CONTENT RATING OF WEB-BASED INSTRUCTIONAL PACKAGE

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Abstract
This research was conducted to investigate Content rating of Web-based Instructional Package (WEBIP). The study specifically assessed the procedures for developing the and the difference in the rating of WEBIP Contents by the groups of experts. Production-oriented type of descriptive research was adapted as the research design. The population consisted of Computer Science teachers, Programmers (Web developers), Educational Technology experts in Benin metropolis. The sample size consisted of 10 (Programmers in Benson Idahosa University and University of Benin) in Benin Metropolis. The instrument used by experts for validation of the package was the researcher- developed Visual Evaluation form (VEF). The data collected in this research work were analyzed using mean, standard deviation and Kendall's W^3 Mean Rank. The results revealed that experts scored the items in the contents of the package very high. This shows that there is a reasonable agreement among experts from University of Benin and experts in Benson Idahosa University. Experts from both institutions stated that hapters of the Programming Language sub-topics are arranged logically". The item "The fonts of the Programming Language topics are clear and visible" were ranked highest in the content of the package. In view of the findings, the researcher recommended that Computer Science Curriculum planners should modify the curriculum to ensure schools provide web-based instructional packages for learning programming languages and learners should be given the opportunity to explore instructional packages that can enhance their understanding of programming language.

Key: Web-based Learning, Online Learning. Digital Learning, Instructional Technology

Introduction

The discipline and professional category of instructional technology first emerged in the early 1960s. Since the early use of audiovisual technology, a wide range of varied technologies have been developed for educational purposes. Many people think that in order to leverage the special capabilities of new communication technology as a tool for learning about technology construction, invention, communication, and design, the educational system needs to be changed.

According to the Association for Educational Communications and Technology (AECT), which was established in 1994, Instructional Technology is the concept and practice of creating, developing, employing, controlling, and assessing processes and resources for learning. Formative testing is conducted at each level to ensure that the Instructional Package is successfully prepared.

According to Khan (1997), a web-based instructional package is an instructional programme that uses hypermedia and the resources of the World Wide Web or a web 2.0 platform to foster and support learning. In the context of this study, a brief discussion of the various stages in the development of a Web-based Instructional package will take place.

- ***Planning***: Infrastructure planning for the package takes into account the organization of the ideas and the final form the package will take. The package's goals, text format, physical appearance, and contents have all been carefully arranged. In order to ensure proper data collecting and package production, other related software or packages have to be consulted during the planning process.
- ***Design***: A prototype was created after careful planning and data gathering for the creation of the package (Paper sketch). Prior to the computer programmer (Developer) starting to code, all of the acquired data were cross-checked during this phase.
- Implementation: After the package is created, a formative assessment is conducted in the classroom.
- ***Evaluation***: The last round of testing happens at this stage. The package is examined to see if it satisfies the requirements and goals for which it was created.

Every child in Nigeria should be computer literate by the time they are in their senior year of high school because computer education is a subject that is mandatory in primary, junior, and senior secondary schools. In recent years, using technology for instruction has grown prevalent, particularly in Nigeria's higher

education institutions. Technology tool usage is still in its infancy. Their practical computer ability has a considerable impact on the overall success of students in external tests. The majority of educational institutions in Nigeria, especially those that are government-run, are believed not to be equipped with enough computers to teach computer science.

The National Educational Research and Curriculum Development (NERCD) has developed a new Universal Basic Education (UBE) curriculum that includes computer science instruction and distributed it to elementary, junior, and senior secondary schools. This is reflected in the nine-year Basic Science and Technology Curriculum (BSTC), which was modified in 2012.

Programming is sometimes referred to as coding. You can programme machines to perform your intended behaviours by providing them with a code, which is a set of comprehensive instructions. Thanks to coding, we can create websites, apps, games, and computer software. One who writes computer programmes is referred to as a programmer (Code). Students who use particular programming languages to develop code are better equipped to understand how and why particular computer programmes function.

Programming language software is necessary to write programmes in a language that a computer can understand. According to Hemmendinger (2018), programming language can be thought of as a set of directives that the machine will eventually be able to understand and implement. Programming language is one of the fundamental components of computer science. It is one of the essential subjects covered in secondary education. Students are mostly taught BASIC (Beginners' All-purpose Symbolic Instruction Code) programming at this grade level.

It is embarrassing to see secondary school graduates in the twenty-first century trying to use computers for the Unified Tertiary Matriculation Examination (UTME). When UTME candidates have finished secondary school, the Computer Based Testing System (CBT) offers a challenge because they are seen attempting to move the mouse pointer to answer questions in the testing environment. Secondary school graduates' enthusiasm in the topic wanes when they lack the essential computer skills required, which has a negative impact on their performance. It is thought that ineffective teaching brought on by a dearth of teaching resources may be the root of students' poor performance in computer science classes. If programming languages are properly taught at the fundamental level, students may get more interested in creating software and eventually decide to study computer science. The poll found that traditional teaching strategies are believed to be ineffective at arming students with the knowledge they need to prepare for a better future. Even if secondary school students are knowledgeable in computer science, they nevertheless find it difficult to create straightforward

programmes. Hence, the basis of this study is to Investigate the Contents of Web- based Instructional Package for teaching programming language in schools.

Research Questions

The following research questions were raised for the study:

(1) What are the procedures for developing a Web-based Instructional Package
(2) Is there any difference in the Content rating of WEBIP by groups of experts?

Hypothesis

The following hypothesis was tested at alpha level 0.05. Only research question two (2) was hypothesized.

1. There is no significant difference in the Content rating of WEBIP by groups of experts

This study's conceptual framework will be influenced by Said Hadjerrouit's Evolutionary Development Process Model (2006).

Evolutionary Process Model

An ideal process model for the creation of web-based instruction, according to Hadjerrouit (2006), would assist content creators, instructional designers, teachers, web developers, and administrators in addressing the complexity of web-based instruction, coping with evolution and change, and delivering the system as soon as possible. The evolutionary development process model appears to be adaptable enough to be applied to Web-based Instruction because it modifies an early prototype through consistent cycles of implementation, evaluation, and redesign until it meets all requirements. This is because Web-based Instruction is evolutionary in nature. Additionally, this model incorporates end-user and earlier development phases' feedback.

Over the previous five (5) years, students' performance on external exams in computer science has generally been mediocre (2013, 2014, 2015, 2016, 2017). According to the WAEC Chief Examiner's Report, there is evidence that pupils do modestly in computer science during external examinations (2013, 2014, 2015, 2016, 2017). According to the assessment, student performance in the computer theory component was on par with average, but bad in the computer application section (BASIC programming). Traditional evolutionary process models do have some drawbacks for Web-based Instruction systems, which are constantly changing, according to Hadjerrouit (2006). As a result, it would be challenging to predict when they will finish. The model must incorporate both basic pedagogy and learning evaluation in order to address the learning challenges unique to web- based instruction.

Definition of Web-based Instruction

The majority of Web-Based Instruction (WEBI) is computer-based teaching, and it typically makes use of a learning management system (LMS). Also known as e- instruction, web-based instruction, or just e-learning, according to Campbell, Hurley, Jones, & Stephens (1995).

Web-Instructional Package (WEBIP)

Powerful instructional delivery systems known as Web-Based Instructional Packages (WEBIP) are utilized in the classroom to explore, analyze, solve issues, engage with one another, and reflect on ideas and concepts in order to promote lifetime learning and sustainable development (Zemel, Xhafa & Stahl, 2015).

The real value of a web-based instructional package is not in enabling knowledge access for anyone, at any-time, anywhere, but rather in assisting students in acquiring the necessary knowledge and skills at the appropriate times so that they can participate as active, reflective, and collaborative members of the information-based society (Harasim, 2000).

Methodology

The production-oriented type of descriptive research is the one used in this study. It involved the design, creation, and evaluation of the researcher's Web-based Instructional Package. Teachers of computer science, programmers (web developers), and professionals in educational technology make up the majority of the population in Benin City. The study's specialists were used to create the sample size. Ten programmers from Benson Idahosa University and University of Benin in Benin Metropolis made up the sample size. Based on their expertise in programming and software development, the experts were chosen at random by the researcher using the simple random technique. The generated WEBIP was assessed by specialists using a Visual Evaluation Form (VEF).

Research Question 1: What are the procedures for developing the WEBIP?

PROCEDURES FOR PRODUCING (DEVELOPING) WEB-BASED INSTRUCTIONAL PACKAGE

The researcher and a programmer created the Web-based training package. The steps for creating the package from the researchers' area of contribution are listed below:

a. *Planning for the infrastructure of the package:*

It is taken into account how the concepts are organized and what form the product will take. The package's goals, text format, physical appearance, and contents have all been carefully arranged. In order to ensure proper data collecting and package production, other related software or packages have to be consulted

during the planning process. Testing was done towards the conclusion of the planning phase for the package's creation to ensure that all necessary pieces and parts were present. Menu, Multimedia Contents, Graphics for Programming Language, Examination Page, Test Page, Feedbacks, Attendance (Used when Internet is Available), Self-Study Page, E-book, Student Login and Register are some of the elements to consider during the planning phase.

b. Design Phase:

A prototype was created after data collection and planning for the development of the package (Paper sketch). Prior to the computer programmer (Developer) starting to code, all of the acquired data were cross-checked during this phase. Before moving on to the next step in the coding process, each phase is tested. The computer programmer created and coded the WEBIP using the various elements listed below. They consist of: Personal Home Page, XAMPP (cross-platform), Apache server, MariaDB, PHP, and Perl are all acronyms for PHP. Web 2.0 Platform, Sublime Text Editor, HTML (Hyper-Text Markup Language), CSS (Cascading Style Sheets), and Apache as the Local-Host Server are all examples of technologies.

c. Implementation: The package is introduced to the classroom for formative assessment after it has been created.

d. Evaluation: The last round of testing happens at this stage. The package is examined to see if it satisfies the requirements and goals for which it was created.

Expert Validation

Research Question 2: ***is there any difference in the rating of WEBIP Contents by the groups of experts?***

The answer to this research question is presented as follows,

Table 1: Mean Scores of the Contents of the WEBIP

INSTITUTION		N	Mean	Std. Deviation	Minimum	Maximum
UNIBEN	The Programming Language topics are well integrated in Package	5	3.00	.707	2	4
	The text fonts of the Programming Language topics are Clear and Visible	5	4.00	1.000	3	5

	The topics are well broken down into sub-topics for easy understanding.	5	1.80	.837	1	3
	Chapters of the Programming Language sub-topics are arranged logically	5	3.80	.837	3	5
	Visual Basic as one of the Programming Language is well broken in the package	5	3.60	1.342	2	5
BIU	The Programming Language topics are well integrated in Package	5	3.60	.894	3	5
	The text fonts of the Programming Language topics are Clear and Visible	5	4.80	.447	4	5
	The topics are well broken down into sub-topics for easy understanding.	5	3.20	1.095	2	4
	Chapters of the Programming Language sub-topics are arranged logically	5	4.00	1.414	2	5
	Visual Basic as one of the Programming Language is well broken in the package	5	1.60	.894	1	3

The bulk of the mean scores, as displayed in table 1, received high ratings from the experts from both institutions. The comments "The themes are well broken down into sub-topics for simple understanding" and "Visual Basic as one of the Programming Language is well broken in the package" had low mean scores in the table.

Table 2: Kendall's W^3 Mean Rank of the Contents of the WEBIP

INSTITUTION		MEAN RANK
UNIBEN	The Programming Language topics are well integrated in Package	2.70
	The text fonts of the Programming Language topics are Clear and Visible	3.80
	The topics are well broken down into sub-topics for easy understanding.	1.10
	Chapters of the Programming Language sub-topics are arranged logically	3.90
	Visual Basic as one of the Programming Language is well broken in the package	3.50
BIU	The Programming Language topics are well integrated in Package	3.00
	The text fonts of the Programming Language topics are Clear and Visible	4.50
	The topics are well broken down into sub-topics for easy understanding.	2.80
	Chapters of the Programming Language sub-topics are arranged logically	3.40
	Visual Basic as one of the Programming Language is well broken in the package	1.30

Table 2 shows that experts from Benson Idahosa University ranked the item "The text fonts of the Programming Language topics are Clear and Visible" as having the highest mean rank of 4.50 in the package's contents. This rating was higher than that of experts from the University of Benin, who ranked the same item at
3.80. With a mean rank of 3.90, experts at the University of Benin gave the statement "Chapters of the Programming Language sub-topics are structured logically" the third-highest rating, while experts at Benson Idahosa University gave it a mean ranking of 3.40. The University of Benin's specialists gave the item "Visual Basic as one of the Programming Language is well broken in the package" a mean rating of 3.50, which put it fourth in the ranking table. Experts from Benson Idahosa University gave the item a higher grade than experts from the University of Benin, who graded it with a mean rank of 2.70. They believe that the programming language themes are appropriately integrated into the package. The statements "The topics are well broken down into sub-topics for easy understanding" and "Visual Basic as one of the Programming Language is well broken in the package" received low ratings in the ranking table from the

experts from University of Benin and Benson Idahosa University, with mean ranks of 1.10 and 1.30, respectively.

HYPOTHESIS TESTING

Hypothesis 1: ***There will be no significant difference in the Content rating of WEBIP by groups of experts***

The hypothesis was tested using Kendall's Coefficient of Concordance. The result is presented as follows;

Table 3: Kendall's W Test Statistics of the Contents of the WEBIP

Uniben	N	5
	Kendall's W[a]	.643
	Chi-Square	12.857
	Df	4
	Asymp. Sig.	.012
BIU	N	5
	Kendall's W[a]	.607
	Chi-Square	12.136
	Df	4
	Asymp. Sig.	.016

Benson Idahosa University is ranked highly among experts, as shown in Table 3, where the Kendall W value of 0.61 is not statistically significant at an alpha level of 0.05. (level of significance is 0.016). The University of Benin receives great grades from the experts as well because of its Kendall W value of 0.64, which is also negligible at an alpha level of 0.05. (level of significance is 0.012). This demonstrates that there is broad agreement among the experts from the two institutions over how to evaluate the WEBIP's contents.

Findings

The WEBIP's content is scored first in terms of "chapters of the Programming Language sub-topics are arranged logically" and "the fonts of the Programming Language subjects are clear and apparent," according to specialists from both schools (University of Benin and Benson Idahosa University).

Conclusions

The following conclusions were reached in light of the study's findings:

The development of a web-based educational programme will enhance knowledge of challenging computer science topics, notably programming language. According to experts from the institutions understudied who assessed the specialized package, a web-based educational package will help engage the

students in active involvement and provide an environment that will enable slow learners to catch up more rapidly in the classroom. The aim item "Learners will be able to write short codes" was evaluated by specialists at the University of Benin, who concluded that there is also a strong likelihood that students will develop an interest in creating simple programmes. The Web-based Instructional package, however, meets with the standards for software development, and that much is apparent.

Recommendations

The researcher offered the following recommendations:

1. The course offers for universities' online programming language courses should be changed by curriculum designers for computer science.
2. Since computer science is a prerequisite for institutions at the primary, secondary, and tertiary levels, students should be instructed using the essential instructional programmes to ensure that they thoroughly comprehend programming language.
3. Students should have the opportunity to research teaching resources that could help them understand programming language better. In other words, rather than being limited to classroom theories when being taught, students should have the choice to actively participate in the learning process with the use of a well-designed web-based educational package.
4. When creating a good web-based teaching package, software experts should be consulted to minimize the challenges students face when learning how to design a simple programme.

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