

Development of Android-Mobile Application Software in Teaching Web System and Technologies

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Abstract

Background/Objectives: The major concern of the study was to develop android - mobile application software for teaching web systems and technologies for the Bachelor of Science in Information Technology students of the College of Information & Communications Technology of Bulacan State University. **Methods/Statistical analysis:** It made use Instructional System Design (ISD) model, which consists of five phases: (1) analysis; (2) design; (3) development; (4) implementation; and (5) evaluation and revision. The topics included in the courseware were based on the scope of the course syllabus of IT393 - Web Systems and Technologies, enabling the students to learn principles of the subject in unique approach with seven conceptualized units. Significantly, **Findings:** the AMAS has the following advantages: (1) Learner Control; (2) Motivation; (3) Increased interaction; (4) Individualization; (5) Lesson Integrity; (6) Immediate feedback; and (7) Ease of record keeping. **Improvements/Applications:** Its acceptability was assessed in five dimensions: (1) subject matter content; (2) Readability; (3) Instructional design; (4) Software Operation; and (5) Usability. Moreover, considering the advantages of the software and the acceptability of the android - mobile application software approach, it was recommended that this new mode of instruction be implemented in teaching web systems and technologies.

Index Terms

Android – Mobile Application Software, Instructional System Design, Web Systems and Technologies.

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I. INTRODUCTION

The development and improvements of Information and Communication Technologies (ICTs) have changed the way teaching, and learning process is being conducted. ICTs help immediate access information resources needed for teaching and learning. In both schools and homes, information and communication technologies (ICT) are commonly seen as enhancing learning, fueling their fast diffusion and acceptance throughout developed societies [1].

Information and Communication Technologies (ICTs) applications enhance an exchange of information between learner-tutor and learner-learner. These tools include computers, radio, television, mobile phones, and some other devices. These tools provide a suitable platform for the teaching-learning process.

Among the ICTs tools, the mostly owned and used among people are the mobile phones. The world is contracting with the evolution of cellular phone technology. As the number of users is growing day by day, facilities are also growing. Starting with simple regular handsets which were used just by making phone calls, mobiles have changed our lives and have become part of it. Nowadays, they are not used just for making calls, but they have numerous users and can be used as camera, music player, tablet pc, T.V., web browser, etc. Through these new technologies, new software and operating systems are required. These tools can provide appropriate learning platforms as they have many of applications that tutors and learners may use in their academic activities. Mobile devices with cellular connectivity advance learning and engage students and teachers. Wireless technology is a way to make available new content and facilitate information access wherever the location of the students. It enables, empowers, and engages learning in ways that alter the learning environment for students inside and outside of school [2].

Mobile phones are becoming popular as many people can afford them. Presently, the use of mobile communication devices has vanished beyond the traditional communication role that is now used in supporting teaching and learning. Mobile learning applications can enable students not only in learning contents conveniently but also in interacting with others collaboratively anytime and anywhere. Therefore, the growth of m-learning as a new scheme for education has implications for the way students and tutors in educational institutions interact [3].

Web System and Technologies is one of the major subjects of BSIT students at the College of Information & Communications Technology of Bulacan State University. Traditionally, the teachers present their lesson in which they follow the proper

sequence of presenting different parts of the lesson. Also in the traditional way, the teacher is prone to missing a certain part of the topic that is previously discussed to other classes when they meets the next set of students. Likewise, the teacher's manner of delivering the lesson differs from one class to another. The quality of instruction is what the teachers always want to achieve every time they execute the lesson. Quality education is at risk if the student never completes and understands the lesson. The subject calls for the intensive and comprehensive way of presenting the lessons through advanced technology.

Like other subjects, students perceive that Web System and Technologies are difficult. Some of them were having a hard time with problem analysis, web design, and development. The presence of advanced technology like the use of Android-Mobile Application Software is considered possible and a better solution to some aspects of the problems.

A. Statement of the Problem

The major concern of the study was to develop Android-Mobile Application Software in Teaching Web System and Technologies for the BSIT students of the College of Information & Communications Technology at Bulacan State University.

Specifically, this study sought answers to the following questions:

1. What are the advantages of using Android-Mobile Application Software in teaching Web System and Technologies?
2. What are the different factors to be considered in creating Android-Mobile Application Software?
3. What are the steps in constructing Android-Mobile Application Software?
4. What are the topics to be included in Android-Mobile Application Software?
5. How acceptable is Android-Mobile Application Software regarding the following.
 - a. Subject Matter Content
 - b. Readability
 - c. Instructional Design
 - d. Software Operation
 - e. Usability

B. Significance of the Study

The result of the study herein contained can provide vital information concerning how the new software application contributes to computer education. Likewise, it will give a clear cut view of how the new software application can be used to enhance further the teaching of web systems and technologies.

However, as in all undertaken, there are clear beneficiaries for the results of this study.

Students. The output of this study is expected to

help the BSIT students in teaching and learning Web System and Technologies. It will also be a great help in the improvement of the learning process of the students. The study can be an additional reference material for other colleges/students taking Web System and Technologies.

Faculty. The positive result from this study can contribute to the computer education using Android-Mobile Application to boost the student interest and motivation in the classroom through a greater diversity of learning goals, projects, and outcomes. The successful CAI software combines information technology with appropriate pedagogy. The knowledge of educators is broadened to include collaborative learning. Educators can use computer-assisted instructional software as driving element of an educational reform.

Researcher. The acceptability of the Android-Mobile Application Software in teaching is expected to contribute in the field of educational research in improving student's achievement in learning Web System and Technologies.

School Administrators. Likewise, the outcome of this study is expected to encourage school administrators and faculty members in using the Android-Mobile Application Software as an alternative approach, which may be used in combination with the traditional learning, depending on the resources of the school.

Lastly, the study could serve as guide for future researcher in conducting the same research and developing an Android-Mobile Application Software.

C. Scope and Delimitation

The Android-Mobile Application Software for Teaching Web Systems and Technologies was designed for BSIT Students of the College of Information & Communications Technology of Bulacan State University. The course content of the Android-Mobile Application Software was based on the currently implemented course syllabus in the Bulacan State University.

The study covered topics in Web Systems and Technologies. The software is user-friendly because it can provides options for the user to navigate and explore the software on their own. It provides an evaluation at the end of each lesson to measure the learning ability of the learner that enables them to proceed to the next lesson if they are able and ready to pass the given evaluation. The quiz result of the student will automatically sent to the teacher's Gmail account. The Android-Mobile Application Software was uploaded, and it can be downloaded through Google play store. The AMAS runs on the Kitkat Android Operating system and higher Android Operating System.

The researcher focused on the development of the

Android-Mobile Application Software using Instructional System Design (ISD) Model which consists of the following five phases: (1) analysis; (2) design; (3) development; (4) implementation; and (5) evaluation and revision.

The acceptability of the Android-Mobile Application Software as an instructional tool was evaluated using the following criteria: (1) subject matter content; (2) readability; (3) instructional design, (4) software operation, and (5) usability.

II. RESEARCH MODEL

The study utilized the descriptive research method in developing Android-Mobile Application Software in Teaching Web Systems and Technologies. The focus on the procedures and processes involved analysis, development, and evaluation of the Android-Mobile Application Software. The topics to be considered in the development of Android-Mobile Application Software were based on the BSIT Students course syllabus for Web System and Technologies subject.

The descriptive methods of research describe the characteristics of a phenomenon, as it exists. Descriptive research contributes much to the establishment of standard norms of conduct, behavior or performance, generalizations of principles. It is very useful for investigating a variety of educational problems.

The research method used by the researcher is descriptive development (R & D) method of research. It is a process used to develop and validate educational products. Steps involved in this method include the following: (1) studying research findings pertinent to the products; (2) developing the product based on the findings, (3) field testing of the product, and (4) revising the product.

A. Conceptual Framework

The study utilized the conceptual paradigm presented in figure 1.

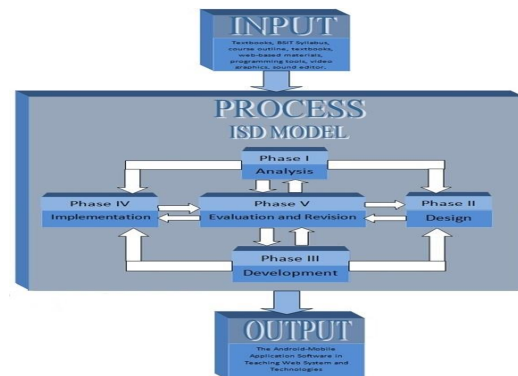


Fig. 1. Input Process Output Model

In designing and evaluating the acceptability of the Android-Mobile Application Software, the

researcher adopted the IPO model, which stands for Input, Process, and Output.

The inputs necessary for the development of the Android-Mobile Application Software in teaching Web System and Technologies are the course syllabus, textbooks, reference materials, web-based materials, programming tools, video and graphics editing tools, sound recorded/editor and computer peripheral/devices. The researcher used the course syllabus of the BSIT students of the College of Information & Communications Technology of Bulacan State University as the main source of the data and information for the lessons to be incorporated in the development of the Android-Mobile Application Software. Topics and relevant information were accepted agreeing to each sequence using textbooks and available references. The textbooks were developed to meet the objectives and sequencing of the topics.

The process by which the software is established was carefully documented. This settlements of systematic steps and procedures observed in planning, developing, and evaluating the acceptability of the Android-Mobile Application in teaching Web System and Technologies for the BSIT students of the College of Information & Communications Technology of Bulacan State University. Even though IPO was used, the Android-Mobile Application Software was developed using the Instructional System Design (ISD) Model. The ISD Model consists of five phases: (1) analysis; (2) design; (3) development; (4) implementation; (5) evaluation and revision.

The output referred to in this study is the Android-Mobile Application Software in Teaching Web System and Technologies.

B. Android – Mobile Application Software Development Process

The Android-Mobile Application Software in Teaching Web System and Technologies is developed using the Instructional System Design (ISD) Model as shown in the figure 2, which include the following five phase; (1) analysis phase; (2) design phase; (3) development phase; (4) implementation phase; and (5) evaluation and revision.

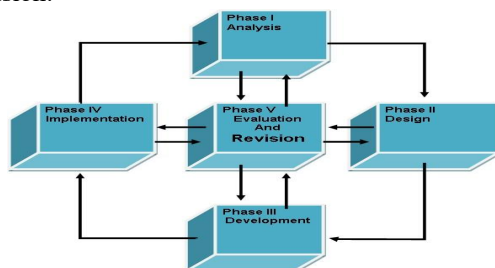


Fig. 2. Android – Mobile Application Software Design (ISD) Model

Phase I - Analysis. The analysis phase is the first of any instructional design project. This step is very important in every software development. The goal of this is to define clearly the requirements of the project. It is a detailed requirement analysis which produces a user-oriented description particularly the specification of the software, which includes identification for whom the software is to be developed, the environment in which it was used, the constraints which it was developed, instructional goals and objectives and the assessment that were used.

A thorough analysis of the problem requirements and careful understanding of the goals and objectives were carried out by the researchers in this phase. The topics to be included were logically organized according to the course syllabus and needs of the target clientele. Once an understanding of skills and knowledge required has been gained, the decision of what must be included in the lesson comes next. The researcher aims to implement the top-down approach wherein the problem was analyzed from the major problem to specific ones. Top-down designs breakdown the unique set of program specifications into smaller, more adaptable sections.

Moreover, the researcher collect, diagnose and analyze the problem and conducted the study to assess the overall requirements needed in the development of the Android-Mobile Application Software. The first step in the construction of the software is to understand the course content of the subject to be developed and the target clientele.

The researcher used the course syllabus of the BSIT students of the College of Information & Communications Technology of Bulacan State University as the main source of the data and information for the lessons to be encompassed in the development of the Android-Mobile Application Software. The syllabus in Web System and Technologies, as the other references helped in analyzing a possible content of the program.

Phase II - The Design Process. In the design process, the primary objective is to identify user requirements and to build a system that satisfies these requirements. The purpose of the system design is to create a blueprint for a new system that satisfies all documented requirements, whether the system is being developed in-house or purchased a package. During systems design, all necessary inputs, interface, processes and output are identified. It is the systematic and specific process of identifying the set of strategies aimed at attaining a particular goal containing elements attaining to precise details [4].

The researcher used the two sub-phases in designing the Android-Mobile Application Software: preliminary design, and detailed design. Preliminary design often involves alternative plans and often makes use of the device such as prototyping. In

detail design, every facet of the system is considered in detail. Normally, the following parts of the system are considered: input requirements, files and databases, system processing, system controls, backup and output requirements. These interfaces define exactly what the users is expected to do in using the system.

Phase III - The Development Process. This phase elaborates and builds on the learning objectives that were produced in the design phase. It is a process of programs and hardware requirements depending on the instructional software to be produced. Development is simply diagramming or outlining the necessary activities that assist the learners in reaching the course goals.

Phase IV - The Implementation Process. It is the process of putting the software into operation. It involves testing to verify that the software works properly. After the program has been developed, it must be tested thoroughly. Testing refers to the evaluation of program execution, not the ability to produces desired learning outcome.

The researcher conducted testing activities to the students who are enrolled in the subject, to make sure that the Android-Mobile Application Software was accurately translated into operating procedures, and then to rectify any flaws in the solutions that was then uncovered.

Phase V - Evaluation and Revision. It is the systematic process that determines the quality of the final product. It is an on-going activity conducted at such phase of ISD model. It is used to determine whether the objectives have been met and to identify those parts where modifications are required. The last phase requires that the new system developed, and the existing system is tested in parallel to determine the weakness for modification. The evaluation was done throughout the entire instructional design stage and even after implementation to identify the areas that still need revision.

III. RESEARCH RESULTS

The researcher used validated questionnaire distributed to the faculty members teaching the course and students were asked to evaluate the courseware to determine the acceptability of the Android-Mobile Application Software in Teaching Web System and Technologies. Five important points need to be considered; namely (1) subject matter content; (2) Readability; (3) Instructional design; (4) Software Operation; and (5) Usability.

The data analysis was generally descriptive and quantitative. For the results presentation, analysis and interpretation of data, the following statistical tools were utilized: (1) frequency and percentage distribution in describing the classification of the

respondents; and (2) weighted mean in determining the level of the system's acceptability concerning the different system criteria. To facilitate the interpretation of the weight mean score of the responses, the upper and the lower limit of scale was adopted using the 5-point Likert Scale as shown below:

| NUMERICAL RATING | DESCRIPTIVE INTERPRETATION |
|------------------|----------------------------|
| 5.00 | Very Good |
| 4.00 | Good |
| 3.00 | Fair |
| 2.00 | Poor |
| 1.00 | Very Poor |

Ten (10) IT experts and programmers were also asked to evaluate the developed software. Total number of respondents and evaluators are presented in Table 1.

Table 1. RESPONDENTS AND EVALUATORS OF THE STUDY

| Evaluators | Frequency (N) | Percentage (%) |
|----------------------------|---------------|----------------|
| Faculty Members | 10 | 20% |
| Students | 30 | 60% |
| IT Experts and Programmers | 10 | 20% |
| Total | 50 | 100% |

The acceptability of the Android - Mobile Application Software was examined in terms of file criteria: subject matter content, readability, instructional design, software operation and usability. The examination was done through the pooled judgment of different competent persons in the field of computer; (1) faculty members handling & teaching Web System and Technologies at the Bulacan State University, (2) IT experts, programmers & professional software developer from the Arch Global Services Inc., Eton Centris, Quezon City; and (3) system analyst at the College of Our Lady of Mercy.

Using a locally structured evaluation instrument, the evaluations of the experts on twenty-three indicators were obtained using a five-point Likert Scale interpreted as follows: 5 - "very good"; 4 - "good"; 3 - "fair"; 2 - "poor"; 1 - "very poor." The weighted mean of the evaluation was later computed and are presented in Table 1.

Regarding subject matter content, of the Android - Mobile Application Software was rated "very good" in the content of each lesson containing values for the attainment of the instructional goals (4.60) and in the required learning proficiencies prescribed for the course (4.80). A "very good" rating, however, was given to the indicator on the organization of the information presented (4.60); it uses concepts and

information that are universal and lasting rather than transitory (4.60), and the program materials provide an interaction which increases its instructional value (4.80).

In terms of readability of the software, the evaluator rated the software (4.80) because the sentence and vocabulary are suited to the comprehension level of the learner; the graphics and animations serve as clear purpose and appropriate for intended user (4.80); the text is free of free and grammatical errors (4.60); the screen designs are well balanced and free of unnecessary clutter and text; and it uses a comfortable text size for scanning and reading (4.60).

The instructional design was rated “very good” with a mean of 4.65 in terms of the following indicators: the presentation of learning activities facilitates the achievement of objectives (4.60); there is a congruence between the objectives and teaching methods, activities and content (4.80); the content of each lesson is arranged from simple to complex, observable to abstract (4.60); and includes motivation such as graphics, color and animation.

The data gathered from the evaluations of the experts of its software operation portray a rating of “very good”. This was based on the following indicators: the program is easy to install and operate (4.60); the program is free of bugs and breaks (4.60); the user has control over its operation (4.80); on-screen help is always available for the user so as not to get lost or confused (4.60); and the software is machine independent (4.60).

One of the elements of a software is its usability, that is interactivity is present during the learning process (4.60); the software is user-friendly (4.80); the links provided to other pages/screen operate efficiently enough to keep user on task (4.60); and the software executes as what it is intended to do with no awkward time (5.00)

The Android - Mobile Application Software in teaching Web Systems and Technologies as a whole was found acceptable as shown by the grand mean of 4.68 and was strongly recommended for adoption for further improvement of the software. The following suggestions/comments were given by the experts:

1. Additional user tips/shortcut keys to be more users friendly.

2. Give emphasis on external motivators such as graphics, colors, to make the lessons more interesting to the users.

After carefully considering the recommendations, the Android - Mobile Application Software was put into its final form.

Table 2. LEVEL OF ACCEPTABILITY OF THE DEVELOPED SYSTEM

| Dimension | Evaluations | | | | | | |
|--|----------------|-----------|-----------|-----------|----------------|------|----------------|
| | Very Good 5 | Good 4 | Fair 3 | Poor 2 | Very Poor 1 | Mean | Interpretation |
| Subject Matter Content | | | | | | | |
| 1. The content of each lesson contains values for the attainment of the instructional goals. | 3 (15) | 2 (8) | | | | 4.60 | Very Good |
| 2. The contents cover the required learning proficiencies prescribed for the course. | 4 (20) | 1 (4) | | | | 4.80 | Very Good |
| 3. The information presented are organized and easily understood by the user. | 3 (15) | 2 (8) | | | | 4.60 | Very Good |
| 4. It uses concepts and information that are universal and lasting rather than transitory. | 3 (15) | 2 (8) | | | | 4.60 | Very Good |
| 5. The programmed materials provide an interaction which increases its instructional value. | 4 (20) | 1 (4) | | | | 4.80 | Very Good |
| Readability | | | | | | | |
| 1. The sentence and vocabulary are suited to the comprehension level of the learner. | 4 (20) | 1 (4) | | | | 4.80 | Very Good |
| 2. The graphics and animations serve a clear purpose and appropriate for the intended user. | 4 (20) | 1 (4) | | | | 4.80 | Very Good |
| 3. The text is free of free and grammatical errors. | 3 (15) | 2 (8) | | | | 4.60 | Very Good |
| 4. The screen designs are well balanced and free of unnecessary clutter and text. | 3 (15) | 2 (8) | | | | 4.60 | Very Good |
| 5. It uses a comfortable text size for scanning and reading. | 3 (15) | 2 (8) | | | | 4.60 | Very Good |
| Instructional Design | | | | | | | |
| 1. The presentation of learning activities facilitates the achievement of objectives. | 3 (15) | 2 (8) | | | | 4.60 | Very Good |
| 2. There is congruence between the objectives and teaching methods, activities and content. | 4 (20) | 1 (4) | | | | 4.80 | Very Good |
| 3. The content of each lesson is arranged from simple to complex, observable to abstract. | 3 (15) | 2 (8) | | | | 4.60 | Very Good |
| 4. It includes motivation such as graphics, color, and animation. | 3 (15) | 2 (8) | | | | 4.60 | Very Good |
| Software Operation | | | | | | | |
| 1. The program is easy to install and operate. | 3 (15) | 2 (8) | | | | 4.60 | Very Good |
| 2. The program is free of bugs and breaks. | 3 (15) | 2 (8) | | | | 4.60 | Very Good |

| | | | | | | | |
|--|-------------|--|--|--|--|-------------|------------------|
| 3. The user has control over its operation. | 4 (20) | 1 (4) | | | | 4.80 | Very Good |
| 4. On-screen help is always available for the user so as not to get lost or confused. | 3 (15) | 2 (8) | | | | 4.60 | Very Good |
| 5. The software in machine independent. | 3 (15) | 2 (8) | | | | 4.60 | Very Good |
| Usability | | | | | | | |
| 1. Interactivity is present during the learning process. | 3 (15) | 2 (8) | | | | 4.60 | Very Good |
| 2. The software is user-friendly. | 4 (20) | 1 (4) | | | | 4.80 | Very Good |
| 3. The links provided to other pages/screen operate efficiently enough to keep the user on task. | 3 (15) | 2 (8) | | | | 4.60 | Very Good |
| 4. The software executes as what it is intended to do with no awkward time. | 5 (25) | | | | | 5.00 | Very Good |
| Grand Mean | | | | | | 4.68 | Very Good |
| Comments | Evaluator 1 | Additional user tips/shortcut keys to be more user-friendly. | | | | | |
| | Evaluator 2 | Give emphasis in external motivators such as graphics, colors to make the lessons more interesting to the users. | | | | | |
| | Evaluator 3 | None. | | | | | |
| | Evaluator 4 | None. | | | | | |
| | Evaluator 5 | None. | | | | | |
| Recommendations | Evaluator 1 | The software is acceptable. I recommend the Adoption. | | | | | |
| | Evaluator 2 | The software is acceptable. I recommend the Adoption. | | | | | |
| | Evaluator 3 | The software is acceptable. I recommend the Adoption. | | | | | |
| | Evaluator 4 | The software is acceptable. I recommend the Adoption. | | | | | |
| | Evaluator 5 | The software is acceptable. I recommend the Adoption. | | | | | |

Very Good (5.00); Good (4.00); Fair (3.00);
Poor (2.00); Very Poor (1.00)

The main concern of the study was to design and develop Android - Mobile Application Software in teaching Web Systems and Technologies for the Bachelor of Science in Information Technology students of the College of Information & Communications Technology of Bulacan State University.

The study believes that Android - Mobile Application Software can contribute in enhancing the level of the learning process of the students that produces an effective and efficient way of presenting the subject. The subjects call for the intensive and comprehensive way of presenting the lessons through advanced technology. The integration of sound, colorful text, graphics and animation motivate the students in learning web system and technologies.

The study utilized the developmental method of research in developing Android - Mobile Application Software in teaching Web Systems and Technologies. The focus was on the procedures and processes involved in the development and evaluation of the application software. Documentary analysis was used in obtaining the data requirements needed in the study. The following information was used

extensively in data gathering: (1) checklist of BS Information Technology, (2) Web Systems and Technology syllabus, and (3) BS Information Technology, Mission, Vision, and Goals. All the learning materials have been prepared before the software development. The software was evaluated using 5-point Likert scale.

Using the preceding procedures, the study can be summarized as follows:

Problem 1 - What are the advantages of using Android - Mobile Application Software in teaching Web Systems and Technologies? CAI software has its advantages in teaching web system and technologies when compared to the traditional approach of learning. The advantages are as follows: (1) Increased Interaction; (2) Individualization; (3) Motivation; (4) Lesson Integrity; (5) Learner Control; (6) Immediate Feedback; and (7) Ease of Record Keeping.

Problem 2 - What are the different factors to be considered in creating Android - Mobile Application Software? The Android - Mobile Application Software considered the following factors in designing and developing the courseware: (1) gaining attention, (2) presenting objectives, (3) recalling prerequisites skills, (4) presenting stimuli, (5) providing guidance, (6) eliciting performance, (7) providing feedback; (8) assessing performance; and (9) facilitating retention and transfer.

Problem 3 - What are the steps in constructing Android - Mobile Application Software? The development of the Android - Mobile Application Software utilized the Instructional System Design (ISD) model. The ISD model consists of five phases. (1) Analysis phase; (2) design phase; (3) development phase; (4) implementation phase; and (5) evaluation and revision phase.

Problem 4 - What are the topics to be included in Android - Mobile Application Software? Based on the scope of course syllabus of Web System and Technologies, seven lessons constitute the development of Android - Mobile Application Software in teaching Web Systems and Technologies for Bachelor of Science in Information Technology, as follows:

Part I

Lesson 1 1. Introduction to HTML

- 1.1 Definition of HTML
- 1.2 Features of HTML
- 1.3 HTML Page Structure
- 1.4 Purposes of Web Browsers
- 1.5 Doctype Declarations
- 1.6 HTML Versions
- 1.7 How to write HTML using Notepad or Text Edit

Lesson 2 2. What is HTML documents?

- 2.1 HTML paragraphs

| | |
|-------------------|--|
| 2.2 HTML links | |
| 2.3 HTML images | |
| 2.4 HTML elements | |
| Lesson 3 | 3. HTML Tags and Attributes |
| 3.1 | Lang attributes |
| 3.2 | Title attributes |
| 3.3 | Size attributes |
| 3.4 | HTML background color |
| 3.5 | HTML text color and font size |
| 3.5.1 | HTML text size |
| 3.5.2 | HTML text alignment |
| 3.6 | HTML formatting elements |
| 3.6.1 | Using italics and emphasized |
| 3.6.2 | Using formatting |
| 3.6.3 | Using deleted and inserted |
| 3.6.4 | Using sub. and superscripted |
| Lesson 4 | 4. HTML Elements |
| 4.1 | HTML colors |
| 4.1.1 | RGB colors |
| 4.1.2 | Hexadecimal colors |
| 4.1.3 | Color names |
| 4.2 | What is <p> element? |
| 4.3 | HTML line break |
| 4.4 | What is <pre> element? |
| 4.5 | Defining HTML tables |
| Lesson 5 | 5. Type of Input Element |
| 5.1 | Text input |
| 5.2 | Radio button |
| 5.3 | Submit button |
| 5.4 | The action and name attribute |
| 5.5 | Using different types of elements |
| 5.5.1 | The text area element |
| 5.5.2 | The button element |
| 5.5.3 | The datalist element |
| 5.5.4 | The keygen element |
| 5.5.5 | The input element |
| Lesson 6 | 6. HTML fields |
| 6.1 | What is the diff. field's use in HTML? |
| 6.1.1 | Input and password field |
| 6.1.2 | Submit and radio button field |
| 6.1.3 | Button and number field |
| 6.1.4 | Date and color field |
| 6.1.5 | Week, time, date time and email |
| Lesson 7 | 7. HTML example Attribute |
| 7.1 | Value attribute |
| 7.2 | Read-only attribute |
| 7.3 | Disabled attribute |
| 7.4 | Size and max length attribute |
| 7.5 | Non-validated and autofocus attribute |
| 7.6 | HTML for attribute |

Part II Development and presentation of the developed system design (15 hours will be allotted for this part of the course)

Problem 5 - How acceptable is Android - Mobile Application Software? The acceptability of the Android - Mobile Application Software was

evaluated using the following criteria: (1) subject matter content, (2) readability, (3) instructional design, (4) software operation, and (5) usability. The acceptability of the android - mobile application software in teaching web systems and technologies was assessed in five dimensions:

| Dimension | Assessment |
|----------------------------|------------|
| a.) Subject matter content | Good |
| b.) Instructional design | Very Good |
| c.) Readability | Good |
| d.) Usability | Very Good |
| e.) Portability | Very Good |

IV. CONCLUSION

A conclusion Based on the finding of the study, the following conclusions were drawn:

1. The Android - Mobile Application Software has different advantages that improve the methodology in delivering instruction. AMAS software has its advantages in teaching Web Systems and Technologies when associated to the traditional approach of learning. The advantages are as follows: (1) Increased Interaction; (2) Individualization; (3) Motivation; (4) Lesson Integrity; (5) Learner Control; (6) Immediate Feedback; and (7) Ease of Record Keeping.

2. All areas listed in Web Systems and Technologies can be programmed by the Android - Mobile Application Software.

3. Android - mobile application software is acceptable software in teaching web system and technologies subject.

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