys are well-positioned	4.33
27.	The mobile app is self-explanatory to achieve the stated objectives	4.33
28.	The mobile app facilitates learning by doing	4.67
29.	The organization of the instructional package permits learners to repeat the unit	4.67
30.	The organization of illustration and graphics are well presented	4.67
	Cumulative Score	**132.5**

The validation rating of the mobile app that Basic Technology teachers built to educate workshop safety, materials, and processes is shown in Table 4. The developed mobile app on workshop safety and materials and processing was rated excellent by Basic Technology Teachers, as indicated by the cumulative score of 132.5 (88.3%), based on the range benchmark of 0-37.9, 38-75.9, 76-113.9, and 114-150 to represent poor, good, very good, and excellent were employed, respectively.

An overview of the results

The following is an overview of the research questions and research hypotheses findings:

1. The academic performance of students studying Basic Technology was positively impacted by the mobile application that was built to teach workshop safety, materials, and processes.
2. Instructional system designers, basic technology teachers, and educational technology experts all gave the created mobile application on workshop safety, materials, and processing an outstanding rating.

Discussion

The project's goal was to create a mobile application that upper-basic schools in Nigeria could use to teach themselves some important technological topics. The creation and evaluation of a mobile application for teaching workshop safety, basic technological materials, and processing was the main objective of the project. The first study question describes the procedures for developing and evaluating a mobile application that uses the ASDDURE model to educate workshop safety, materials, and processing. The findings demonstrated that the app for learning basic technology had been developed effectively and would help students studying basic technology in Nigerian Upper Basic Schools. This supports Amosa's (2015) findings, who developed and evaluated an interactive video-based teaching package for basic technology education in Nigerian classrooms using pottery. The interactive video-based educational package enhanced students' academic achievement in basic technological ceramic instruction, according to the results.

The findings of Sowunmi and Aladejana (2023), who investigated the effects of computer-assisted instruction and simulation games on primary science performance in Lagos State, Nigeria, for effective teaching and learning, corroborate the findings of the current study. Their results demonstrated that these strategies improved the academic achievement of elementary science students. Once more, Hsu and Ching (2023) found that instructional packages give students the chance to participate in self-learning experiences, which significantly affects students' performances regardless of factors like gender or age. also support the results of this investigation. The deal was made because of the special features of mobile applications, which include personalized learning and offline functionality. Furthermore, Stoyanov, Hides, and Wilson (2016) found that mobile apps have aided in students' development, particularly in the area of online learning. It is therefore impossible to overstate how unique it is in that it can deliver curriculum materials regardless of time or distance.

Examining experts' evaluations of applications for basic technology learning was the goal. The third through fifth study questions concerned the evaluation of the mobile application in learning workshop safety and materials and processing in basic technology by educational technologists, instructional design specialists, and basic technology teachers using the ASDDURE model. Results indicated that a useful and practical mobile application might teach Nigerian upper basic schools about workshop safety, materials, and processes. especially in terms of structure, complexity, screen design, adaptability, and the caliber of instructional content. According to Falode et al.'s 2023 findings, there was a discernible shift in the kids' academic achievement following the program's use.

Three criteria are used to rate instructional content: linguistic correctness, information balance, and content reliability. Information clarity was established via the arrangement. In the meanwhile, adaptivity includes things like whether the mobile application promotes student participation and discussion as well as student-completed homework. The items related to screen design pertain to the application's ability to hold the interest of learners. These were all divided into individual items and evaluated by specialists in the fields of educational technology, computers, and subject matter, in that order. Every critique, correction, and observation was taken into account.

Conclusion

Using the ASDDURE approach, the study created a mobile application for Nigerian Upper Basic Schools to teach workshop safety, materials, and processing in basic technology. The findings demonstrated the efficacy of mobile applications as a tool for curriculum-based content learning. Therefore, instructional designers, educational technologists, and specialists in basic technology evaluated and determined that the areas of analysis of learners, objectives, contents, design, and development use were appropriate. One component of mobile learning that makes it simple to access instructional materials and learn at one's own pace and convenience is the mobile application. The academic performance of the learners had significantly changed as a result of using the mobile application. Nevertheless, after using the mobile learning application, there was no discernible difference between the attitudes and performance of male and female students.

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