MODELLING, DESIGN AND IMPLEMENTATION OF A WEB-BASED PERSONALISED E-LEARNING SYSTEM

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DECLARATION

I declare that the work in this thesis entitled 'Modeling, Design And Implementation Of A Web-Based Personalised E-Learning System' has been performed by me in the Department of Mathematics under the supervision of Dr O.S Adewale.

The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at any university.

AMAH, Mathew Ngozi

| --- | --- | --- |
| Name of student | Signature | Date |

CERTIFICATION

This thesis entitled 'MODELLING, DESIGN AND IMPLEMENTATION OF A WEB-BASED PERSONALISED E-LEARNING SYSTEM' by AMAH, Mathew Ngozi meets the regulations governing the award of the degree of master of science in Computer Science, Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This work is dedicated to my lovely wife and children – Mrs. Chidimma Lawretha Amah, Michael Ugochukwu Amah, and Emmanuel Yagazie Amah.

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I am most grateful to God Almighty for His guidance and abundant provisions in material and health.

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ABSTRACT

This thesis presents a formal description of personalised e-learning system, a pedagogically sound approach to adaptively composing and personalizing the access of learning contents in tertiary institutions. A mathematical model for the profiling of learners to determine their learning style based on the Honey and Mumford Learning Style Questionnaire (LSQ) was developed. Based on the mathematical model, the software for the Web-based Personalised e-Learning System was designed using the three tier client-server systems architecture. This thesis presents the main components which perform the functions of personalised learning materials to meet individual learner's learning requirements based on their learning style.

Furthermore, related literatures in the areas of learning theories, learning styles, e-learning were reviewed. The thesis also presented the model, system design and formal description of personalised e-learning system. Subsequently, the architectural design was implemented using the Apache Wamp Server, MySQL and PHP web technology tools. Lastly, the work recommended among other things the provision of a well maintained computer network infrastructure that will allow tutors and learners to easily compose and access learning contents, while also suggesting that further research be carried out on how to integrate the technology of Ontology and Semantic web into the system to improve its automation.

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GLOSSARY

LSQ	Learning Style Questionnaire
UML	Unified Modeling Language
ICT	Information and Communication Technology
LSI	Learning Style Inventory
IT	Information Technology
CSEL	Computer-Supported Collaborative Learning
PDA	Personal Digital Assistant
DCMI	Dublin Core Metadata Initiative
IMS	Instructional Management System
ADL	Advanced Distributed Learning
TCI/IP	Transmission Control Protocol/Internet Protocol
HTML	Hyper-Text Mark-up Language
SQL	Structured Query Language
DBMS	Database Management System
GUI	Graphical User Interface

Chapter One

Introduction

1.1 Background of the Study

Higher education history in Nigeria is amazing as the country now has more than one hundred and fifty tertiary institutions made up of universities, polytechnics and colleges of education (federal, state and privately owned). As students' enrolment into these institutions increases and government base funding for education decreases, the use of technology becomes more attractive to both administrators and instructors. In addition, a large percentage of courses (if not all) offered at the post-secondary institutions are in traditional, face-to-face lecture format. However, a new model of instruction follows the client-centred philosophy of business. This emphasizes a student-centred approach to instruction. Active, Collaborative and Personalised learning are central principles to this instructional paradigm.

Within this model, the traditional role of the lecturer changes significantly. The nature of the traditional student-teacher relationship is also transformed. The lecturer becomes the *guide on the side* or a facilitator of learning with the primary goal of meeting students' needs while providing instruction flexibly.

This student-centred model promotes the use of technology, particularly the development of a distributed e-learning environment and the creation of web-based courses or programmes. Information and communication technologies enable information sharing among academics globally, that is, information that can be used

to benefit both teaching practices and research. It is believed that harnessing the effective use of instructional technologies in education will improve student learning and therefore, secure a competitive edge in the global economy.

Numerous studies have demonstrated that student's active involvement in the learning process enhances learning; a process often referred to as *active learning* Benek-Rivera and Matthews (2004), Sarason and Banbury (2004). Simply stated, active learning has to do with "instructional activities involving students in doing things and thinking about what they are doing" Bonwell and Eisen (1991). Interactive instruction or "learning by doing" has been found to result in positive learning, Picciano (2002), Watkins (2005). In view of the fact that many new technologies and web-based activities are interactive, online coursework has the potential to create environments where students actively engage with material and learn by refining their understanding as they build new knowledge, Johnston, Killion and Omomen (2005), Pallof and Pratt (2003).

In addition to their active involvement, students better understand and apply material when problems and situations reflect real-life contexts, issues and experiences, Eble (1988). The use of real-world situations has the potential to promote deep learning through the development of critical thinking skills. Critical thinking involves the active and skilful analysis, synthesis, and application of information to unique situations, Scriven and Paul (2004). Learning retention and performance improve as students are required to apply what they have learned and then reflect upon the learning processes, Bereiter and Scardamalia (1989), Bransford *et al*. (2000).

Again, online instruction has the potential to provide opportunities to promote reflective thought and deep learning through realistically integrating and applying principles learned. Online instruction, such as a simulation, thrusts learners into a learning experience, increasing engagement and providing activities that actively engage learners to analyze, synthesize, and evaluate information while constructing knowledge, Driscoll and Carliner (2005).

Personalised e-learning offers an important alternative to the *one size fits all* approach of online learning, Brusilovsky (2001). More specifically it offers the potential to uniquely address the specific learning goals, Kaplan *et al*. (1993), prior knowledge, Milosavljevic (1997) and context of a learner so as to improve that learner's satisfaction with the course and motivation to complete that course.

1.2 Motivation

There are several motivating factors that led to the commencement of this thesis; among which are the fact that materials posted on the computer networks are increasing tremendously in volume and they are mostly unedited. This causes learners to waste precious study times searching for materials that at the end may not suit their study needs. However, with a web-based personalised e-learning system, learners can easily manage these web contents and in so doing efficiently utilize their study time.

In addition, a large percentage of courses offered at the higher institutions are in traditional, face-to-face lecture format. However, a new model of instruction follows the client-centered philosophy of business. This emphasizes a student-centered approach to instruction. Active, collaborative and personalized learning are central principles to this instructional paradigm shift. Within this model, the traditional role of the lecturer changes significantly and the nature of the traditional student-teacher relationship is also transformed.

1.3 Objectives

The objectives of this project are to:

a. Develop a model for a web-based personalised e-learning system that will allow teachers and students to efficiently utilize the power of computer networks to deliver and access educational services in a personalized manner.

b. Design the prototype web-based personalised e-learning application that allow teachers to author learning objects in a standardized uniform format and that allows students study those materials in a style most convenient to them, using standard software design techniques hence creating a blueprint that can easily be replicated or improved upon by other researchers as technology dictates.

c. Implement the automatic profiling of students to determine their preferred learning style based on Honey and Mumford Learning Style Questionnaire (LSQ).

1.4 Methodology

A review of related literature and contemporary issues in e-Learning, learning theories and learning styles was carried out. Mathematical models and artifacts of the Unified Modeling Language (UML) were used to illustrate the logic and concept of the application. Then a web based personalised e-learning application was developed based on the three tier client – server architecture; using the following technologies:

a. Macromedia Dreamweaver was used to develop the front-end, which comprises of web interfaces.
b. PHP and Apache Web server were used for developing the back-end and coding of system logic.
c. MySQL was used for the database development.
d. Internet Explorer and Mozila Fire fox were browsers used for testing and debugging the application.

1.5 Contribution of the study to knowledge

The research established a model and a formal description of personalised e-learning system, a pedagogically sound approach to adaptively composing learning activities in tertiary institutions which allows teachers and students to efficiently utilize the power of computer networks to deliver and access educational services in a personalized manner. The research further established means to help learners discover and optimize there personal study habits and time.

1.6 Organisation of the thesis

The thesis was organized in five chapters. Chapter one covers the background of the study, research motivation, research objectives, research methodology and contribution of the study to knowledge. In chapter two, some existing literatures on learning theories, learning styles definition and concepts, learning style models, trends in the use of computer in education, e-learning and personalized e-learning systems were reviewed. Chapter three presented and discussed the systems design considerations, mathematical model of the web-based personalized e-learning system, content development model, modeling and design of the new systems architecture and the database model of the system. Chapter four focused on the requirement, technology and implementation of the new system. Finally, chapter five presented the summary, conclusion, recommendations and further research.

Chapter Two

LITERATURE REVIEW

2.0 Introduction

Over the last two decades, the search for new and efficient ways of integrating technology into education for improved teaching and learning experiences and the delivery of ancillary educational services has resulted in a dramatic increase in the use of Information and Communication Technology (ICT) based solutions in educational service delivery generally known as electronic learning (**e-learning)**.

2.1 Learning Theories

In education, learning theories are attempts to explain how people learn, there by helping in understanding the complex process of learning. There are basically three main schools of thought in learning theories - Behaviouralism, Cognitivism, and Constructivism. This thesis will briefly discuss these fundamental learning theories to highlight their potential influence on personalised e-learning programme.

Behaviourist theorists define learning as nothing more than the acquisition of new behaviour. From an educational perspective the behaviourist learner is viewed as a passive recipient of knowledge. Learning can then be viewed as the acquisition of this objective knowledge through rehearsal and correction, Tuckey (1992). From teaching perspective behaviouralism maintains that the role of a teacher is to reinforce correct behaviour from their students. The behaviourist expects the teacher to predetermine all the skills they believe are necessary for the students to learn and then present them to the group in a sequenced manner, Conway (1997). The influence of this theory on

personalised e-learning is twofold, first the learning system should reinforce student behaviour that it perceives to be correct and second, the learning system should have a predetermined view as to the best order in which skills and knowledge should be presented.

Cognitivists maintain that there is an external reality and an internal representation of that reality. According to Bruner (1960), information equals learning, so outward appearances to that effect are merely communications illuminating the result of learning rather than learning itself. As the mind seeks a view of the objective reality it gives through a number of processes when it receives information (by attention); this information is then integrated into the inherent order of memory via a process of encoding; information becomes knowledge when it is integrated into the existing cognitive structure; and knowledge can then be remembered in the process of retrieval.

From the educational perspective, the emphasis on teaching and learning strategies shifts to techniques to complement the attention, encoding and retrieval of knowledge. This can be achieved by careful organisation of content, and the use of analogies and mnemonics, Newby (1996).

Computers process information in a similar fashion to how cognitive scientists believe humans do. Information is received, stored and retrieved. When viewed from personalised e-learning perspective the role of the computer in the educational domain would be to present a view of the information to be learned and drill the students until they understand it, Adewale (2007).

Finally, constructivism subsumes the attention, encoding and retrieval of knowledge processes from cognitivism, but maintains that there is no single accurate representation of the world, only interpretations of experience. Knowledge is a collection of concepts which fits with the experience of the individual. New information is important for different reasons to the recipients of the information, Tuckey (1992). From the perspective of e-learning, the information presented would have to be relevant to the learner in the framework of what they have previously learned, Henze, Nejdl and Wolpers (1999a; 1999b).

The constructivist approach implies that learners will learn more with a teacher than from a teacher, Newby (1999b). Similarly, learners will learn more with a computer than from a computer, Reeves (1998). It is argued that traditional teacher-centric approaches to learning do not transfer successfully to technology and must be revolutionised. The philosophy must change from computers as teaching machine to computers as tools to empower learners and teachers, Oppenheimer (1997).

2.2 Learning Styles: Definition and Concepts

Although learning style may be simply defined as the way people come to understand and remember information, there are various other definitions for the term. James and Gardner (1995), for example, define learning style as the "complex manner in which, and conditions under which, learners most efficiently and most effectively perceive, process, store, and recall what they are attempting to learn". Merriam and Caffarella (1991) present Smith's definition of learning style, which is popular in adult education, as the "individual's characteristic way of processing information, feeling, and behaving

in learning situations". Swanson (1995) quotes Reichmann's reference to learning style as "a particular set of behaviours and attitudes related to the learning context" and also presents Keefe's definition of learning style as "the cognitive, affective, and physiological factors that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment".

Litzinger and Osif (1993) define learning styles as the ways in which children and adults think and learn. Learning styles are sometimes described as the personally constructed filters people use to orient their relationships with the world, as stated by O'Connor (1997). These filters are influenced by factors such as age, maturity, and experience; as such they are likely to change over time. In addition, the study of learning styles has provided us with categories or groupings of these filters. For example, filters may be categorised by the senses (auditor- visual or kinaesthetic). Some people may respond to auditory information more readily than information presented visually, for example. Other studies of learning styles have focused on a combination of sensory and cognitive approach to examine how students process information. One result is Gardner's (1983) theory of multiple intelligences, which categorizes learning styles as visual-spatial (ability to perceive the visual), verbal-linguistic (ability to use words and language), logical-mathematical (ability to use reason, logic, and numbers), bodily-kinaesthetic (ability to control body movements and handle objects skillfully), musical rhythmic (ability to produce and appreciate music), and interpersonal (ability to relate and understand others intrapersonal (ability to self-reflect and be aware of one's inner state of being), and naturalistic (ability to use awareness of the natural world and the sciences). Armstrong (1994) examined the

use of Gardner's theory in the classroom and came to four conclusions: each person possesses all eight intelligences, the intelligences have the capacity to be developed to higher levels, the intelligences work together in complex ways, and there exist numerous ways to be intelligent. Yet other theorists have looked at the study of learning styles through the lens of gender, noting that males and females tend to approach learning and learning situations differently, Belenky *et al* (1986).

In their review of the myriad studies on learning styles, Claxton and Murrell (1988) noted four main categorizations of the ways people learn: personality models', information processing models', social interaction models', instructional and environmental /preference models.

Underlying learning style research is the belief that students learn best when they approach knowledge in ways they trust. However, an instructor can also design activities that challenge students to develop their skills in another learning preference, O'Connor (1997). Regardless of which approach or theoretical framework an instructor uses, the key is to recognise that differences exist in learning styles and and these differences must be accounted for somehow in an online class. A *one size fits all* approach will not work. It is a mistake to assume that every virtual student looks and feels the same. Although the internet is viewed as the great equaliser, some accommodation must be made for individual differences, including learning style, gender, culture, and the presence of disability.

Schroeder (1993) notes: "Faculties nationwide are bewildered and frustrated with the students they see in their classrooms today. Unfamiliar with many of the new characteristics, they see contemporary students as hopelessly under-prepared or less bright or motivated than previous generations. Clearly, the ways contemporary students view knowledge and derive meaning are vastly different from those of their instructors. As faculty, we have generally espoused the common belief that students learn and develop through exposure that the content is all-important. We have been accustomed to a traditional learning process where the one who knows (the teacher) presents ideas to one who does not (the student). . . This approach may work for us but it may not work for the majority of today's students".

Schroeder (1993) believes that our colleges and universities are experiencing an increasing disparity between lecturers and students and between teachers and learners. He suggests that understanding how students learn and where they are in the process can help instructors design learning environments that are more responsive to students' needs. Using traditional lecture-based teaching styles does not address all learning preferences.

When online teaching and learning is added to the mix, knowing that it is a different type of student who takes online courses, the picture becomes even more muddied for the instructor. Paulsen (1995) suggests that incorporating activities that are one-alone (activities that are structured for minimal interaction with others), one-to-one (activities that are done in pairs or through e-mail), one-to-many (the use of bulletin boards, where material can be accessed), or many–to-many the use of computer

conferencing techniques) can successfully address all learning styles of the virtual student.

If the instructor chooses to incorporate many of these activities in course design, then the learning preferences of most of the students in the group will be addressed. Focusing only on reading and discussion to the exclusion of the rest (as many online courses do) may cause some students who are not oriented to learning in that way to get bored. Using a variety of activities, then, is the best insurance against losing student because of learning style issues.

Claxton and Murrell (1988) note that instructors may choose to match or mismatch activities in a course to a student's learning style, depending on the purpose and goals of the course. They believe that matching activities to learning style is particularly appropriate when working with students who are new to the college experience or who are poorly prepared to learn, because the lowest course attrition and most effective learning occur when learning style is matched. However some mismatching is also appropriate so that students can learn to learn in new ways and bring into play ways of thinking and aspects of self not previously developed.

How might an instructor accomplish both matching and mismatching skills in an online course? O'Connor (1997), notes that technology actually increases the range of activities which an instructor can use to address varying learning styles. He looks specifically at activities in three general categories: adding alternatives, learning cycles, and complex activities.

When adding alternatives, an instructor makes options available to students for the completion of assignments. In the face-to-face classroom, a student may choose to do a hands-on activity instead of writing a paper, perhaps creating a collage or a work of art that demonstrates the concepts being studied. Online, an instructor may allow a student to create a web page or a power point presentation instead of writing a paper. Including internet research in a course also taps into multiple learning styles because students are given the latitude to seek out references and resources applicable to the content. Simulations and games are other ways to achieve learning objectives.

Learning cycles involve designing systematic sets of activities that facilitate all learning styles before completing an assignment. Different types of learning activities are incorporated into each phase of the learning process and the material is organized around themes or problems with an emphasis on the development of a skill set before the student can move on to the next phase of learning. Various units in an online course can be developed with learning cycles in mind. Simulations, for example, give students an opportunity to develop and demonstrate skills, especially when they carry them out in teams. A simulation in the area of counseling psychology asks learners to take the various roles that may be present on a treatment team, such as counselors, nurses, and family therapists. An actual case is presented to the team with a series of increasingly difficult tasks to complete. With the completion of each task, a learning cycle is completed. Collaborative projects that require each student to contribute to the final product is another way to incorporate learning cycles into an online course. Another strategy might be to have students submit drafts of assignments as the term progresses or demonstrate the completion of a piece of project.

Complex activities demand that students approach a topic through the use of multiple skills. The instructor provides broad guidelines for completion of the project and then students organize and complete the project based on their styles and needs. Complex activities usually span the entire term and are helpful in organizing the course. Online complex projects can form the basis of collaborative activity. Students can connect through e-mail or chat to prepare their project, and many software programs can assist in its completion. Some students may choose to contribute graphics to the final product, while others contribute text or organize material. The completion of a collaborative, comprehensive group paper or project is a good example of the inclusion of complex activities into a course.

Because learning style preferences change with age, experience, and maturity, it makes sense that the activities designed to engage various learning styles in a traditional undergraduate course would be different from those designed to engage adult learners. Schroeder (1993) believes that when working with undergraduates, beginning with concrete learning experiences and then building toward abstract understanding is an appropriate strategy that engages the learning styles of younger, less mature learners. In other words, activities in an online course can be structured to provide experience first and then the theory on which the experience is based.

One of the things that are known about adult learners is that they tend to be goal-oriented and experience-based. Adults often see learning as the acquisition of knowledge that can be used in practice or for career advancement. The more directly an adult can employ the material being studied, the more likely he will retain that

knowledge. Consequently, beginning with concrete learning experiences is not necessarily a bad approach when working with adults either.

Where adults and traditional undergraduates differ is in the degree of structure they need to complete a course successfully. Traditional undergraduates tend to appreciate knowing precisely what is expected of them. They prefer sequential learning tasks and find open-ended assignments, independent projects, or self-designed learning situations somewhat challenging, Schroeder (1993).

However, although adults fare better in situations where there is more ambiguity, it should not be assumed that structure is unnecessary. When working online, not providing structure and leaving things to chance can mean the demise of a course. But adults do well with self-directed and collaborative learning experiences and seem to need less direction and structure in order to complete them. Adult students online have an easier time organizing tasks with one another and working toward a successful outcome.

In discussing the issue of learning styles particularly as applied to adults, Boud and Griffin (1987) assert that we all possess six learning capabilities, regardless of our learning style preference: rational, emotional, relational, physical, metaphoric, and spiritual. They contend that most of our education is focused on and developed around the rational to the exclusion of the other capabilities. They further note that if the rational, emotional, relational, physical, and metaphoric capabilities are encouraged, then the spiritual element will evolve.

2.3 Review of Learning Styles Models

In a recent major review of the literature on learning styles, Adewale (2007) and Coffield *et al*. (2004) identified many of the models of learning styles from which they were able to select thirteen major models, with their associated measuring instruments, for analysis. They further classified these into five families along a fixedness dimension as follows: learning styles as one component of a relatively stable personality type; learning styles as flexibly-stable learning preferences; styles as learning approaches and strategies: constitutionally-based learning styles and preferences; and learning styles reflecting deep-seated features of the cognitive structure, including patterns of ability.

Within each family the authors carry out a review of the themes and concepts that link the theorists in the group, and then proceed to carry out very systematic evaluation of each of the thirteen chosen models, looking closely at the empirical support and pedagogical impact.

However, for the purpose of this work, more emphasis will be on the second family - learning styles as flexibly-stable learning preferences which was developed and popularized by David Kolb in the early 1970s. This is because the learning style theories by Honey and Mumford (2000), that were implemented in this thesis stemmed from David Kolb's work.

2.3.1 Flexibly stable learning preferences

David Kolb (2000) theory of experiential learning and the instrument which he devised to test the theory (the Learning Style Inventory (LSI)) have generated a very considerable body of research. The starting point was his dissatisfaction with traditional methods of teaching management students, which led him to experiment with experiential teaching methods. He then observed that some students had definite preferences for some activities (e.g. exercises), but not others (e.g. formal lectures): 'from this emerged the idea of an inventory that would identify these preferences by capturing individual learning differences'.

For Kolb and those who have followed in his tradition, a learning style is not a fixed trait, but 'a differential preference for learning, which changes slightly from situation to situation. At the same time, there is some long-term stability in learning style'. Kolb goes so far as to claim that the scores derived from the LSI are stable over very long periods. For example, the learning style of a 60 year old will bear a close resemblance to that individual's learning style when he was an undergraduate of 20. It is, however, difficult to accept this claim when the necessary longitudinal research has still to be carried out.

Be that as it may, Kolb's four dominant learning styles (diverging, assimilating, converging, and accommodating), each located in a different quadrant of the cycle of learning, have been enormously influential in education, medicine, and management training. Here it is more relevant to see Kolb as main inspiration for large numbers of

theorists and petitioners who have used his original ideas to generate their own questionnaires and teaching methods.

For example, Honey and Mumford (2000) make explicit their intellectual debt to Kolb's theory, although they also make it clear that they produced their own Learning Styles Questionnaire (LSQ) because they found that Kolb's LSI had low face validity with managers. They also made changes to Kolb's nomenclature by substituting *Reflector, Theorist, Pragmatist* and *Activist* for Kolb's rather more unwieldy terms Reflective Observation, Abstract Conceptualization, Active Experimentation and Concrete Experience.

Kolb (1984) was explicit in acknowledging the intellectual origins of his theory of experiential learning and of the LSI. His model is based on research in psychology, philosophy and physiology. For example, the relevance of brain research to this theory is exemplified in the finding that 'the modes of knowing associated with the left and right hemispheres correspond directly with the distinction between concrete experiential and abstract cognitive approaches to learning'.

The three main figures, among others on whose work Kolb has built his theory of experiential learning are John Dewey, Kurt Lewin, and Jean Piaget. For instance, from Dewey's pragmatism he draws the notion of experience as an organizing focus for learning; from Lewin's social psychology, the idea of action research; and from Piaget's genetic *epistemology,* the dialectic between assimilation and accommodation.

Through his research, Kolb established four major learning styles with their characteristics as follows:

The converging style (abstract, active) relies primarily on abstract conceptualization and active experimentation. It is good at problem solving, decision making, and the practical application of ideas. It does best in situations like conventional intelligence tests. Also, it is controlled in the expression of emotion and it prefers dealing with technical problems rather than interpersonal issues.

The diverging style (concrete, reflective) emphasizes concrete experience and reflective observation. It is imaginative and aware of meanings and values. The diverging style views concrete situations from many perspectives, adapts by observation rather than by action, is interested in people, and it tends to be feeling-oriented.

The assimilating style (abstract, reflective) prefers abstract conceptualization and reflective observation, it likes to reason inductively and to create theoretical models The assimilating style is more concerned with ideas and abstract concepts than with people. It thinks that it is more important that ideas be logically sound than practical.

The accommodating style (concrete, active) emphasizes concrete experience and active experimentation. It likes doing things, carrying out plans and getting involved in new experiences. It is good at adapting to changing circumstances. It solves

problems in an intuitive, trial-and-error manner and it is at ease with people even though it is sometimes seen as impatient and 'pushy'.

This explanation of Kolb (1985), which essentially maintains that learning is a process involving the resolution of dialectical conflicts between opposing modes of dealing with the world (that is action and reflection, concreteness and abstraction), leads to this definition of learning styles: 'learning styles represent preferences for one mode of adaptation over the others; but these preferences do not operate to the exclusion of other adaptive modes and will vary from time to time and situation to situation'.

Kolb (1985), claims that learning styles play a significant role in at least five main fields (behaviour/personality, educational specialization, professional career, current job and adaptive competencies). The most relevant field to explore here is that of educational specialization. He argues that our educational experiences shape our learning styles and so one should not be surprised to find relations between specialization and learning styles. So, for example, undergraduate students of business, management and education administration are found by Kolb (1985) to have accommodative learning styles; engineering and economics students are convergers; history, English and psychology students are divergers; mathematicians, sociologists, educational researchers, theologians, and chemists are predominantly assimilators; while physicists are on the border between convergers and assimilators.

It is important to recognize that Kolb (2000) conceives of learning styles *not* as fixed personality traits, but as adaptive orientations that achieve stability through consistent

patterns of transaction with the world. He maintains that a learning style is a differential preference for learning, which changes slightly from situation to situation. At the same time, there's some long-term stability in learning style.

He further argues that his theory of experiential learning provide useful framework for the design and management of all learning experiences and, moreover, he makes three practical suggestions. The first practical suggestion is that teachers and learners should explicitly share their respective theories of learning a process which would create four benefits.

a. Students would understand why the subject matter is taught as it is and what changes they would need to make to their learning styles to study this subject.
b. Teachers would identify the range of learning styles among the student body and would modify their teaching accordingly.
c. Both teachers and students would be 'stimulated to examine and refine their learning theories', Kolb (1984).
d. Through dialogue, teachers would become more empathetic with their students and so more able to help them, improve their knowledge and skills. Freedman and Stumpf (1978) make, however, the reasonable point that such dialogues will not always take place in ideal conditions, that is, in small classes which provide individual attention from a tutor who is trained in the theory and practice of learning styles.

The need to individualize instruction is the second practical conclusion that Kolb draws from his research into learning environments. This is, of course, easier said than

done, particularly in further education with large group sizes and a modular curriculum, but he believes that information technology will provide the breakthrough, together with a shift in the teacher's role from dispenser of information to coach or manager of the learning process, Kolb (2000).

Finally, Kolb (2000) is concerned about the growing specialization in higher education and does not want students to be equipped only with the learning styles appropriate for particular careers. Instead, he argues for 'integrative development', where students become highly competent in all four learning modes: active, reflective, abstract and concrete. So his aim was to produce balanced learners with a full range of learning capacities, rather than simply matching instruction to existing learning styles. His belief of yesterday has come true today as information technology is enabling individualized instruction worldwide.

2.3.2 Honey and Mumford's learning styles

In the late 1970s, Alan Mumford invited Peter Honey to join him in studying the then relatively neglected topic of how managers learn. They began by administering Kolb's LSI which was the first and for some time the only, available diagnostic tool for exploring how individuals learn. Because the LSI was found to have low face validity with managers, Honey and Mumford spent four years experimenting with different approaches to assessing individual differences in learning preferences before producing the LSQ in 1982, Adewale (2007). So instead of asking people directly how they learn, as Kolb's LSI does, Honey and Mumford give them a questionnaire which probes general behavioural tendencies rather than learning. The new instrument

was designed to be used as a starting point for discussion and improvement. Peter Honey has continued working in the same vein, producing a series of manuals for trainers and self-help booklets for learners, Honey (1994).

Honey and Mumford (1992) define a learning style as ‘a description of the attitudes and behaviour which determine an individual's preferred way of learning'. The four learning styles are described as those of activists, reflectors, theorists and pragmatists.

The authors are keen to emphasize that 'no single style has an overwhelming advantage over any other. Each has strengths and weaknesses but the strengths may be especially important in one situation, but not in another'. They are also careful not to exaggerate the significance of personal learning styles and explicitly acknowledge that they constitute only one factor in a range of influences which include past experiences of learning, the range of opportunities available, the culture and climate for learning, and the impact of the trainer/teacher, among many other factors.

Moreover, it is emphasized that the LSQ should be used for personal and organizational development and not for assessment or selection, an approach which, it is argued, encourages respondents to behave honestly, Adewale (2007).

It is also clear from Honey and Mumford (2000) that the two main uses for the LSQ, as envisaged by the authors, are to devise personal development plans and to show the activist manager, the reflector manager, the theorist manager, and the pragmatist manager

how to help their staff learn by, for example, choosing activities that are congruent with the preferred style of the learners.

Honey and Mumford argue that 'managers, if they encourage learning at all, will tend to do so in ways consistent with their own learning styles'. An approach which improves the quality of support for workplace learning is to be welcomed, particularly given the findings of research which show that 'a major factor affecting a person's learning at work is the personality, interpersonal skills, knowledge and learning orientation of their manager', Eraut *et al*. (1999).

2.4 Trends in the Use of Computers in Education

Mustaine (2006) stated that Computers have become an integral part of day-to-day life. Since the advent of personal and home computers, they have become an integral part of the education system. Having computers as a part of one's education can prove very helpful. Being good in studies and computers can secure better job prospects. In this age and time computer knowledge is a must. The computer networks – Internet - these days have a powerful impact on the ways in which individuals, universities and organizations can communicate with each other.

As access to and use of these computer networks grew, the development of the new field of online learning emerged which has helped to shape cyberspace into human space, an area for social contact and knowledge building in the 1980's, online education was only limited to discourse oriented disciplines such as the humanities, social sciences and education itself. It was the lack of multimedia capacity that limited the development of

tools to support new discourse patterns. Other disciplines could not participate in online education. The advent of the Internet Web paved way for other disciplines in the field of science and engineering, with the capability to present graphics, sound and animation, and this gave rise to an explosive growth in educational adoption of the Internet, Adewale and Agbonifo (2007).

The application of appropriate computer technologies to the processing of information is known as Information Technology, (IT). When Information Technology is combined with telecommunication it gives rise to Information and Communication Technology (ICT). Although there are many aspects of computing today but our major concern is ICT as it relates to education. ICT related tools and gadgets used in education include but are not limited to radio, television, computers, mobile phones, satellite, personal digital assistance, and blackberry.

The application of ICT as a means of facilitating delivering quality teaching has been a topic of discussion by several authors in the past one decade. It has been studied from different perspectives and referred to by different names. Some of such names include Projected and Electronic Learning aids, Electronic Learning or e-learning, and Mobile Learning or M-Learning, Aweriale (2004). This litany of names is due to the dynamic nature of the field of ICT which keeps witnessing new innovations and the constant quest by educators to discover new and convenient ways of integrating technology into quality educational delivery.

2.5 Electronic Learning (E-Learning)

Folorunso, Longe and Ijere (2003) described e-learning as a type of learning that is delivered or enabled via electronic technology. It encompasses learning delivered via a range of technologies such as the Internet, Television, Videotape, Intelligent Tutoring Systems, and Computer-based training. Adibe, (2003) opined that the term can be used to describe a range of learning situations, including distance learning, web-based learning, virtual classrooms, and more. All these are forms of education derived through the use of Information Technology. Adibe (2003) also states that what they have in common is the use of communication technology that serves as a medium of learning.

Wachira, Keengwe, and Onchwari (2008) use the term e-learning to refer to computer based training which incorporates technologies that support interactivity beyond what is normally provided by a single computer. They explain further that it can refer to an approach that facilitates and enhances learning through the use of computer and communication technology such as personal computers, digital televisions, mobile phones, internet, e-mail, and collaborative software. E-learning continues to be popular because of its ability to provide greater convenience, time flexibility and self-paced learning to students while avoiding travel time and cost.

According to Aniebonam and Owei (2003) three technologies that are well suited for distributed teaching (using IT devices situated in different locations and learning in business–related education) are computer-supported collaborative learning, multimedia/hypermedia, and experiential simulation. They conclude that all or any of these methods can be applied in a massive effort towards educating students in emerging

economies, especially in the African continent, benefiting institutions where human resources are limited or unavailable. They also stated that, Computer-Supported Collaborative Learning (CSEL) enhances team performance through tools for communicating each person's ideals, structuring group dialogue, and decision making, recording the rationale for choices, and facilitating collective activities.

Multimedia and hypermedia are learner controlled interactive technologies; users can tailor presentations by selecting path through the material customized to their interests. Also this type of educational application displays data in multiple formats simultaneously. In so doing, it enables people with various learning styles to pursue material presented in their preferred mode of communication.

2.6 Mobile Learning (M-Learning)

Mobile Learning (m-learning) is also a means of educational delivery that came as a result of the recent technological advancement in the use of mobile technologies or devices such as mobile phones and handheld computers, to enhance the process of learning or skill acquisition. Mobile devices are electronic devices that are handy in nature; they can easily be carried from one place to the other with one hand and can even be placed in the pocket. Such devices include handsets, personal digital assistants, (PDAs), and pagers. Mobile Learning allows instructional designers and instructors to utilize the strengths of mobile platforms to bring a variety of new applications to the learning environment.

Mobile technology is strategic to many organizations and activities. Education is no exception! The use of mobile technology has not only extended desktop-based online learning environment into the mobile and wireless channel but also enabled education to take place anytime, anywhere. The use of mobile technology in education is also known as “mobile education” or “m-education”, Nah, Siau, and Sheng (2005).

Mobile technologies have provided unique opportunities for educators to deliver educational materials efficiently, and to support the cognitive and social process of student learning. Educational materials can be delivered to students through mobile devices. Students can communicate and interact with peer students and educators in real-time using mobile technology. Mobile technology can also be integrated into curriculum design to improve interactivity in the classroom.

Applications of mobile technology in education can provide benefits to both students and educators. Mobile technology provides greater flexibility in student learning. Students can have access to educational materials through their mobile devices, which enable them to learn as and when the need arises and when the time is right for them, no matter where they are even when they are on the move. With mobile devices, educational materials are not only readily available to students but they can also be delivered to students based on their needs and preferences (personalized e-learning). Mobile technology can also benefit the educators by providing a new means of education delivery, as well as adding a new dimension for student-instructor interaction. For example, wireless classroom response systems can be integrated into classroom instructions to gather students’ responses and provide instantaneous feedback to students on their performance. Such uses can help to

improve classroom interactivity, enhance teaching effectiveness, and promote student learning.

As a new phenomenon that is gaining popularity, mobile technology in education has generated significant interest and attention from both researchers and practitioners, Chen and Kinshuk (2005).

In the light of the foregoing discussions, it is imperative that any successful framework developed for implementing personalised e-learning on the web for personal computers will also open the door for recreating the successes with mobile devices.

2.7 Personalized E-Learning Systems

Away from the more traditional e-learning models reviewed in the section above, is a new e-learning paradigm which follows the client-centered philosophy of business – where the client is always king. This model emphasizes a student-centered approach to instruction where individual learner's learning requirements are met by personalizing learning materials using Personalized E-learning Systems. Active, Personalised and Collaborative learning are central principles to this instructional paradigm, Adewale (2007).

Within this model, the traditional role of the lecturer changes significantly. The nature of the traditional student-teacher relationship is also transformed. The lecturer becomes the guide on the side or a facilitator of learning. A primary goal of the lecturer is to meet student needs while providing instruction flexibly.

This student-centred model promotes the use of technology, particularly in the development of distributed e-learning environments and the creation of web-based courses or programmes. Information and communication technologies enable information sharing among academics globally, that is, information that can be used to benefit both teaching practices and research. It is believed that harnessing the effective use of instructional technologies in education will improve student learning and therefore, secure a competitive edge in the global economy.

Numerous studies have demonstrated that student's active involvement in the learning process enhances learning, a process often referred to as active learning, Benek-Rivera and Matthews (2004); Sarason and Banbury (2004). Simply stated, active learning involves "instructional activities involving students in doing things and thinking about what they are doing", Bonwell and Eisen (1991). Interactive instruction or "learning by doing" has been found to result in positive learning Picciano (2002); Watkins (2005). Because many new technologies and web-based activities are interactive, online coursework has the potential to create environments where students actively engage with material and learn by action, refining their understanding as they build new knowledge, Johnston, Killion and Omomen (2005); Pallof and Pratt (2003).

In addition to the student's active involvement, students better understand and apply material when problems and situations reflect real-life contexts, issues and experiences, Eble (1988). The use of real-world situations has the potential to promote deep learning through the development of critical thinking skills. Critical thinking involves the active

and skillful analysis, synthesis, and application of information to unique situations, Scriven and Paul (2004). Learning retention and performance improve as students are required to apply what they have learned and then reflect upon the learning processes, Bereiter and Scardamalia (1989); Bransford , Brown and Cocking (2000).

Again, online instruction has the potential to provide opportunities to promote reflective thought and deep learning through realistically integrating and applying principles learned. Online instruction such as a simulation thrusts learners into a learning experience, increases engagement and provides activities that actively engage learners to analyze, synthesize, and evaluate information while constructing knowledge, (Driscoll and Carliner (2005).

Personalised e-learning offers an important alternative to the one size fits all approach of online learning, Brusilovsky (2001); Brusilovsky (1998). More specifically it offers the potential to uniquely address the specific learning goals, Kaplan, Fenwick, and Chen (1993), prior knowledge, Milosavljevic (1997) and context of a learner so as to improve that learner's satisfaction with the course and motivation to complete that course.

Chapter Three

System Modeling and Design Architecture

3.1 Design considerations

When designing a personalised e-learning course there are many ways in which the course can be personalised. For example, it can be personalised according to the learners' learning goals and/or their preferred learning styles. It is commonly believed that most people favour some particular method of interacting with, taking in, and processing stimuli or information. Based on this concept, the idea of personalised "learning styles" originated in the 1970s, and has gained popularity in recent years. A learning style is the method of learning peculiar to an individual that is presumed to allow that individual to learn best. Honey and Murmford (1992) define learning style as 'a description of the attitudes and behaviour which determine an individual's preferred way of learning'. Subsequently they come up with four learning styles which they describe as those of activities, reflectors, theorists and pragmatists.

Learning styles attempt to establish indicators on how learners perceive, process, and interact with learning environments. Considering these indicators, it is possible to design learning materials and instructional designs more suitable to the manner each learner learns. Many learning style approaches had been presented in Adewale (2007). There are some that are appropriate only for a specific field, like the Felder and Silverman learning style model that is suitable only for engineering education.

Meanwhile the Honey and Mumford (2000) learning style model is categorized as being information processing model type or more specifically it is an information processing model based on experiential learning. The other models categorize the learner on the basis of less relevant aspects related to learning (e.g. senses and the environmental factors) whereas learning has mainly to do with perceiving and processing information. For this reason, the Honey and Mumford (2000) learning style model is an appropriate model to choose for the development and implementation of the web-based personalised e-learning system Adewale (2007). The model also provides an ideal structure for reviewing experience, learning lessons, and planning improvements.

To determine which of the four learning styles a learner may prefer, Honey and Mumford (2000) developed a Learning Style Questionnaire (LSQ) with a list of 36 questions as shown in the table below which the learners have to respond to.

S/N	QUESTION	LEARNERS RESPONSE			
		TOTALLY AGREE	PARTLY AGREE	PARTLY DISAGREE	TOTALLY DISAGREE
1	I am eager to test new ideas in practice				
2	I like to plan my work properly				
3	I do not believe in impulsive decisions				
4	I act spontaneously				
5	I believe mainly in practical facts				
6	I like the company of sociable people				
7	I want to see the connections between theory and practice immediately				
8	I tend to rely on principles and theories				
9	I prefer having lots of drafts before making the final version				
10	I usually say immediately what I think in order to achieve results quickly				
11	I do not comment before I've thought things through				
12	I get bored with routines				

13	I want to consider all information carefully before making any decisions				
14	I try to consider things in their logical context				
15	I find new experiences interesting				
16	I am always a very practical person				
17	I work out my thoughts before I express them				
18	I like to take several points of view into consideration before deciding my own				
19	Straight actions is more typical for me than careful ones				
20	I tend to produce innovative ideas				
21	I tend to get straight to the point in the meetings				
22	I do not act without proper planning				
23	I like to work in detail before coming to a conclusion				
24	I always prefer a systematic way of working				
25	I work analytically when solving problems				
26	I do not hide my feelings				
27	I work effectively to see the practical results				
28	I avoid making hasty conclusions				
29	I am interested in putting ideas into practice				
30	I tend to organize my thoughts well				
31	I seek theoretical principles behind things and events				
32	I am usually the innovative person in the social situations				
33	I like talking more than listening				
34	Scientifically proved theories interest me				
35	I find it difficult to be spontaneous				
36	I am open to use any efficient method to reach results				

Table 3.1: Honey and Mumford Learning Style Questionnaire (LSQ) – source Adewale (2007).

This web-based personalised e-learning system is based on this Honey and Mumford LSQ. Using this questionnaire, the learners style will be filtered using the mathematical model in section 3.2 (Equation 3.2) and based on this, the system will determine the appropriate learning object to present to the learner. For example, a piece of content

which was best suited for an activist and pragmatist received a high value in the metadata tags for activist and pragmatist and a lower value for reflector and theorist. Therefore, this piece of content would be selected for a learner who is categorized as being an activist or a pragmatist.

3.2 Mathematical model of the web-based personalised e-learning system

Let c_{ik} be courses to be learned by the learners where i = 1, 2, 3, 4, 5 (learner's year of study) and k = 1, 2, .., n (k is the course number registered for). For easy learning and representation each course syllabus is split into topics (t_l) which in turn are split into subtoptics (s_{lm}) where necessary with l, m = 1, 2, 3, ….

Furthermore, let l_q represents the various learners of the c_{ik}, q = 1, 2, 3… ls_s represents the different learning styles for the personalised learning, s = 1, 2, 3 and 4; x_j represents the questionnaire for determining l_q's learning style(s) or preference(s).

Therefore, let

$$Personalised\ learning = F(c_{ik}, l_q, ls_s,) \quad (3.1)$$

The structure of c_{ik} is as shown in (Figure. 3.1).

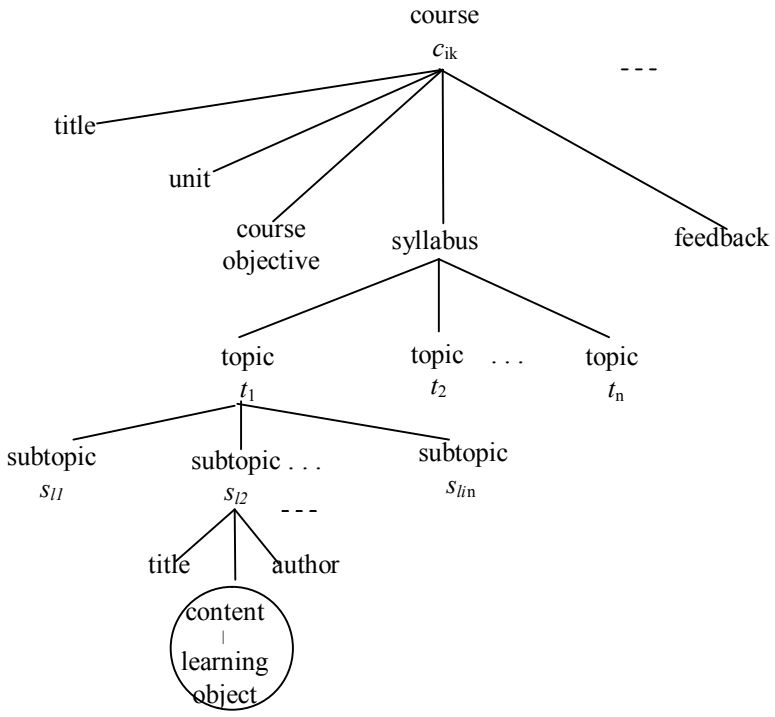


Figure 3.1: Course tree structure – source Adewale (2007) modified.

Learning objects are often used as components to assemble larger learning modules or complete courses, depending on different educational needs. The assembly of these learning objects is also known as *content packaging* and provides a standardized way (metadata standards) of exchanging digital learning resources between different learning systems.

Each t_l or s_{lm} is presented to learners using a web page for easy learning. It is assumed that one or more t_l or s_{lm} shall be covered within a study period.

Equation (3.2) demonstrates how course c_{ik} will offer personalization based on the learner l_q's learning style. A learner l_q's learning style ls_s is identified through his responses to the questionnaire x_j, which is used to probe the general behavioural tendencies of the l_q.

The learner l_q's preferred learning style is determined by the highest score a learner obtained as follows.

$$l_q(ls_s) = \begin{cases} A \text{ iff } \sum_{j=1}^{9} x_j > \left[\sum_{j=10}^{18} x_j \wedge \sum_{j=19}^{27} x_j \wedge \sum_{j=28}^{36} x_j \right] \\ R \text{ iff } \sum_{j=1}^{9} x_j < \sum_{j=10}^{18} x_j > \left[\sum_{j=19}^{27} x_j \wedge \sum_{j=28}^{36} x_j \right] \\ T \text{ iff } \left[\sum_{j=1}^{9} x_j \wedge \sum_{j=10}^{18} x_j \right] < \sum_{j=19}^{27} x_j > \sum_{j=28}^{36} x_j \\ P \text{ iff } \left[\sum_{j=1}^{9} x_j \wedge \sum_{j=10}^{18} x_j \wedge \sum_{j=19}^{27} x_j \right] < \sum_{j=28}^{36} x_j \end{cases} \quad (3.2)$$

If either of the four $\sum x_j$ is equal, that is, there is a conflict in determining a definite learning style for the learner, then a simple heuristic approach will be used to determine l_q's learning preference.

3.3 Content Development Model

In order to make e-learning content less expensive to produce and portable across different hardware and software systems, a new way of developing e-learning content has been proposed. This new approach assumes that e-learning content can be organized and disseminated in a uniform format as small chunks of learning materials commonly referred to as learning objects or knowledge objects, Clayton (2000); Feemster (2000). It seems that developing and delivering learning content as objects will promote re-usability, inter-operability and content-sharing between different training vendors and

educational institutions. When combined, the learning objects, due to their reusability in different learning scenarios may form educational resources that can be used in different environments by different individuals.

Furthermore, each learning object must have a description that enables learners to search for and find the right objects for the right topic (Figure. 3.1). This implies that objects must be wrapped in metadata. Metadata is known as "structured data about data". The term metadata has become particularly common with the popularity of the web. The purpose of metadata is to provide a common way to describe resources so that they can be self-defined and searched, Gerber (2001). The first organization dedicated to promoting the widespread adoption of interoperable metadata standards is Dublin Core Metadata Initiative (DCMI). They developed a set of simple specialized metadata vocabularies for describing resources that enable more intelligent information discovery systems on the internet. Nowadays, many web sites adopt DCMI to describe their web pages.

However, in a personalised e-learning system, DCMI is too simple to support effective resource discovery. It lacks the elements that may be used to describe the educational features of learning objects. Therefore, a number of organizations, such as instructional management system (IMS), and advanced distributed learning (ADL) developed a new metadata standard for learning objects. This metadata standard was adopted for representing each of the t_l or s_{lm} learning object in a creative way.

Each t_l or s_{lm} learning object of the course c_{ik} has to be developed to introduce activities that are suitable for the four Honey and Mumford learning styles. The same (or similar) core material is used for all the four learner types and each content is supplemented with different learning attributes such as activities, tasks and links to additional information to cater for the learners with different learning styles. Therefore, instead of developing four bespoke t_l or s_{lm}, the reuse of content (core material) was encouraged and once this was developed the learning objects suitable for the four learning styles augmented this.

Throughout the course c_{ik} the activist is only presented with a small amount of theory and content. Activists enjoy a wide range of different activities. The activist must go and research a particular topic and complete tasks based on this research. The emphasis for the activist material is to allow them to search for particular solutions to problems rather than presenting all solutions to them in a didactic manner. The theoretical side to the content is kept to a minimum with emphasis on activity rather than theory.

Reflectors learn best when they are allowed to ponder over activities. The course has to be designed to take this into consideration. Throughout each topic or subtopic s_{ik}, reflectors are presented with short activities where they must consider what the appropriate solution would be. For example, half-way through each topic or subtopic of the course they are provided with a link to a webpage and asked if they can identify further features that the subtopic s_{ik} is emphasizing. On the page following this activity a list of possible features are provided with short explanations to provide the reflector with some extra information to reflect on. This technique of asking a question and providing ideas for a solution is employed quite often throughout the reflector's course. Reflectors

like to stand back from events and observe. Because reflectors enjoys carrying out research they are encouraged to refer to the reading topics for further reading material along with being provided links to various external world wide web pages throughout the course.

Theorists enjoy being intellectually stretched. Their course tends to be the most theoretical of all the four courses. Because the pragmatist wants to know the reason why they study, it is important to link the content of the course to real world situations. Similar to the activist, the pragmatist will enjoy the practical aspect of researching material and this is catered for through the provision of tasks with links to web pages where solutions can be found.

Pragmatists enjoy being shown techniques that have obvious practical advantages. The facts stated above were taken into consideration when designing each t_l or s_{lm} learning object for different learners. The summary of this learning attributes are depicted in Table 3.2.

Learning Style	**Attribute1 (Content)**	**Attribute2 (Example)**	**Attribute3 (Activities)**	**Attribute4 (Keynotes)**	**Attribute5 (Summary)**	**Attribute6 (Assignment)**	**Attribute7 (Reference)**
Activist	Small	Many	Many	Needed	Needed	Many	Many
Reflector	Many (reflective)	Few	Short	Needed	Needed	Few	Many
Theorist	Large	Few	Few	Needed	-	Few	Needed
Pragmatist	Small	Many (practical)	Many	Needed	Needed	Many	Many

Table 3.2: Learning Style Attributes Description

3.4 Modeling and Design Architecture of the System

The Unified Modeling Language (UML) was used to depict and model some of the functionalities in the application. The UML is a visual language that provides a means to visualising construct and documents the artifacts of software system, Bennett, Skelton and Lunn (2005). The sequence diagram for accessing information in the application is contained in Figure 3.2.

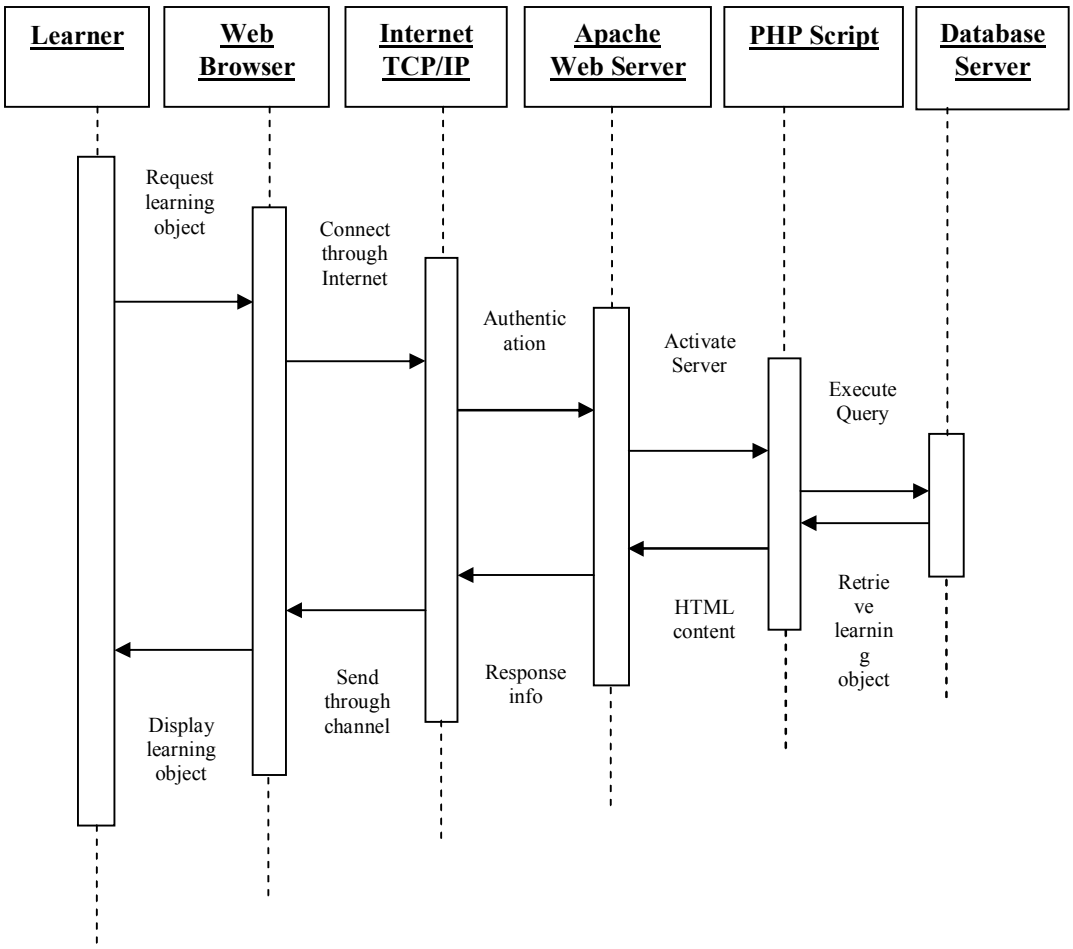


Figure 3.2: Sequence diagram for access to the system

The architecture presented allows easy access to learning objects in a personalised manner from any point in real-time using computers that are connected to a network (Internet/Intranet). Furthermore, a three-tier client-server architecture for the software development as shown in Figure 3.3

3.4.1 The software architecture for the web-based personalised e-learning system

The personalised e-learning system architecture (Figure3.3) presents the main components which perform the functions of personalizing learning materials to meet individual learner's learning requirements.

The architecture is based on a 3-tier client – server architecture which comprises of the presentation layer (user interface), the middleware (server and application services) and the data layer (databases). The database is separated from the client by the middleware. The middleware concept helps to improve scalability, load balancing transactional processing and interoperability issues by providing a means that allows for non-propriety/multi-platform adaptive personalised learning services.

3.4.1.1 Presentation Layer

The presentation layer which comprises of access portal and authentication, selection of learning object and pre-test perform the functions that allow learners to interact with the system by giving or obtaining information through their use.

3.4.1.2 Middleware

The middleware contains most of the application logic and translates learners' requests into database queries and other actions and translate the query results to learning objects on learner mobile devices. The applications supported by this middleware are personalised learning program, user monitoring, learning object creation and update, knowledge route agent, learner profile creation and update and matching service. Learners access the application from various computers within an institution and its environs that have network coverage. Once a learner has been authenticated and pre-tested, he can access learning objects in a manner suitable to his/her learning style. The client application interfaces to the application layer using TCP/IP. The information from the database is presented in a compatible form to the browser by the use of HTML (Hyper-Text Mark-up language) Ikuomoregbe, Ehikioya and Ayo (2007).

3.4.1.3 Data Layer

The data layer is responsible for the storage, retrieval, maintenance and integrity of the data manipulated within the system. Though MySQL was used in this thesis for the implementation of the data layer, the architecture presented in fig 3.3, could allow other databases such as Microsofts SQL/SQL stored procedures, and oracle database to be implemented. Stored procedures are complex queries stored in a compiled form inside the database, which can be executed by the database management system (DBMS) on the server side to enhance the robustness and reliability of the system, Lamberti, Montrucchio, Sanna and Zunino (2003).

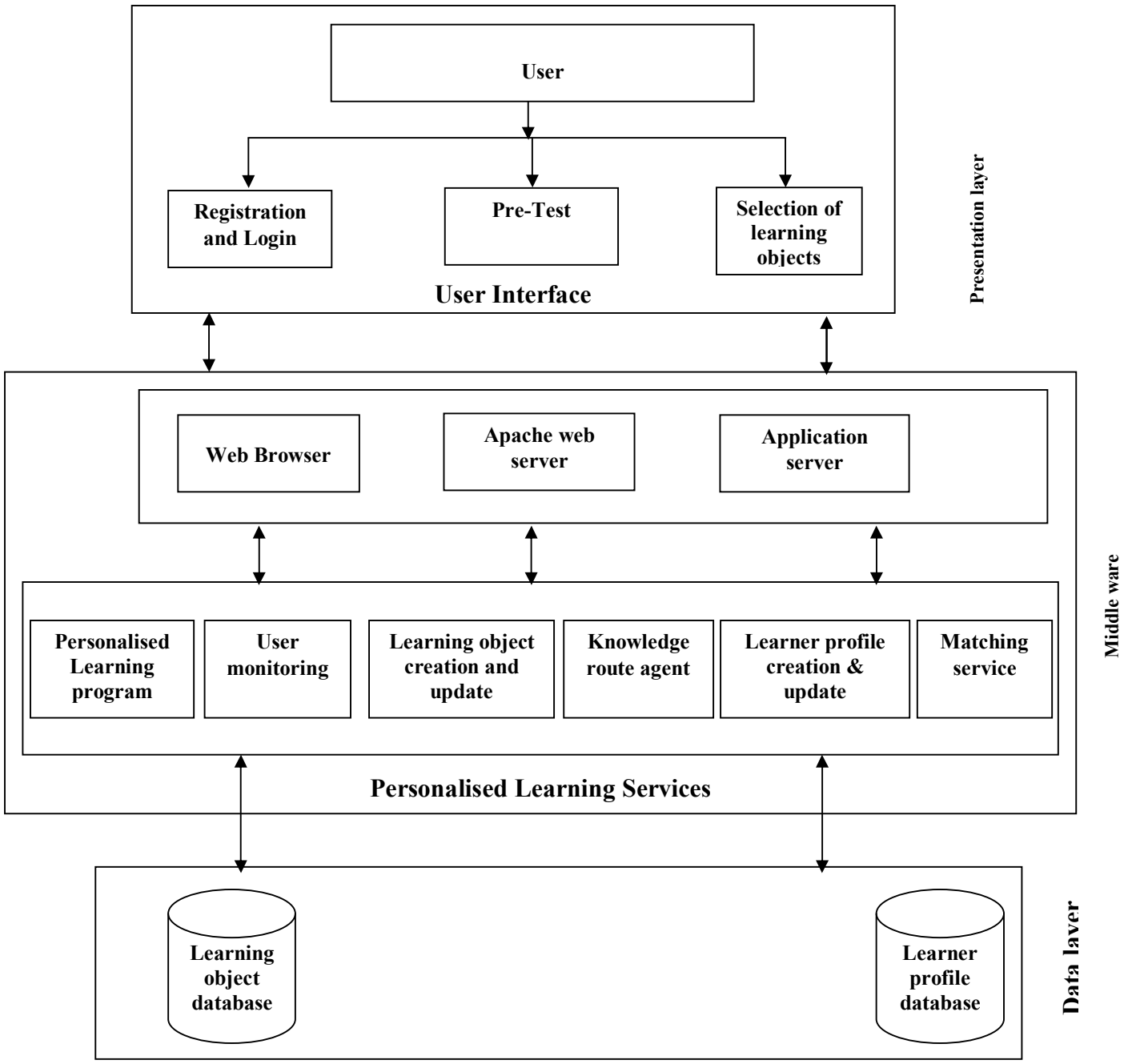


Figure 3.3: 3-Tier Client-Server Software Architecture of the web-based personalised e-learning system

3.4.2 Component Communication and Data Flow Model

The interaction between the system components and services are depicted in Figure 3.4.

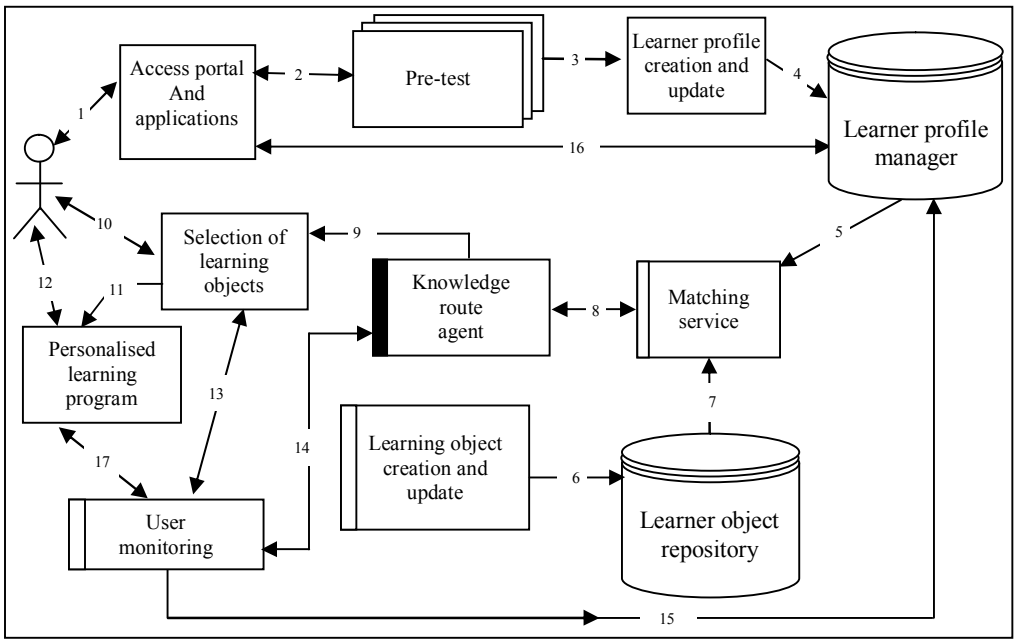


Figure 3.4: Component Communication and Data Flow Model of the web-based personalised e-learning system – source Adewale (2007).

In Figure 3.4, both *access portal and application*, *selection of learning objects* and *personalised learning program* perform the functions that allow learners to interact with the system by giving or obtaining information through their use. The web-based personalised e-learning system builds a learner's profile based on a combination of both their learning styles and prior-knowledge. Thirty-six questions were used to identify the individual learner's learning style and to assess his prior knowledge for formulating parameters for the optimization algorithms in *marching service*. There are two main steps to carry out the analysis process. The first step involves a design of questionnaires by which the learner's learning preference can be identified. In

addition to having learners with strong activist, theorist, reflector, or pragmatist learning style; there is also the possibility of having learners with a mixture of learning style or learning preferences or possibility of learners developing their weaker learning styles. For instance, a number of learner features were required to provide feedback and to facilitate learner empowerment. This is possible through the decision that the learner should be allowed to re-compile the course based on any selected learning style. For example, after completing the learning style questionnaire the learner may be classified as an activist and is therefore presented with the activist course. However, this learner may be interested in developing his theorist skills and may wish to be presented with the theorist course. To facilitate this type of learner empowerment an option is included to allow the learner to re-compile the course based on a selected learning style.

After proper authentication via *access portal and application*, *pre-test* composes a pre-test which is used at the beginning of the learning process in order to identify the learners' preferences. The *pre-test* consists of a set of questionnaires. The questionnaires are used for determining learners' style via Equation (3.2). Results from the *pre-test* will indicate the type of learner and his level of prior-knowledge of the course. This information constitutes the basis of each learner's profile which is stored in *learner profile manager* database and will be used subsequently by the *matching service* to provide personalised materials to each learner. On the other hand, if a learner's preference is found in *learner profile manager* database after proper authentication and the learner is not willing to change his learning style, this preference will be extracted from *learner profile manager* database and will be used

subsequently by the *marching service* to provide personalised learning materials for the learner.

The *matching service* retrieves a specific learner's profile from *learner profile manager* database and carries out a mapping procedure. The results of this process will determine a selection of learning objects from the *learning object repository* and their sequencing for the personalised learning package. The *knowledge route agent* basically is a piece of software which receives the matching outcome from *matching service* and manages the current knowledge path of the learner. This architecture provides the software environment for learners to interact with their learning process and materials that allow them to engage learning with their learning experiences. All types of learners are supported according to their learning styles and prior knowledge.

These knowledge routes are presented according to different learners' profiles. This set of information will be used by *user monitoring* for monitoring the learner's participation against the learning outcomes. An adequate support to individual learner can be provided at the right time. Furthermore, this information can be used to generate learning patterns which will improve the instructional design on personalised learning materials.

Although, this system concentrates on mechanisms to provide greater personalization for the learner, a means is also provided to facilitate the development of a learner's weaker learning style. Feedback pertaining to the learner's learning style as determined through the learning style questionnaire is given to the learner. A learner,

after receiving feedback showing strong tendencies towards the activist learning style, may wish the course to be re-compiled as if his preferred learning style is in fact theorist. Empowering the learner to carry out such an action provides him/her a mechanism to develop his/her weaker learning style and assists him in becoming a more versatile learner with a full range of learning capabilities rather than simply matching instruction to existing learning styles.

3.5 Database Model

A database is a collection of data. Database in general includes data in all forms such as texts, manuscripts, documents, books, and video clips in addition to data stored on computer, Adewale (2006b).

Database model is the concept used to describe the structure or arrangement of data in a database. Database models include: Relational database model, hierarchical database model, network database model and object-oriented database model.

The web-based personalised e-learning system database is designed on the relational database model with the scripting code (PHP codes) being used to generate request from user to the database system and return result of the request through the web server to the user. The database is made up of a collection of seven relations, where each relation is a table with rows and columns. Each relation consists of a relation schema and a relation instance. The relation instance is the table and the relation schema describes the column heads for the table.

Each relation schema specifies the relation's name, the name of each field or attribute or column and the domain of each field. The systems database has a relation schema as follows:

Student_Table [*student_id, surname, firstname, othernames, sex, level, email, phone_number, grade*],

Tutor_Table [*tutor_id, surname, firstname, othernames, sex, email, phone_number, rank*],

Course_Table [*course_id, course_title, course_content*],

Learningstyle_Table [*style_id, title*]

The outlined entities set above are represented in an entity-relationship (E-R) diagram as shown in figure 3.5.

Figure 3.5: Entity-Relationship Diagram of the web-based personalized e-learning system.

Chapter Four
Systems Requirement and Implementation

4.1 System Requirement

The minimum hardware requirement for the effective development and implementation of this system are as follows:

a. A Pentium IV CPU, 1.8 GHz processor with 512MB memory

b. A 40 GB hard drive capacity

c. A graphic adaptor with screen resolution of 800 x 600 pixels and 32 bit quality

d. A CD/DVD Rewritable drive

e. Internet ready with 56kb modem for dial-up access

f. Wireless LAN with 802.11b/g wireless network card

g. 10/100 Mbps Ethernet LAN card

h. Sound Card and Multimedia speakers

The minimum software requirement for the effective development and implementation of this system are as follows:

a. Apache Wamp Server version 2.2.8

b. MySQL database server version 5.0.51a

c. PHP server side scripting language version 5.2.5

4.2 System Technology

Implementing the Web-based Personalised e-Learning System involved the integration of web technology, database technology, and programming technology, using open source solution (Apache, MySQL, and PHP) running on Windows XP operating system. The technological tools are chosen because of their enormous advantages over other platforms as attested by Elizabeth, Jason, and Jeremy (2005), Elizabeth, Jason, and Jeremy opined that open source programs are better because:

a. they are free,

b. they are cross-platform and 'technology neutral',

c. they must not restrict other software, and

d. they embrace diversity.

The version of Apache used for the system is 2.2.8, with features for password-protected pages for a multiple of users, customized error pages, virtual hosting for different IP addresses mapped to the same server, directory index directive to multiple files and many more. According to Netcraft web site (www.netcraft.com), it is a popular choice because of its flexibility, power, and price.

PHP 5.2.5 is the version used for the development of the system. It is a server-side scripting language that makes our web site to be truly dynamic. It contains numerous built-in functions with flexibility and relatively small learning curve, making it one of the most popular scripting languages around. It is now preferred as an alternative to Microsoft ASP language and Perl, Elizabeth, Jason and Jeremy (2005).

MySQL 5.0.51a is the version used for the development of the system. It is the database construct that enables PHP and Apache to work together to access and display data in a readable format to a browser. MySQL according to Elizabeth, Jason, and Jeremy (2005) is the perfect choice for providing data via the internet because of its ability to handle heavy loads and its advanced security measures.

The web-based personalised e-learning system is built around a three-tier architecture model as shown in Figure 3.3.

4.3 System Implementation

The web-based personalised e-learning system was developed using all the technological tools described in 4.2 above, following the design structures described earlier in chapter 3. It consists of six modules – Personalised Learning, User Monitoring, Learning Object Creation and Update, Knowledge Route Agent, Learner Profile Creation, and Update and Matching Service, as described in section 3.4.2. The system also comprises of the following Graphical User Interfaces (GUI) as outlined below. Home, Tutor Login, Tutor Registration, Add Learning Material, Edit Learning Material, Students Login, Student Registration, Pre-Test, View Learning Material, Help and Support, and Contact Us.

4.3.1 Home Page

The Home Page as shown in Figure 4.1 is a PHP form with no input field. It contains a brief description of the Personalised Web-base e-Learning System as well as some menu buttons that will take the system user to other parts of the system.

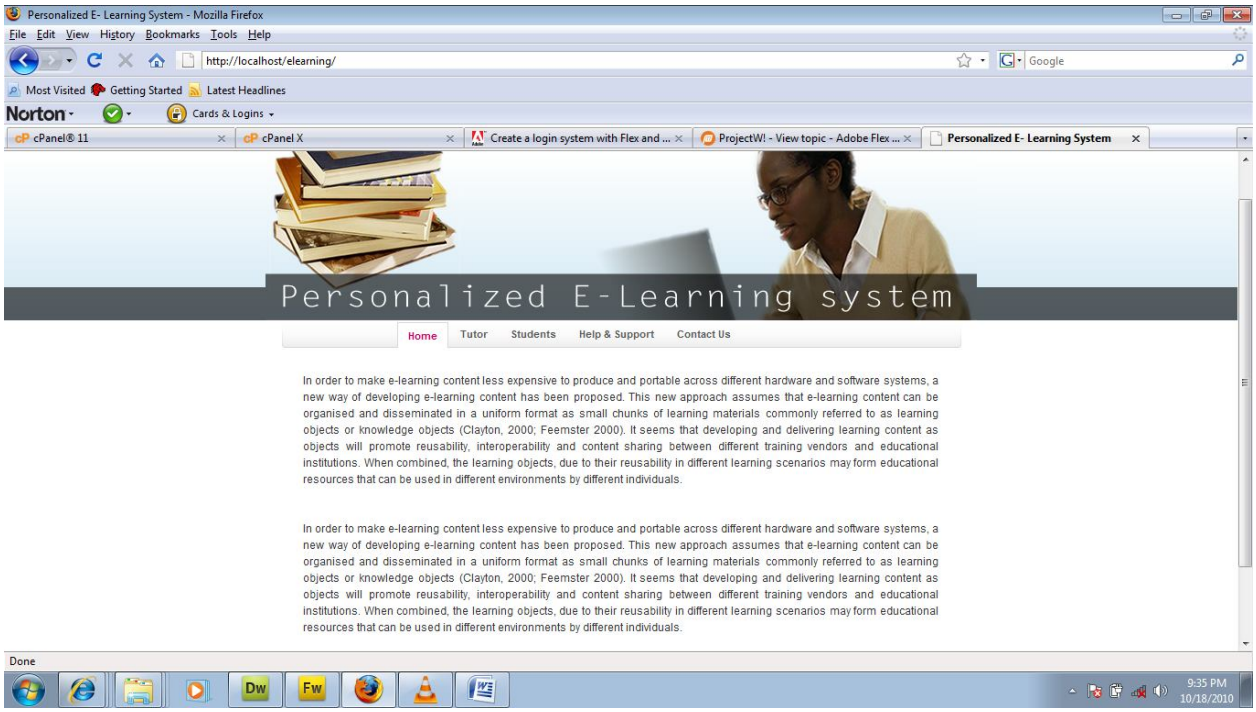


Figure 4.1 Home Page

4.3.2 Tutor login

The Tutor Login page as shown in Figure 4.2 is a form with two textboxes and a login button for input data. It collects the Tutor ID and password for registered tutors and allows them to login and create or edit learning content.

4.3.3 Tutor Registration

The Tutor Registration page as shown in Figure 4.3 is a form with textboxes and a register button for input data. It collects the tutor's relevant particulars, it is used to assign Tutor ID and Password for new tutors who can now use their profile to login and create or edit learning content.

4.3.4 Student login

The Students Login page as shown in Figure 4.4 is a form with two textboxes and a login button for input data. It collects the Students ID and Password for registered students and allows them to login and view learning content.

4.3.5 Student Registration

The Student's Registration page as shown in Figure 4.5 is a form with textboxes and a submit button for input data. It collects the student's relevant particulars and is also used to assign student's ID and Password for new students after which they will be directed to take the pre-test.

4.3.6 Pre-Test

The Pre-Test page as shown in Figure 4.6 is a form with Thirty six questions and four radio buttons to each question that the student's have to answer. The system uses their response to the questions to profile in order to determine their individual learning style. On clicking the submit button on this page, the system will generate and log the learner learning style and use it whenever the student logs in again to extract learning material for him/her.

4.3.7 Add Learning Materials

The Add Learning Material page as shown in Figure 4.7 is used by the tutor to create and add bits of learning contents to the system for access in a manner that suits the students' learning styles.

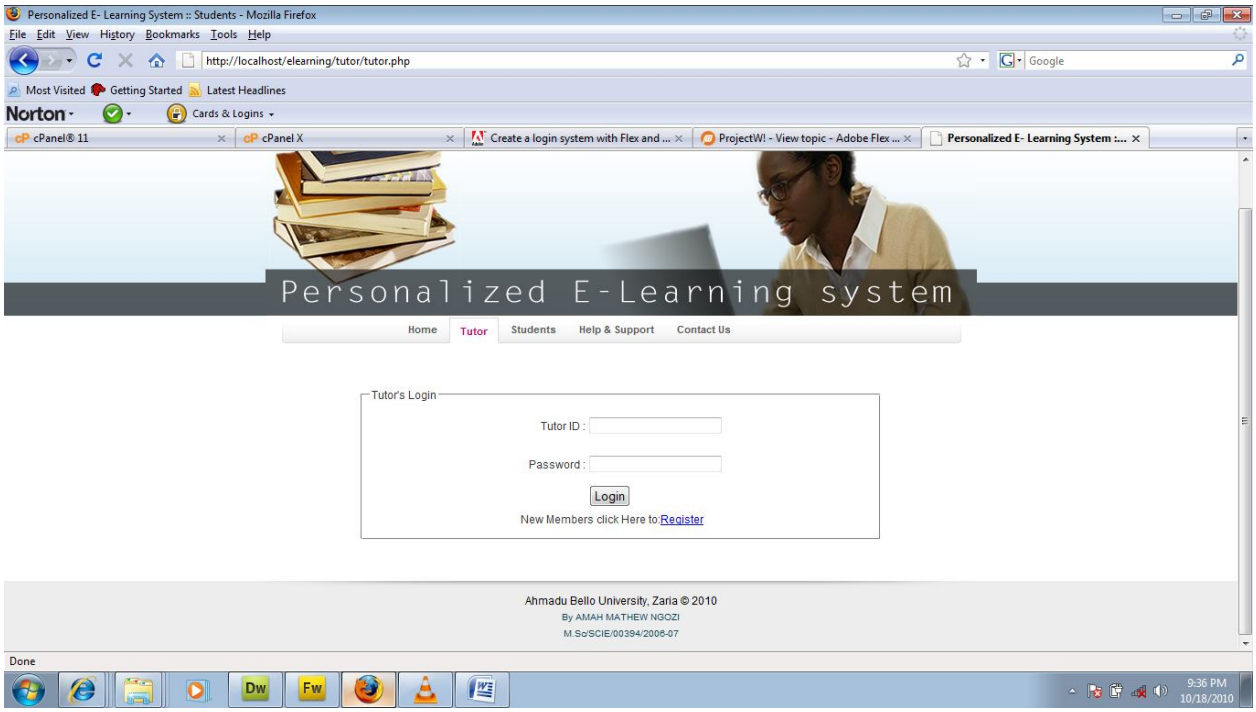


Figure 4.2 Tutor Login Page

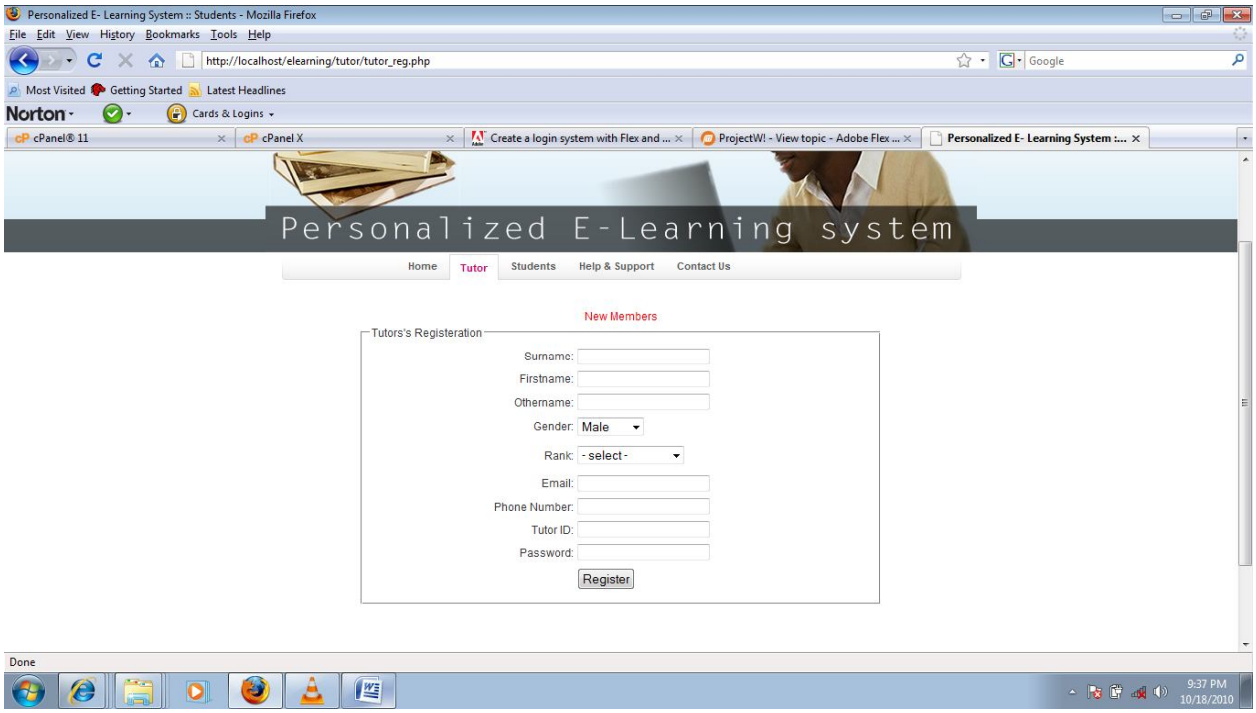


Figure 4.3 Tutor Registration Page

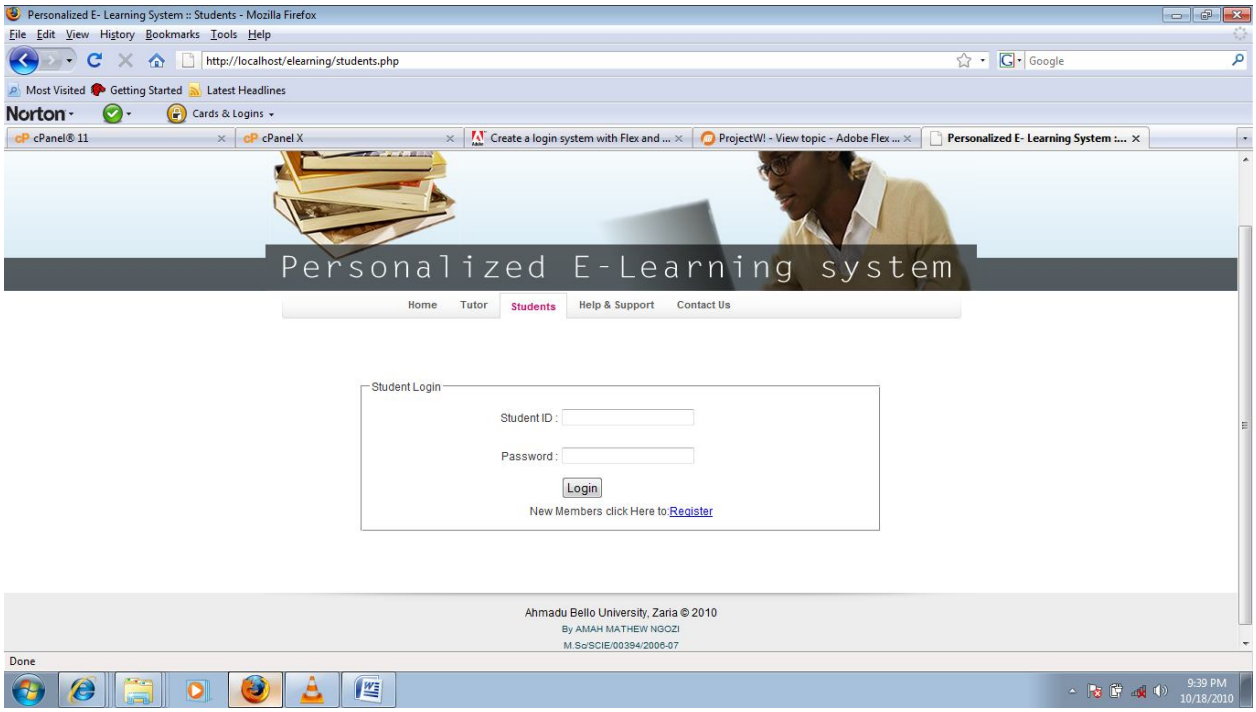


Figure 4.4 Students' Login page

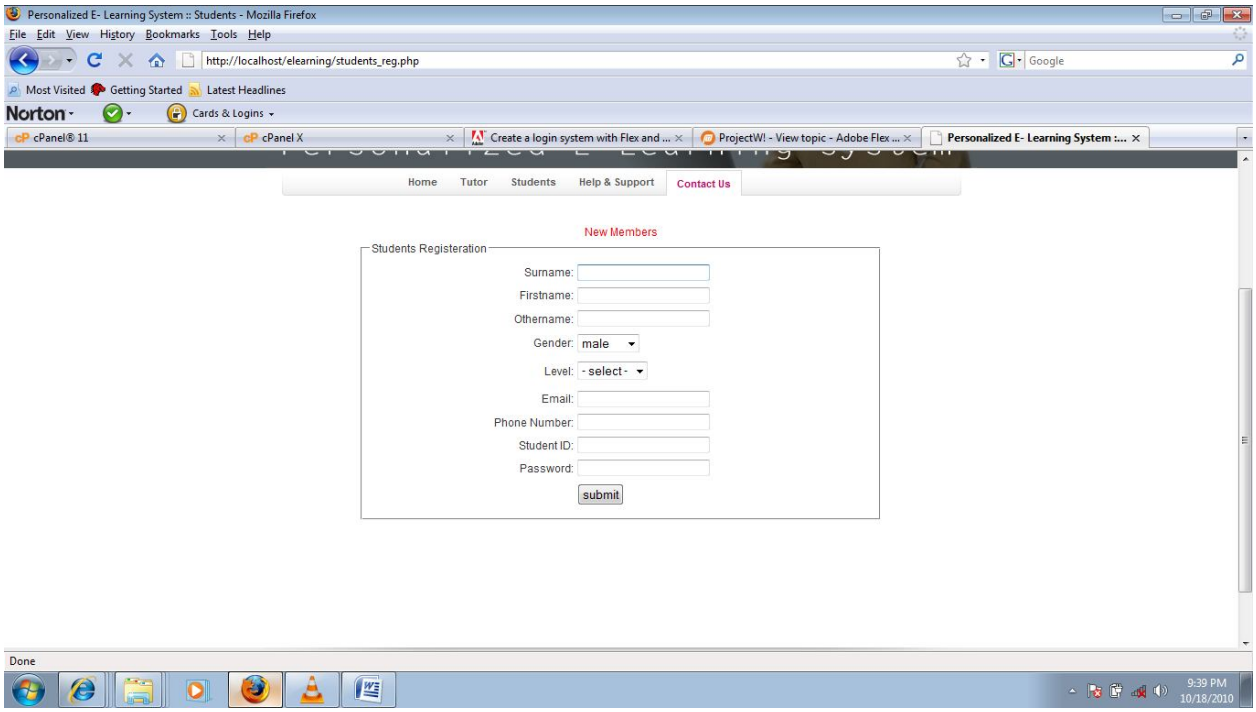


Figure 4.5 Students' Registration Page

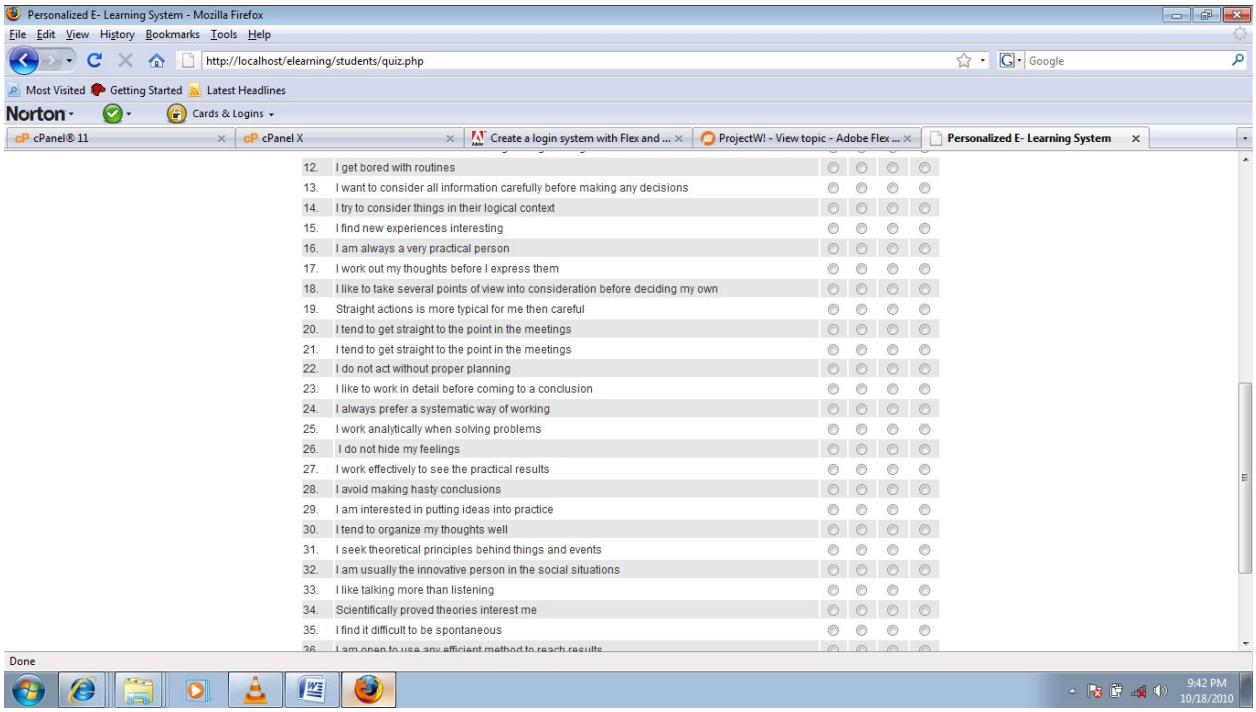


Figure 4.6 Pre-Test Page for Determining Students' Learing Style.

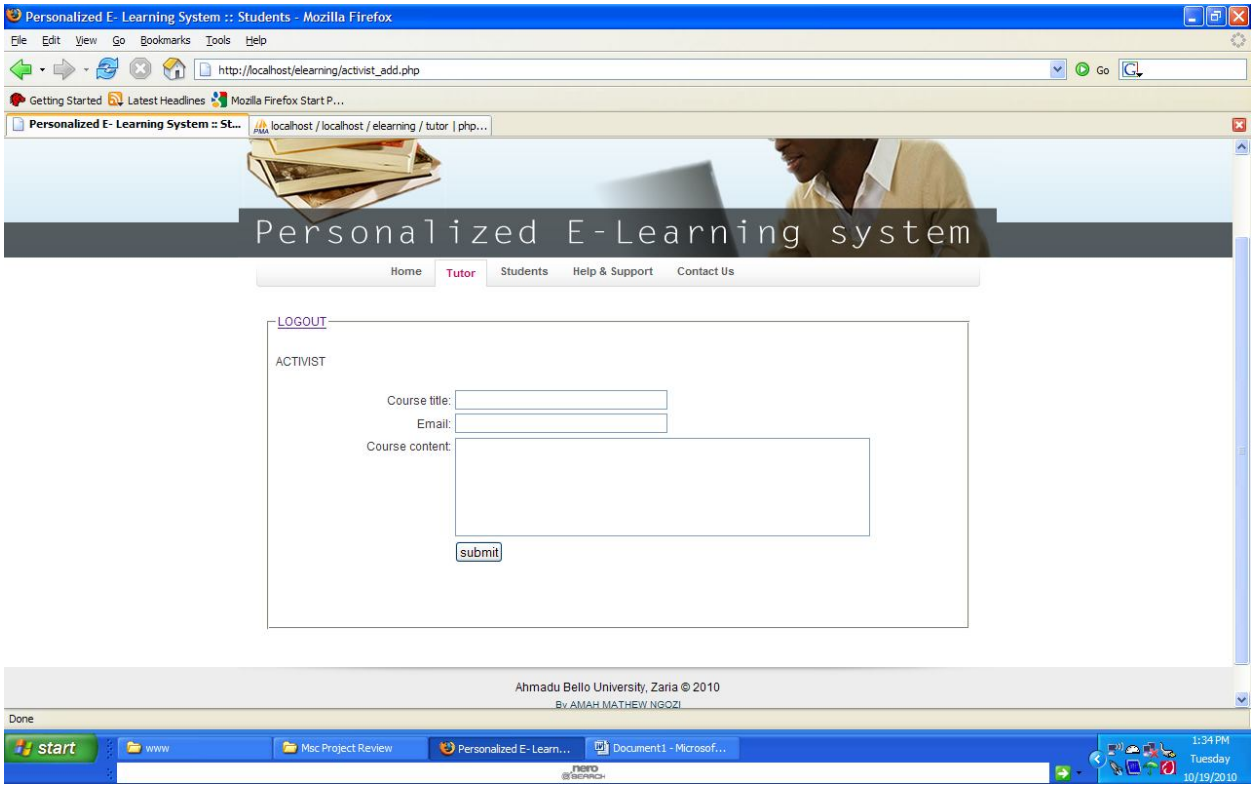


Figure 4.7 Add Learning Material Page

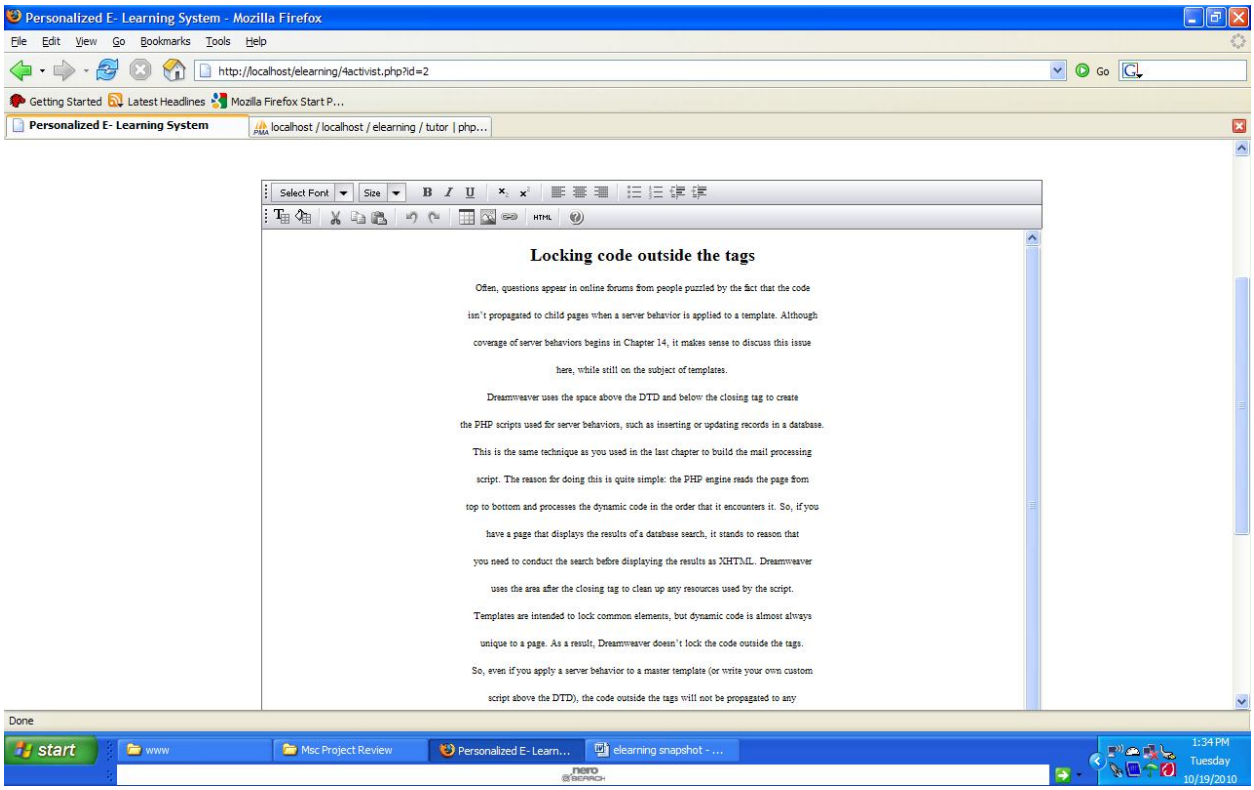


Figure 4.8 Edit Learning Material Page

4.3.8 Edit Learning Material

The Edit Learning Material page as shown in Figure 4.8 is used by the tutors only to alter and ammend learning contents already in the system as the need arises.

Chapter Five

Summary, Conclusion and Recommendations

5.1 Summary

This research work involved the study and overview of e-learning and the evolving trends of its implementation in the teaching and learning process. It further made a case for the student-centered paradigm shift towards instruction, with active, collaborative, and personalised learning as key principles based on the client-centered philosophy of business. In exploring this paradigm shift, different learning theories and their associated learning styles were surveyed. The cognitivisim learning theory and the Honey and Mumford learning style classification was then adopted for this work due to there correlation to the way computers process and relay information. A personalised e-learning model was developed and finally implemented as a web-based system using Apache as web server, PHP as the server-side scripting language, HTML as client-side scripting language and MySQL as the relational database.

5.2 Conclusion

This thesis presented a formal description of personalised e-learning system, a pedagogically sound approach to adaptively composing and personalizing the access of learning contents in tertiary institutions. A mathematical model for the profiling of learners to determine their learning style based on the Honey and Mumford LSQ was also presented. Based on the mathematical model, the software architecture for the Web-based Personalised E-Learning System was designed using the three tier client-server systems architecture. In so doing it presented the main components of the model performing the

functions of personalised learning materials to meet individual learner's learning requirements based on their learning style.

Finally, the architectural design was implemented using the Apache WapmServer, MySQL, and PHP web technology tools.

5.3 Recommendations

To successfully integrate this system into the teaching and learning process, the thesis puts forward the following recommendations:

a. The need for the provision of a well-maintained computer network infrastructure in the tertiary institutions that will allow tutors and learners to easily compose and access learning contents.
b. Learners should be encouraged to acquire portable personal computers in order to avail themselves of this new technology to improve their personal study habits.
c. Seminars and workshops should be organized for tutors and learners to sensitize them on how to efficiently utilize the system.

5.5 Further Research

To increase the level of automation of the system, it is suggested that further research be carried out on how to integrate the technology of ontology and semantic web to improve the searching and personalization of learning contents from the web. It is also suggested that further research be conducted on how to make the system available on mobile devices to increase the ubiquity of its use.

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APPENDIX A

Source Code Listing

Home page

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />
<title>Personalized E- Learning System</title>
<link href="style.css" rel="stylesheet" type="text/css" />
</head>

<body>
        <div id="header">
          </div>
<div id="topNav">
                    <ul>
                              <li><a href="" title="Home" class="hover">Home</a></li>
                              <li><a href="tutor/tutor.php" title="Tutor">Tutor</a></li>
                              <li><a href="students.php" title="Students">Students</a></li>
                              <li><a href="support.php" title="Help & Support">Help & Support</a></li>
                              <li><a href="contact.php" title="Contact">Contact Us</a></li>
                    </ul>
 <p> </p>
                    <p> </p>
                    <p> </p>
</div>
<div id="body">
 <form id="quiz" name="quiz" method="post" action="students/process.php">
  <table width="95%" border="0" align="center">
    <tr>
      <td colspan="6" align="center" valign="top"><p align="justify"> In order to make  e-learning content
less expensive to produce and portable across different  hardware and software systems, a new way of
developing e-learning content has  been proposed. This new approach assumes that e-learning content can
be  organised and disseminated in a uniform format as small chunks of learning  materials commonly
referred to as learning objects or knowledge objects  (Clayton, 2000; Feemster 2000). It seems that
developing and delivering  learning content as objects will promote reusability, interoperability and
content sharing between different training vendors and educational  institutions. When combined, the
learning objects, due to their reusability in  different learning scenarios may form educational resources that
can be used in  different environments by different individuals.</p>
       <p align="justify"> </p>
      <p align="justify"> </p>
      <p align="justify">In order to make  e-learning content less expensive to produce and portable across
different  hardware and software systems, a new way of developing e-learning content has  been proposed.
This new approach assumes that e-learning content can be  organised and disseminated in a uniform format
as small chunks of learning  materials commonly referred to as learning objects or knowledge objects
(Clayton, 2000; Feemster 2000). It seems that developing and delivering  learning content as objects will
promote reusability, interoperability and  content sharing between different training vendors and
educational  institutions. When combined, the learning objects, due to their reusability in  different learning
scenarios may form educational resources that can be used in  different environments by different
individuals.</p></td>
    </tr>
  </table>
  <p>
    <label></label>
```

```
   </p>
  </form>
</div>
            <div id="footer">
<div class="footer">
            <ul>
                                                <div align="center">Ahmadu Bello University, Zaria © 2010 </div>
            </ul>
            <p align="center">By AMAH MATHEW NGOZI<br />
M.Sc/SCIE/00394/2006-07</p>
</div>
</div>
</body>
</html>
```

Tutor Login

```
<?php require_once('../Connections/connection.php'); ?>
<?php
if (!function_exists("GetSQLValueString")) {
function GetSQLValueString($theValue, $theType, $theDefinedValue = "", $theNotDefinedValue = "")
{
  $theValue = get_magic_quotes_gpc() ? stripslashes($theValue) : $theValue;
  $theValue = function_exists("mysql_real_escape_string") ? mysql_real_escape_string($theValue) :
mysql_escape_string($theValue);
  switch ($theType) {
    case "text":
      $theValue = ($theValue != "") ? "'" . $theValue . "'" : "NULL";
      break;
    case "long":
    case "int":
      $theValue = ($theValue != "") ? intval($theValue) : "NULL";
      break;
    case "double":
      $theValue = ($theValue != "") ? "'" . doubleval($theValue) . "'" : "NULL";
      break;
    case "date":
      $theValue = ($theValue != "") ? "'" . $theValue . "'" : "NULL";
      break;
    case "defined":
      $theValue = ($theValue != "") ? $theDefinedValue : $theNotDefinedValue;
      break;
  }
  return $theValue;
}
}
?>
<?php
// *** Validate request to login to this site.
if (!isset($_SESSION)) {
  session_start();
}
$loginFormAction = $_SERVER['PHP_SELF'];
if (isset($_GET['accesscheck'])) {
  $_SESSION['PrevUrl'] = $_GET['accesscheck'];
}
if (isset($_POST['tutor_id'])) {
  $loginUsername=$_POST['tutor_id'];
  $password=$_POST['password'];
```

```
  $MM_fldUserAuthorization = "";
  $MM_redirectLoginSuccess = "tutor_loginsuccess.php";
  $MM_redirectLoginFailed = "tutor_loginfailure.php";
  $MM_redirecttoReferrer = false;
  mysql_select_db($database_connection, $connection);
  $LoginRS__query=sprintf("SELECT tutor_id, password FROM tutor WHERE tutor_id=%s AND
password=%s",
    GetSQLValueString($loginUsername, "text"), GetSQLValueString($password, "text"));
  $LoginRS = mysql_query($LoginRS__query, $connection) or die(mysql_error());
  $loginFoundUser = mysql_num_rows($LoginRS);
  if ($loginFoundUser) {
     $loginStrGroup = "";
    //declare two session variables and assign them
    $_SESSION['MM_Username'] = $loginUsername;
    $_SESSION['MM_UserGroup'] = $loginStrGroup;
    if (isset($_SESSION['PrevUrl']) && false) {
      $MM_redirectLoginSuccess = $_SESSION['PrevUrl'];
    }
    header("Location: " . $MM_redirectLoginSuccess );
  }
  else {
    header("Location: ". $MM_redirectLoginFailed );
  }
}
?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />
<title>Personalized E- Learning System :: Students</title>
<link href="../style.css" rel="stylesheet" type="text/css" />
<style type="text/css">
<!--
.style1 {color: #FF0000}
-->
</style>
</head>
<body>
            <div id="header">              </div>
            <div id="topNav">
      <ul>
        <li><a href="" title="Home">Home</a></li>
        <li><a href="tutor.php" title="Tutor" class="hover">Tutor</a></li>
        <li><a href="../students.php" title="Students">Students</a></li>
        <li><a href="../support.php" title="Help &amp; Support">Help &amp; Support</a></li>
        <li><a href="../contact.php" title="Contact">Contact Us</a></li>
      </ul>
              <p> </p>
              <p> </p>
              <p> </p>
</div>
<div id="body">
  <table width="95%" border="0" align="center">
    <tr>
      <td height="198" colspan="6" valign="top"><table width="579" height="136" border="0"
align="center">
```

```
      <tr>
        <td height="132" align="center" valign="top"><p class="hover style1"> </p>
          <form id="tutor_login" name="tutor_login" method="POST" action="<?php echo
$loginFormAction; ?>">
          <fieldset>
            <legend>Tutor's Login</legend>
            <table width="226" border="0">
              <tr>
                <td width="75" height="39" align="right">Tutor ID :</td>
                <td width="141"><label>
                  <input type="text" name="tutor_id" id="tutor_id" />
                </label></td>
              </tr>
              <tr>
                <td height="40" align="right">Password : </td>
                <td><input type="password" name="password" id="password" /></td>
              </tr>
              <tr>
                <td> </td>
                <td><label>
                  <input type="submit" name="button" id="button" value="Login" />
                </label></td>
              </tr>
              <tr>
                <td colspan="2">New Members click Here to:<a href="tutor_reg.php">Register</a></td>
                </tr>
                      </table>
            </fieldset>
          </form>          </td>
        </tr>
      </table></td>
    </tr>
  </table>
</div>
            <div id="footer">
<div class="footer">
            <ul>
                                                <div align="center">Ahmadu Bello University, Zaria © 2010 </div>
            </ul>
            <p align="center">By AMAH MATHEW NGOZI<br />
M.Sc/SCIE/00394/2006-07</p>
</div>
</div>
</body>
</html>
```

Tutor REG

```
<?php require_once('../Connections/connection.php'); ?>
<?php
if (!function_exists("GetSQLValueString")) {
function GetSQLValueString($theValue, $theType, $theDefinedValue = "", $theNotDefinedValue = "")
{
  $theValue = get_magic_quotes_gpc() ? stripslashes($theValue) : $theValue;
  $theValue = function_exists("mysql_real_escape_string") ? mysql_real_escape_string($theValue) :
mysql_escape_string($theValue);
  switch ($theType) {
    case "text":
      $theValue = ($theValue != "") ? "'" . $theValue . "'" : "NULL";
```

```
      break;
    case "long":
    case "int":
      $theValue = ($theValue != "") ? intval($theValue) : "NULL";
      break;
    case "double":
      $theValue = ($theValue != "") ? "'" . doubleval($theValue) . "'" : "NULL";
      break;
    case "date":
      $theValue = ($theValue != "") ? "'" . $theValue . "'" : "NULL";
      break;
    case "defined":
      $theValue = ($theValue != "") ? $theDefinedValue : $theNotDefinedValue;
      break;
  }
  return $theValue;
}
}
$editFormAction = $_SERVER['PHP_SELF'];
if (isset($_SERVER['QUERY_STRING'])) {
  $editFormAction .= "?" . htmlentities($_SERVER['QUERY_STRING']);
}
if ((isset($_POST["MM_insert"])) && ($_POST["MM_insert"] == "tutor_register")) {
  $insertSQL = sprintf("INSERT INTO tutor (surname, firstname, othername, sex, email, mobile, rank,
tutor_id, password) VALUES (%s, %s, %s, %s, %s, %s, %s, %s, %s)",
                       GetSQLValueString($_POST['surname'], "text"),
                       GetSQLValueString($_POST['firstname'], "text"),
                       GetSQLValueString($_POST['others'], "text"),
                       GetSQLValueString($_POST['sex'], "text"),
                       GetSQLValueString($_POST['email'], "text"),
                       GetSQLValueString($_POST['mobile'], "text"),
                       GetSQLValueString($_POST['rank'], "text"),
                       GetSQLValueString($_POST['tutor_id'], "text"),
                       GetSQLValueString($_POST['password'], "text"));
  mysql_select_db($database_connection, $connection);
  $Result1 = mysql_query($insertSQL, $connection) or die(mysql_error());
  $insertGoTo = "tutor_regsuccess.php";
  if (isset($_SERVER['QUERY_STRING'])) {
    $insertGoTo .= (strpos($insertGoTo, '?')) ? "&" : "?";
    $insertGoTo .= $_SERVER['QUERY_STRING'];
  }
  header(sprintf("Location: %s", $insertGoTo));
}
?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />
<title>Personalized E- Learning System :: Students</title>
<link href="../style.css" rel="stylesheet" type="text/css" />
<style type="text/css">
<!--
.style1 {color: #FF0000}
-->
</style>
</head>
```

```
<body>
        <div id="header">            </div>
        <div id="topNav">
    <ul>
      <li><a href="" title="Home">Home</a></li>
      <li><a href="tutor.php" title="Tutor" class="hover">Tutor</a></li>
      <li><a href="../students.php" title="Students">Students</a></li>
      <li><a href="../support.php" title="Help &amp;amp; Support">Help &amp;amp; Support</a></li>
      <li><a href="../contact.php" title="Contact">Contact Us</a></li>
    </ul>
          <p> </p>
          <p> </p>
          <p> </p>
</div>
<div id="body">
  <table width="95%" border="0" align="center">
    <tr>
      <td height="380" colspan="6" valign="top"><table width="579" height="324" border="0"
align="center">
        <tr>
          <td height="320" align="center" valign="top"><form id="tutor_register" name="tutor_register"
method="POST" action="<?php echo $editFormAction; ?>">
          <p>
            <label for="firstname"></label>
            </p>
          <p><span class="style1">New Members            </span></p>
          <fieldset>
            <legend>Tutors's Registeration</legend>
            <table width="308" height="274" border="0">
              <tr>
                <td width="99" align="right">Surname: </td>
                <td width="199" align="left"><input type="text" name="surname"/></td>
                </tr>
              <tr>
                <td align="right">Firstname:</td>
                <td align="left"><input type="text" name="firstname"/></td>
                </tr>
              <tr>
                <td align="right">Othername:</td>
                <td align="left"><input type="text" name="others"/></td>
                </tr>
              <tr>
                <td align="right">Gender: </td>
                <td align="left"><select name="sex">
                  <option value="male" selected="selected" >Male</option>
                  <option value="female" >Female</option>
                  </select></td>
                </tr>
              <tr>
                <td height="34" align="right">Rank: </td>
                <td align="left"><select name="rank" id="rank">
                  <option selected="selected">- select -</option>
                  <option value="snr">Senior Lecturer</option>
                  <option value="jnr">Junior Lecturer</option>
                  </select></td>
                </tr>
              <tr>
```

```
            <td align="right">Email:</td>
            <td align="left"><input type="text" name="email"/></td>
            </tr>
           <tr>
            <td align="right"><p>Phone Number: </p></td>
            <td align="left"><input type="text" name="mobile"/></td>
            </tr>
           <tr>
            <td align="right">Tutor   ID: </td>
            <td align="left"><input type="text" name="tutor_id" id="tutor_id"/></td>
            </tr>
           <tr>
            <td align="right">Password: </td>
            <td align="left"><input type="password" name="password"/></td>
            </tr>
           <tr>
            <td align="right"> </td>
            <td align="left"><input type="submit" name="submit" id="submit" value="Register" /></td>
            </tr>
           </table>
         </fieldset>
        <p>
         <label for="radio"></label>
         </p>
        <input type="hidden" name="MM_insert" value="tutor_register" />
        </form></td>
      </tr>
    </table></td>
  </tr>
 </table>
</div>
          <div id="footer">
<div class="footer">
          <ul>
                                        <div align="center">Ahmadu Bello University, Zaria © 2010 </div>
          </ul>
          <p align="center">By AMAH MATHEW NGOZI<br />
M.Sc/SCIE/00394/2006-07</p>
</div>
</div>
</body>
</html>
```

QUIZ

```
<?php
session_start();
?>
<?php
if (isset($_POST['submit'])) {
$_SESSION['surname'] = $_POST['surname'];
$_SESSION['firstname'] =$_POST['firstname'];
$_SESSION['others'] =$_POST['others'];
$_SESSION['sex'] =$_POST['sex'];
$_SESSION['level'] =$_POST['level'];
$_SESSION['email'] =$_POST['email'];
$_SESSION['mobile'] =$_POST['mobile'];
$_SESSION['student_id'] =$_POST['student_id'];
$_SESSION['password'] =$_POST['password'];
```

```
}
?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />
<title>Personalized E- Learning System</title>
<link href="../style.css" rel="stylesheet" type="text/css" />
</head>
<body>
<div id="header"></div>
<div id="topNav">
                    <ul>
                            <li><a href="../index.php" title="Home">Home</a></li>
                            <li><a href="../tutor/tutor.php" title="Tutor">Tutor</a></li>
                            <li><a href="../students.php" title="Students" class="hover">Students</a></li>
                            <li><a href="../support.php" title="Help & Support">Help & Support</a></li>
                            <li><a href="../contact.php" title="Contact">Contact Us</a></li>
                    </ul>
  <p> </p>
                    <p> </p>
                    <p> </p>
</div>
<div id="body">
  <form id="quiz" name="quiz" method="post" action="process.php">
    <table width="95%" border="0" align="center">
      <tr bgcolor="#666600">
        <td height="21" colspan="6" align="center" bgcolor="#FFFFFF">Please Check the answer that Suite
Your Respnse .</td>
      </tr>
      <tr bgcolor="#666600">
        <td height="21" colspan="6" align="center" bgcolor="#FFFFFF">Note: TA =Totally Agree, PA =
Partially Agree, PD = partially Disagree TD = Totally Disagree</td>
      </tr>
      <tr bgcolor="#666600">
        <td bgcolor="#000000"><font color="#CC9900">S/N</font></td>
        <td height="21" bgcolor="#000000"><font color="#CC9900">QUESTIONS</font></td>
        <td align="center" bgcolor="#000000"><font color="#CC9900">TA</font></td>
        <td align="center" bgcolor="#000000"><font color="#CC9900">PA</font></td>
        <td align="center" bgcolor="#000000"><font color="#CC9900">PD</font></td>
        <td align="center" bgcolor="#000000"><font color="#CC9900">TD</font></td>
      </tr>
      <tr bgcolor="#FFFFFF">
        <td width="5%">1.</td>
        <td width="77%">I am eager to test new ideas in practice</td>
        <td align="center"><input type="radio" name="q1" value="3"/></td>
        <td align="center"><input type="radio" name="q1" value="2"/></td>
        <td align="center"><input type="radio" name="q1" value="1"/></td>
        <td align="center"><input type="radio" name="q1" value="0"/></td>
      </tr>
      <tr bgcolor="#00FFFF">
        <td bgcolor="#E7E7E7">2.</td>
        <td bgcolor="#E7E7E7">I like to plan my work properly</td>
        <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q2" value="3"/></td>
        <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q2" value="2"/></td>
        <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q2" value="1"/></td>
```

```
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q2" value="0"/></td>
</tr>
<tr bgcolor="#FFFFFF">
  <td>3.</td>
  <td>I do not believe in impulsive decisions</td>
  <td align="center"><input type="radio" name="q3" value="3"/></td>
  <td align="center"><input type="radio" name="q3" value="2"/></td>
  <td align="center"><input type="radio" name="q3" value="1"/></td>
  <td align="center"><input type="radio" name="q3" value="0"/></td>
</tr>
<tr bgcolor="#00FFFF">
  <td bgcolor="#E7E7E7">4.</td>
  <td bgcolor="#E7E7E7">I act spontaneously</td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q4" value="3"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q4" value="2"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q4" value="1"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q4" value="0"/></td>
</tr>
<tr bgcolor="#FFFFFF">
  <td>5.</td>
  <td>I believe mainly in practical facts</td>
  <td align="center"><input type="radio" name="q5" value="3"/></td>
  <td align="center"><input type="radio" name="q5" value="2"/></td>
  <td align="center"><input type="radio" name="q5" value="1"/></td>
  <td align="center"><input type="radio" name="q5" value="0"/></td>
</tr>
<tr bgcolor="#00FFFF">
  <td bgcolor="#E7E7E7">6.</td>
  <td bgcolor="#E7E7E7">I like the company of sociable people</td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q6" value="3"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q6" value="2"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q6" value="1"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q6" value="0"/></td>
</tr>
<tr bgcolor="#FFFFFF">
  <td>7.</td>
  <td>I want to see the connections between theory and  practice immediately</td>
  <td align="center"><input type="radio" name="q7" value="3"/></td>
  <td align="center"><input type="radio" name="q7" value="2"/></td>
  <td align="center"><input type="radio" name="q7" value="1"/></td>
  <td align="center"><input type="radio" name="q7" value="0"/></td>
</tr>
<tr bgcolor="#00FFFF">
  <td bgcolor="#E7E7E7">8.</td>
  <td bgcolor="#E7E7E7">I tend to rely on principles and theories</td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q8" value="3"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q8" value="2"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q8" value="1"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q8" value="0"/></td>
</tr>
<tr bgcolor="#FFFFFF">
  <td>9.</td>
  <td>I prefer having lots of drafts before making the  final version </td>
  <td align="center"><input type="radio" name="q9" value="3"/></td>
  <td align="center"><input type="radio" name="q9" value="2"/></td>
  <td align="center"><input type="radio" name="q9" value="1"/></td>
  <td align="center"><input type="radio" name="q9" value="0"/></td>
```

```
    </tr>
    <tr bgcolor="#00FFFF">
      <td bgcolor="#E7E7E7">10.</td>
      <td bgcolor="#E7E7E7">I usually say immediately what I think in order  to achieve results
quickly</td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q10" value="3"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q10" value="2"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q10" value="1"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q10" value="0"/></td>
    </tr>
    <tr bgcolor="#FFFFFF">
      <td>11.</td>
      <td>I do not comment before I&rsquo;ve thought things  through</td>
      <td align="center"><input type="radio" name="q11" value="3"/></td>
      <td align="center"><input type="radio" name="q11" value="2"/></td>
      <td align="center"><input type="radio" name="q11" value="1"/></td>
      <td align="center"><input type="radio" name="q11" value="0"/></td>
    </tr>
    <tr bgcolor="#00FFFF">
      <td bgcolor="#E7E7E7">12.</td>
      <td bgcolor="#E7E7E7">I get bored with routines </td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q12" value="3"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q12" value="2"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q12" value="1"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q12" value="0"/></td>
    </tr>
    <tr bgcolor="#FFFFFF">
      <td>13.</td>
      <td>I want to consider all information carefully  before making any decisions</td>
      <td align="center"><input type="radio" name="q13" value="3"/></td>
      <td align="center"><input type="radio" name="q13" value="2"/></td>
      <td align="center"><input type="radio" name="q13" value="1"/></td>
      <td align="center"><input type="radio" name="q13" value="0"/></td>
    </tr>
    <tr bgcolor="#00FFFF">
      <td bgcolor="#E7E7E7">14.</td>
      <td bgcolor="#E7E7E7">I try to consider things in their logical  context</td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q14" value="3"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q14" value="2"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q14" value="1"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q14" value="0"/></td>
    </tr>
    <tr bgcolor="#FFFFFF">
      <td>15.</td>
      <td>I find new experiences interesting</td>
      <td align="center"><input type="radio" name="q15" value="3"/></td>
      <td align="center"><input type="radio" name="q15" value="2"/></td>
      <td align="center"><input type="radio" name="q15" value="1"/></td>
      <td align="center"><input type="radio" name="q15" value="0"/></td>
    </tr>
    <tr bgcolor="#00FFFF">
      <td bgcolor="#E7E7E7">16.</td>
      <td bgcolor="#E7E7E7">I am always a very practical person</td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q16" value="3"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q16" value="2"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q16" value="1"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q16" value="0"/></td>
```

```
    </tr>
    <tr bgcolor="#FFFFFF">
      <td>17.</td>
      <td>I work out my thoughts before I express them</td>
      <td align="center"><input type="radio" name="q17" value="3"/></td>
      <td align="center"><input type="radio" name="q17" value="2"/></td>
      <td align="center"><input type="radio" name="q17" value="1"/></td>
      <td align="center"><input type="radio" name="q17" value="0"/></td>
    </tr>
    <tr bgcolor="#00FFFF">
      <td bgcolor="#E7E7E7">18.</td>
      <td bgcolor="#E7E7E7">I like to take several points of view into  consideration before deciding my
own </td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q18" value="3"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q18" value="2"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q18" value="1"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q18" value="0"/></td>
    </tr>
    <tr bgcolor="#FFFFFF">
      <td>19.</td>
      <td>Straight actions is more typical for me then  careful</td>
      <td align="center"><input type="radio" name="q19" value="3"/></td>
      <td align="center"><input type="radio" name="q19" value="2"/></td>
      <td align="center"><input type="radio" name="q19" value="1"/></td>
      <td align="center"><input type="radio" name="q19" value="0"/></td>
    </tr>
    <tr bgcolor="#00FFFF">
      <td bgcolor="#E7E7E7">20.</td>
      <td bgcolor="#E7E7E7">I tend to get straight to the point in the  meetings</td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q20" value="3"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q20" value="2"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q20" value="1"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q20" value="0"/></td>
    </tr>
    <tr bgcolor="#FFFFFF">
      <td>21.</td>
      <td>I tend to get straight to the point in the  meetings</td>
      <td align="center"><input type="radio" name="q21" value="3"/></td>
      <td align="center"><input type="radio" name="q21" value="2"/></td>
      <td align="center"><input type="radio" name="q21" value="1"/></td>
      <td align="center"><input type="radio" name="q21" value="0"/></td>
    </tr>
    <tr bgcolor="#00FFFF">
      <td bgcolor="#E7E7E7">22.</td>
      <td bgcolor="#E7E7E7">I do not act without proper planning</td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q22" value="3"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q22" value="2"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q22" value="1"/></td>
      <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q22" value="0"/></td>
    </tr>
    <tr bgcolor="#FFFFFF">
      <td>23.</td>
      <td>I like to work in detail before coming to a  conclusion</td>
      <td align="center"><input type="radio" name="q23" value="3"/></td>
      <td align="center"><input type="radio" name="q23" value="2"/></td>
      <td align="center"><input type="radio" name="q23" value="1"/></td>
      <td align="center"><input type="radio" name="q23" value="0"/></td>
```

```
</tr>
<tr bgcolor="#00FFFF">
  <td bgcolor="#E7E7E7">24.</td>
  <td bgcolor="#E7E7E7">I always prefer a systematic way of working</td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q24" value="3"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q24" value="2"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q24" value="1"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q24" value="0"/></td>
</tr>
<tr bgcolor="#FFFFFF">
  <td>25.</td>
  <td>I work analytically when solving problems </td>
  <td align="center"><input type="radio" name="q25" value="3"/></td>
  <td align="center"><input type="radio" name="q25" value="2"/></td>
  <td align="center"><input type="radio" name="q25" value="1"/></td>
  <td align="center"><input type="radio" name="q25" value="0"/></td>
</tr>
<tr bgcolor="#00FFFF">
  <td bgcolor="#E7E7E7">26.</td>
  <td bgcolor="#E7E7E7">&amp;nbsp;I do not  hide my feelings</td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q26" value="3"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q26" value="2"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q26" value="1"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q26" value="0"/></td>
</tr>
<tr bgcolor="#FFFFFF">
  <td>27.</td>
  <td>I work effectively to see the practical results</td>
  <td align="center"><input type="radio" name="q27" value="3"/></td>
  <td align="center"><input type="radio" name="q27" value="2"/></td>
  <td align="center"><input type="radio" name="q27" value="1"/></td>
  <td align="center"><input type="radio" name="q27" value="0"/></td>
</tr>
<tr bgcolor="#00FFFF">
  <td bgcolor="#E7E7E7">28.</td>
  <td bgcolor="#E7E7E7">I avoid making hasty conclusions</td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q28" value="3"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q28" value="2"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q28" value="1"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q28" value="0"/></td>
</tr>
<tr bgcolor="#FFFFFF">
  <td>29.</td>
  <td>I am interested in putting ideas into practice</td>
  <td align="center"><input type="radio" name="q29" value="3"/></td>
  <td align="center"><input type="radio" name="q29" value="2"/></td>
  <td align="center"><input type="radio" name="q29" value="1"/></td>
  <td align="center"><input type="radio" name="q29" value="0"/></td>
</tr>
<tr bgcolor="#00FFFF">
  <td bgcolor="#E7E7E7">30.</td>
  <td bgcolor="#E7E7E7">I tend to organize my thoughts well</td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q30" value="3"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q30" value="2"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q30" value="1"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q30" value="0"/></td>
</tr>
```

```
<tr bgcolor="#FFFFFF">
  <td>31.</td>
  <td>I seek theoretical principles behind things and  events</td>
  <td align="center"><input type="radio" name="q31" value="3"/></td>
  <td align="center"><input type="radio" name="q31" value="2"/></td>
  <td align="center"><input type="radio" name="q31" value="1"/></td>
  <td align="center"><input type="radio" name="q31" value="0"/></td>
</tr>
<tr bgcolor="#00FFFF">
  <td bgcolor="#E7E7E7">32.</td>
  <td bgcolor="#E7E7E7">I am usually the innovative person in the social  situations</td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q32" value="3"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q32" value="2"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q32" value="1"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q32" value="0"/></td>
</tr>
<tr bgcolor="#FFFFFF">
  <td>33.</td>
  <td>I like talking more than listening </td>
  <td align="center"><input type="radio" name="q33" value="3"/></td>
  <td align="center"><input type="radio" name="q33" value="2"/></td>
  <td align="center"><input type="radio" name="q33" value="1"/></td>
  <td align="center"><input type="radio" name="q33" value="0"/></td>
</tr>
<tr bgcolor="#00FFFF">
  <td bgcolor="#E7E7E7">34.</td>
  <td bgcolor="#E7E7E7">Scientifically proved theories interest me</td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q34" value="3"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q34" value="2"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q34" value="1"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q34" value="0"/></td>
</tr>
<tr bgcolor="#FFFFFF">
  <td>35.</td>
  <td>I find it difficult to be spontaneous</td>
  <td align="center"><input type="radio" name="q35" value="3"/></td>
  <td align="center"><input type="radio" name="q35" value="2"/></td>
  <td align="center"><input type="radio" name="q35" value="1"/></td>
  <td align="center"><input type="radio" name="q35" value="0"/></td>
</tr>
<tr bgcolor="#00FFFF">
  <td bgcolor="#E7E7E7">36.</td>
  <td bgcolor="#E7E7E7">I am open to use any efficient method to reach  results</td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q36" value="3"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q36" value="2"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q36" value="1"/></td>
  <td align="center" bgcolor="#E7E7E7"><input type="radio" name="q36" value="0"/></td>
</tr>
<tr bgcolor="#FFFFFF">
  <td>&amp;nbsp;</td>
  <td>&amp;nbsp;</td>
  <td colspan="4"><label></label>
    <label>
      <br />
      <input type="submit" name="button" id="button" value="Submit" />
    </label></td>
</tr>
```

```
   </table>
   <p>
     <label></label>
   </p>
  </form>
</div>
            <div id="footer">
<div class="footer">
            <ul>
                                                <div align="center">Ahmadu Bello University, Zaria © 2010 </div>
            </ul>
            <p align="center">By AMAH MATHEW NGOZI<br />
M.Sc/SCIE/00394/2006-07</p>
</div>
</div>
</body>
</html>
Process
<?php
$con = mysql_connect("localhost","root","");
if (!$con)
  {
  die('Could not connect: ' . mysql_error());
  }
mysql_select_db("elearning", $con);
?>
<?php
session_start();
//echo the values
echo $_SESSION['surname']."<br/>";
echo $_SESSION['firstname']."<br/>";
echo $_SESSION['others']."<br/>";
echo $_SESSION['sex']."<br/>";
echo $_SESSION['level']."<br/>";
echo $_SESSION['email']."<br/>";
echo $_SESSION['mobile']."<br/>";
echo $_SESSION['student_id']."<br/>";
echo $_SESSION['password']."<br/>";

//take session to a variable
$surname = $_SESSION['surname'];
$firstname = $_SESSION['firstname'];
$others = $_SESSION['others'];
$sex = $_SESSION['sex'] ;
$level = $_SESSION['level'];
$email = $_SESSION['email'] ;
$mobile = $_SESSION['mobile'] ;
$student_id = $_SESSION['student_id'];
$password = $_SESSION['password'];
?>
<?php
$question1 =$_POST['q1'];
$question2 =$_POST['q2'];
$question3 =$_POST['q3'];
$question4 =$_POST['q4'];
$question5 =$_POST['q5'];
$question6 =$_POST['q6'];
```

```
$question7 =$_POST['q7'];
$question8 =$_POST['q8'];
$question9 =$_POST['q9'];
$question10 =$_POST['q10'];
$question11 =$_POST['q11'];
$question12 =$_POST['q12'];
$question13 =$_POST['q13'];
$question14 =$_POST['q14'];
$question15 =$_POST['q15'];
$question16 =$_POST['q16'];
$question17 =$_POST['q17'];
$question18 =$_POST['q18'];
$question19 =$_POST['q19'];
$question20 =$_POST['q20'];
$question21 =$_POST['q21'];
$question22 =$_POST['q22'];
$question23 =$_POST['q23'];
$question24 =$_POST['q24'];
$question25 =$_POST['q25'];
$question26 =$_POST['q26'];
$question27 =$_POST['q27'];
$question28 =$_POST['q28'];
$question29 =$_POST['q29'];
$question30 =$_POST['q30'];
$question31 =$_POST['q31'];
$question32 =$_POST['q32'];
$question33 =$_POST['q33'];
$question34 =$_POST['q34'];
$question35 =$_POST['q35'];
$question36 =$_POST['q36'];
$A= $question1 + $question2 + $question3 + $question4 + $question5 + $question6 + $question7 +
$question8 + $question9;
$B= $question10 + $question11 + $question12 + $question13 + $question14 + $question15 + $question16
+ $question17 + $question18;
$C= $question19 + $question20 + $question21 + $question22 + $question23 + $question24 + $question25
+ $question26 + $question27;
$D= $question28 + $question29 + $question30 + $question31 + $question32 + $question33 + $question34
+ $question35 + $question36;
if ($A > $B && $A > $C && $A > $D){
        mysql_query("INSERT INTO students (surname, firstname, othername, sex, level, email, mobile,
student_id, password, grade)
   VALUES ('$surname', '$firstname', '$others', '$sex', '$level', '$email', '$mobile', '$student_id',
'$password', '4activist')");
        session_destroy();
        header ("location: activist_success.php");
}
elseif ($A < $B && $B > $C && $B > $D){
        mysql_query("INSERT INTO students (surname, firstname, othername, sex, level, email, mobile,
student_id, password, grade)
   VALUES ('$surname', '$firstname', '$others', '$sex', '$level', '$email', '$mobile', '$student_id',
'$password', '3reflector')");
        session_destroy();
        header ("location: reflector_success.php");
}
elseif ($A < $C && $B < $C && $C > $D){
        mysql_query("INSERT INTO students (surname, firstname, othername, sex, level, email, mobile,
student_id, password, grade)
```

```
   VALUES ('$surname', '$firstname', '$others', '$sex', '$level', '$email', '$mobile', '$student_id',
'$password', '2theorist')");
            session_destroy();
            header ("location: theorist_success.php");
}
elseif ($A < $D && $B < $D && $C < $D){
            mysql_query("INSERT INTO students (surname, firstname, othername, sex, level, email, mobile,
student_id, password, grade)
   VALUES ('$surname', '$firstname', '$others', '$sex', '$level', '$email', '$mobile', '$student_id',
'$password', '1pragmatist')");
            session_destroy();
            header ("location: pragmatist_success.php");
}
else {
            mysql_query("INSERT INTO students (surname, firstname, othername, sex, level, email, mobile,
student_id, password, grade)
   VALUES ('$surname', '$firstname', '$others', '$sex', '$level', '$email', '$mobile', '$student_id',
'$password', 'default')");
            session_destroy();
            header ("location: default_success.php");
}
?>
```

Student Register

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />
<title>Personalized E- Learning System :: Students</title>
<link href="style.css" rel="stylesheet" type="text/css" />
<style type="text/css">
<!--
.style1 {color: #FF0000}
-->
</style>
<script type="text/javascript">
<!--
function MM_validateForm() { //v4.0
 if (document.getElementById){
   var i,p,q,nm,test,num,min,max,errors='',args=MM_validateForm.arguments;
   for (i=0; i<(args.length-2); i+=3) { test=args[i+2]; val=document.getElementById(args[i]);
     if (val) { nm=val.name; if ((val=val.value)!="") {
       if (test.indexOf('isEmail')!=-1) { p=val.indexOf('@');
         if (p<1 || p==(val.length-1)) errors+='- '+nm+' must contain an e-mail address.\n';
       } else if (test!='R') { num = parseFloat(val);
         if (isNaN(val)) errors+='- '+nm+' must contain a number.\n';
         if (test.indexOf('inRange') != -1) { p=test.indexOf(':');
           min=test.substring(8,p); max=test.substring(p+1);
           if (num<min || max<num) errors+='- '+nm+' must contain a number between '+min+' and
'+max+'.\n';
     } } } else if (test.charAt(0) == 'R') errors += '- '+nm+' is required.\n'; }
   } if (errors) alert('The following error(s) occurred:\n'+errors);
   document.MM_returnValue = (errors == '');
} }
//-->
</script>
</head>
```

```
<body>
                    <div id="header">
            </div>
<div id="topNav">
                    <ul>
                                <li><a href="" title="Home">Home</a></li>
                                <li><a href="tutor/tutor.php" title="Tutor">Tutor</a></li>
                                <li><a href="students.php" title="Students">Students</a></li>
                                <li><a href="support.php" title="Help & Support">Help & Support</a></li>
                                <li><a href="contact.php" title="Contact" class="hover">Contact Us</a></li>
                    </ul>
  <p> </p>
                    <p> </p>
                    <p> </p>
</div>
<div id="body">
  <table width="95%" border="0" align="center">
    <tr>
      <td height="431" colspan="6" valign="top"><table width="579" height="324" border="0"
align="center">
        <tr>
          <td height="320" align="center" valign="top"><form action="students/quiz.php" method="post"
name="students_register" id="students_register"
onsubmit="MM_validateForm('surname','','R','firstname','','R','others','','R');return
document.MM_returnValue">
            <p>
              <label for="firstname"></label>
              </p>
            <p><span class="style1">New Members                </span></p>
            <fieldset>
              <legend>Students Registeration</legend>
              <table width="308" height="274" border="0">
                <tr>
                  <td width="99" align="right">Surname: </td>
                  <td width="199" align="left"><input name="surname" type="text" id="surname"/></td>
                  </tr>
                <tr>
                  <td align="right">Firstname:</td>
                  <td align="left"><input name="firstname" type="text" id="firstname"/></td>
                  </tr>
                <tr>
                  <td align="right">Othername:</td>
                  <td align="left"><input name="others" type="text" id="others"/></td>
                  </tr>
                <tr>
                  <td align="right">Gender: </td>
                  <td align="left"><select name="sex">
                    <option value="male" selected="selected">male</option>
                    <option value="female">female</option>
                    </select></td>
                  </tr>
                <tr>
                  <td height="34" align="right">Level: </td>
                  <td align="left"><select name="level" id="level">
                    <option>- select -</option>
                    <option value="1">100</option>
                    <option value="2">200</option>
```

```
            <option value="3">300</option>
            <option value="4">400</option>
            </select></td>
           </tr>
          <tr>
           <td align="right">Email:</td>
           <td align="left"><input type="text" name="email"/></td>
           </tr>
          <tr>
           <td align="right"><p>Phone Number: </p></td>
           <td align="left"><input type="text" name="mobile"/></td>
           </tr>
          <tr>
           <td align="right">Student    ID: </td>
           <td align="left"><input type="text" name="student_id" id="student_id"/></td>
           </tr>
          <tr>
           <td align="right">Password: </td>
           <td align="left"><input name="password" type="password" id="password"/></td>
           </tr>
          <tr>
           <td align="right"> </td>
           <td align="left"><input type="submit" name="submit" id="submit" value="submit" /></td>
           </tr>
          </table>
         </fieldset>
        <p>
         <label for="radio"></label>
         </p>
        </form></td>
      </tr>
    </table></td>
   </tr>
  </table>
</div>
          <div id="footer">
<div class="footer">
          <ul>
                                        <div align="center">Ahmadu Bello University, Zaria © 2010 </div>
          </ul>
          <p align="center">By AMAH MATHEW NGOZI<br />
M.Sc/SCIE/00394/2006-07</p>
</div>
</div>
</body>
</html>
```

Student Register

```
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<style type="text/css">
<!--
.style1 {color: #FF0000}
```

```
-->
</style>
<script type="text/javascript">
<!--
function MM_validateForm() { //v4.0
  if (document.getElementById){
    var i,p,q,nm,test,num,min,max,errors='',args=MM_validateForm.arguments;
    for (i=0; i<(args.length-2); i+=3) { test=args[i+2]; val=document.getElementById(args[i]);
      if (val) { nm=val.name; if ((val=val.value)!="") {
        if (test.indexOf('isEmail')!=-1) { p=val.indexOf('@');
          if (p<1 || p==(val.length-1)) errors+='- '+nm+' must contain an e-mail address.\n';
        } else if (test!='R') { num = parseFloat(val);
          if (isNaN(val)) errors+='- '+nm+' must contain a number.\n';
          if (test.indexOf('inRange') != -1) { p=test.indexOf(':');
            min=test.substring(8,p); max=test.substring(p+1);
            if (num<min || max<num) errors+='- '+nm+' must contain a number between '+min+' and
'+max+'.\n';
      } } } else if (test.charAt(0) == 'R') errors += '- '+nm+' is required.\n'; }
    } if (errors) alert('The following error(s) occurred:\n'+errors);
    document.MM_returnValue = (errors == '');
} }
//-->
</script>
</head>
<body>
            <div id="header">
              </div>
<div id="topNav">
                        <ul>
                                    <li><a href="" title="Home">Home</a></li>
                                    <li><a href="tutor/tutor.php" title="Tutor">Tutor</a></li>
                                    <li><a href="students.php" title="Students">Students</a></li>
                                    <li><a href="support.php" title="Help & Support">Help & Support</a></li>
                                    <li><a href="contact.php" title="Contact" class="hover">Contact Us</a></li>
                        </ul>
  <p> </p>
                        <p> </p>
                        <p> </p>
</div>
<div id="body">
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    <tr>
      <td height="431" colspan="6" valign="top"><table width="579" height="324" border="0"
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        <tr>
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name="students_register" id="students_register"
onsubmit="MM_validateForm('surname','','R','firstname','','R','others','','R');return
document.MM_returnValue">
            <p>
              <label for="firstname"></label>
              </p>
            <p><span class="style1">New Members                </span></p>
            <fieldset>
              <legend>Students Registeration</legend>
              <table width="308" height="274" border="0">
                <tr>
```

```
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          </tr>
        <tr>
          <td align="right">Firstname:</td>
          <td align="left"><input name="firstname" type="text" id="firstname"/></td>
          </tr>
        <tr>
          <td align="right">Othername:</td>
          <td align="left"><input name="others" type="text" id="others"/></td>
          </tr>
        <tr>
          <td align="right">Gender: </td>
          <td align="left"><select name="sex">
            <option value="male" selected="selected">male</option>
            <option value="female">female</option>
            </select></td>
          </tr>
        <tr>
          <td height="34" align="right">Level: </td>
          <td align="left"><select name="level" id="level">
            <option>- select -</option>
            <option value="1">100</option>
            <option value="2">200</option>
            <option value="3">300</option>
            <option value="4">400</option>
            </select></td>
          </tr>
        <tr>
          <td align="right">Email:</td>
          <td align="left"><input type="text" name="email"/></td>
          </tr>
        <tr>
          <td align="right"><p>Phone Number: </p></td>
          <td align="left"><input type="text" name="mobile"/></td>
          </tr>
        <tr>
          <td align="right">Student    ID: </td>
          <td align="left"><input type="text" name="student_id" id="student_id"/></td>
          </tr>
        <tr>
          <td align="right">Password: </td>
          <td align="left"><input name="password" type="password" id="password"/></td>
          </tr>
        <tr>
          <td align="right"> </td>
          <td align="left"><input type="submit" name="submit" id="submit" value="submit" /></td>
          </tr>
        </table>
      </fieldset>
    <p>
      <label for="radio"></label>
      </p>
    </form></td>
  </tr>
 </table></td>
</tr>
```

```
  </table>
</div>
        <div id="footer">
<div class="footer">
        <ul>
                                <div align="center">Ahmadu Bello University, Zaria © 2010 </div>
        </ul>
        <p align="center">By AMAH MATHEW NGOZI<br />
M.Sc/SCIE/00394/2006-07</p>
</div>
</div>
</body>
</html>
```

ADD LEARNING MATERIAL

```
<?php require_once('Connections/connection.php'); ?><?php
//initialize the session
if (!isset($_SESSION)) {
  session_start();
}
// ** Logout the current user. **
$logoutAction = $_SERVER['PHP_SELF']."?doLogout=true";
if ((isset($_SERVER['QUERY_STRING'])) && ($_SERVER['QUERY_STRING'] != "")){
  $logoutAction .="&". htmlentities($_SERVER['QUERY_STRING']);
}
if ((isset($_GET['doLogout'])) &&($_GET['doLogout']=="true")){
  //to fully log out a visitor we need to clear the session varialbles
  $_SESSION['MM_Username'] = NULL;
  $_SESSION['MM_UserGroup'] = NULL;
  $_SESSION['PrevUrl'] = NULL;
  unset($_SESSION['MM_Username']);
  unset($_SESSION['MM_UserGroup']);
  unset($_SESSION['PrevUrl']);

  $logoutGoTo = "students.php";
  if ($logoutGoTo) {
    header("Location: $logoutGoTo");
    exit;
  }
}
?>
<?php
if (!isset($_SESSION)) {
  session_start();
}
$MM_authorizedUsers = "";
$MM_donotCheckaccess = "true";
// *** Restrict Access To Page: Grant or deny access to this page
function isAuthorized($strUsers, $strGroups, $UserName, $UserGroup) {
  // For security, start by assuming the visitor is NOT authorized.
  $isValid = False;
  // When a visitor has logged into this site, the Session variable MM_Username set equal to their username.
  // Therefore, we know that a user is NOT logged in if that Session variable is blank.
  if (!empty($UserName)) {
    // Besides being logged in, you may restrict access to only certain users based on an ID established when
they login.
    // Parse the strings into arrays.
    $arrUsers = Explode(",", $strUsers);
```

```
    $arrGroups = Explode(",", $strGroups);
    if (in_array($UserName, $arrUsers)) {
      $isValid = true;
    }
    // Or, you may restrict access to only certain users based on their username.
    if (in_array($UserGroup, $arrGroups)) {
      $isValid = true;
    }
    if (($strUsers == "") && true) {
      $isValid = true;
    }
  }
  return $isValid;
}
$MM_restrictGoTo = "students.php";
if (!((isset($_SESSION['MM_Username'])) && (isAuthorized("",$MM_authorizedUsers,
$_SESSION['MM_Username'], $_SESSION['MM_UserGroup'])))) {
  $MM_qsChar = "?";
  $MM_referrer = $_SERVER['PHP_SELF'];
  if (strpos($MM_restrictGoTo, "?")) $MM_qsChar = "&";
  if (isset($QUERY_STRING) && strlen($QUERY_STRING) > 0)
  $MM_referrer .= "?" . $QUERY_STRING;
  $MM_restrictGoTo = $MM_restrictGoTo. $MM_qsChar . "accesscheck=" . urlencode($MM_referrer);
  header("Location: ". $MM_restrictGoTo);
  exit;
}
?>
<?php
function GetSQLValueString($theValue, $theType, $theDefinedValue = "", $theNotDefinedValue = "")
{
  $theValue = (!get_magic_quotes_gpc()) ? addslashes($theValue) : $theValue;
  switch ($theType) {
    case "text":
      $theValue = ($theValue != "") ? "'" . $theValue . "'" : "NULL";
      break;
    case "long":
    case "int":
      $theValue = ($theValue != "") ? intval($theValue) : "NULL";
      break;
    case "double":
      $theValue = ($theValue != "") ? "'" . doubleval($theValue) . "'" : "NULL";
      break;
    case "date":
      $theValue = ($theValue != "") ? "'" . $theValue . "'" : "NULL";
      break;
    case "defined":
      $theValue = ($theValue != "") ? $theDefinedValue : $theNotDefinedValue;
      break;
  }
  return $theValue;
}
$editFormAction = $_SERVER['PHP_SELF'];
if (isset($_SERVER['QUERY_STRING'])) {
  $editFormAction .= "?" . htmlentities($_SERVER['QUERY_STRING']);
}
if ((isset($_POST["MM_insert"])) && ($_POST["MM_insert"] == "form1")) {
```

```
  $insertSQL = sprintf("INSERT INTO 4activist (course_title, email, course_content) VALUES (%s, %s,
%s)",
                       GetSQLValueString($_POST['course_title'], "text"),
                       GetSQLValueString($_POST['email'], "text"),
                       GetSQLValueString($_POST['course_content'], "text"));
  mysql_select_db($database_connection, $connection);
  $Result1 = mysql_query($insertSQL, $connection) or die(mysql_error());
  $insertGoTo = "tutor/tutor_loginsuccess.php";
  if (isset($_SERVER['QUERY_STRING'])) {
    $insertGoTo .= (strpos($insertGoTo, '?')) ? "&" : "?";
    $insertGoTo .= $_SERVER['QUERY_STRING'];
  }
  header(sprintf("Location: %s", $insertGoTo));
}
if (!function_exists("GetSQLValueString")) {
function GetSQLValueString($theValue, $theType, $theDefinedValue = "", $theNotDefinedValue = "")
{
  $theValue = get_magic_quotes_gpc() ? stripslashes($theValue) : $theValue;
  $theValue = function_exists("mysql_real_escape_string") ? mysql_real_escape_string($theValue) :
mysql_escape_string($theValue);
  switch ($theType) {
    case "text":
      $theValue = ($theValue != "") ? "'" . $theValue . "'" : "NULL";
      break;
    case "long":
    case "int":
      $theValue = ($theValue != "") ? intval($theValue) : "NULL";
      break;
    case "double":
      $theValue = ($theValue != "") ? "'" . doubleval($theValue) . "'" : "NULL";
      break;
    case "date":
      $theValue = ($theValue != "") ? "'" . $theValue . "'" : "NULL";
      break;
    case "defined":
      $theValue = ($theValue != "") ? $theDefinedValue : $theNotDefinedValue;
      break;
  }
  return $theValue;
}
}
mysql_select_db($database_connection, $connection);
$query_theorist = "SELECT * FROM `2theorist`";
$theorist = mysql_query($query_theorist, $connection) or die(mysql_error());
$row_theorist = mysql_fetch_assoc($theorist);
$totalRows_theorist = mysql_num_rows($theorist);
?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />
<title>Personalized E- Learning System :: Students</title>
<link href="style.css" rel="stylesheet" type="text/css" />
<style type="text/css">
<!--
.style1 {color: #FF0000}
```

```
-->
</style>
</head>
<body>
        <div id="header">
          </div>
        <div id="topNav">
    <ul>
      <li><a href="index.php" title="Home">Home</a></li>
      <li><a href="tutor/tutor.php" title="Tutor" class="hover">Tutor</a></li>
      <li><a href="students.php" title="Students" >Students</a></li>
      <li><a href="support.php" title="Help &amp; Support">Help &amp; Support</a></li>
      <li><a href="contact.php" title="Contact">Contact Us</a></li>
    </ul>
          <p> </p>
          <p> </p>
          <p> </p>
</div>
        <div id="body">
    <table width="99%" border="0" align="center">
      <tr>
       <td height="182" colspan="6" valign="top"><fieldset>
        <legend> <a href="<?php echo $logoutAction ?>">LOGOUT</a></legend>

            <p><br />
            ACTIVIST                </p>
            <p> </p>

            <form method="post" name="form1" action="<?php echo $editFormAction; ?>">
              <table align="center">
                <tr valign="baseline">
                  <td nowrap align="right">Course title:</td>
                  <td><input type="text" name="course_title" value="" size="32"></td>
                </tr>
                <tr valign="baseline">
                  <td nowrap align="right">Email:</td>
                  <td><input type="text" name="email" value="" size="32"></td>
                </tr>
                <tr valign="baseline">
                  <td nowrap align="right" valign="top">Course content:</td>
                  <td><textarea name="course_content" cols="50" rows="5"></textarea>
                  </td>
                </tr>
                <tr valign="baseline">
                  <td nowrap align="right"> </td>
                  <td><input type="submit" value="submit"></td>
                </tr>
              </table>
              <input type="hidden" name="MM_insert" value="form1">
            </form>
            <p> </p>
            <p> </p>
       <br />
       </fieldset></td>
      </tr>
    </table>
</div>
```

```
		<div id="footer">
<div class="footer">
		<ul>
<div align="center">Ahmadu Bello University, Zaria © 2010 </div>
		</ul>
		<p align="center">By AMAH MATHEW NGOZI<br />
M.Sc/SCIE/00394/2006-07</p>
</div>
</div>
</body>
</html>
<?php
mysql_free_result($theorist);
?>
```

EDIT LEARNING MATERIAL

```
<?php require_once('../Connections/connection.php'); ?>
<?php
//initialize the session
if (!isset($_SESSION)) {
  session_start();
}

// ** Logout the current user. **
$logoutAction = $_SERVER['PHP_SELF']."?doLogout=true";
if ((isset($_SERVER['QUERY_STRING'])) && ($_SERVER['QUERY_STRING'] != "")){
  $logoutAction .="&". htmlentities($_SERVER['QUERY_STRING']);
}
if ((isset($_GET['doLogout'])) &&($_GET['doLogout']=="true")){
  //to fully log out a visitor we need to clear the session varialbles
  $_SESSION['MM_Username'] = NULL;
  $_SESSION['MM_UserGroup'] = NULL;
  $_SESSION['PrevUrl'] = NULL;
  unset($_SESSION['MM_Username']);
  unset($_SESSION['MM_UserGroup']);
  unset($_SESSION['PrevUrl']);
  $logoutGoTo = "tutor.php";
  if ($logoutGoTo) {
    header("Location: $logoutGoTo");
    exit;
  }
}
?>
<?php
if (!isset($_SESSION)) {
  session_start();
}
$MM_authorizedUsers = "";
$MM_donotCheckaccess = "true";

// *** Restrict Access To Page: Grant or deny access to this page
function isAuthorized($strUsers, $strGroups, $UserName, $UserGroup) {
  // For security, start by assuming the visitor is NOT authorized.
  $isValid = False;
  // When a visitor has logged into this site, the Session variable MM_Username set equal to their username.
  // Therefore, we know that a user is NOT logged in if that Session variable is blank.
  if (!empty($UserName)) {
```

```
    // Besides being logged in, you may restrict access to only certain users based on an ID established when
they login.
    // Parse the strings into arrays.
    $arrUsers = Explode(",", $strUsers);
    $arrGroups = Explode(",", $strGroups);
    if (in_array($UserName, $arrUsers)) {
      $isValid = true;
    }
    // Or, you may restrict access to only certain users based on their username.
    if (in_array($UserGroup, $arrGroups)) {
      $isValid = true;
    }
    if (($strUsers == "") && true) {
      $isValid = true;
    }
  }
  return $isValid;
}

$MM_restrictGoTo = "tutor.php";
if (!((isset($_SESSION['MM_Username'])) && (isAuthorized("",$MM_authorizedUsers,
$_SESSION['MM_Username'], $_SESSION['MM_UserGroup'])))) {
  $MM_qsChar = "?";
  $MM_referrer = $_SERVER['PHP_SELF'];
  if (strpos($MM_restrictGoTo, "?")) $MM_qsChar = "&";
  if (isset($QUERY_STRING) && strlen($QUERY_STRING) > 0)
  $MM_referrer .= "?" . $QUERY_STRING;
  $MM_restrictGoTo = $MM_restrictGoTo. $MM_qsChar . "accesscheck=" . urlencode($MM_referrer);
  header("Location: ". $MM_restrictGoTo);
  exit;
}
?>
<?php
if (!function_exists("GetSQLValueString")) {
function GetSQLValueString($theValue, $theType, $theDefinedValue = "", $theNotDefinedValue = "")
{
  $theValue = get_magic_quotes_gpc() ? stripslashes($theValue) : $theValue;
  $theValue = function_exists("mysql_real_escape_string") ? mysql_real_escape_string($theValue) :
mysql_escape_string($theValue);
  switch ($theType) {
    case "text":
      $theValue = ($theValue != "") ? "'" . $theValue . "'" : "NULL";
      break;
    case "long":
    case "int":
      $theValue = ($theValue != "") ? intval($theValue) : "NULL";
      break;
    case "double":
      $theValue = ($theValue != "") ? "'" . doubleval($theValue) . "'" : "NULL";
      break;
    case "date":
      $theValue = ($theValue != "") ? "'" . $theValue . "'" : "NULL";
      break;
    case "defined":
      $theValue = ($theValue != "") ? $theDefinedValue : $theNotDefinedValue;
      break;
  }
```

```
  return $theValue;
}
}
$colname_edit_tutorprofile = "-1";
if (isset($_SESSION['MM_Username'])) {
  $colname_edit_tutorprofile = $_SESSION['MM_Username'];
}
mysql_select_db($database_connection, $connection);
$query_edit_tutorprofile = sprintf("SELECT * FROM tutor WHERE tutor_id = %s",
GetSQLValueString($colname_edit_tutorprofile, "text"));
$edit_tutorprofile = mysql_query($query_edit_tutorprofile, $connection) or die(mysql_error());
$row_edit_tutorprofile = mysql_fetch_assoc($edit_tutorprofile);
$totalRows_edit_tutorprofile = mysql_num_rows($edit_tutorprofile);
mysql_select_db($database_connection, $connection);
$query_activist_sub = "SELECT id, course_title FROM `4activist`";
$activist_sub = mysql_query($query_activist_sub, $connection) or die(mysql_error());
$row_activist_sub = mysql_fetch_assoc($activist_sub);
$totalRows_activist_sub = mysql_num_rows($activist_sub);
mysql_select_db($database_connection, $connection);
$query_reflector_sub = "SELECT id, course_title FROM `3reflector`";
$reflector_sub = mysql_query($query_reflector_sub, $connection) or die(mysql_error());
$row_reflector_sub = mysql_fetch_assoc($reflector_sub);
$totalRows_reflector_sub = mysql_num_rows($reflector_sub);
mysql_select_db($database_connection, $connection);
$query_theorist_sub = "SELECT id, course_title FROM `2theorist`";
$theorist_sub = mysql_query($query_theorist_sub, $connection) or die(mysql_error());
$row_theorist_sub = mysql_fetch_assoc($theorist_sub);
$totalRows_theorist_sub = mysql_num_rows($theorist_sub);
mysql_select_db($database_connection, $connection);
$query_pragmatist_sub = "SELECT id, course_title FROM `1pragmatist`";
$pragmatist_sub = mysql_query($query_pragmatist_sub, $connection) or die(mysql_error());
$row_pragmatist_sub = mysql_fetch_assoc($pragmatist_sub);
$totalRows_pragmatist_sub = mysql_num_rows($pragmatist_sub);
mysql_select_db($database_connection, $connection);
$query_default_sub = "SELECT id, course_title FROM defaul";
$default_sub = mysql_query($query_default_sub, $connection) or die(mysql_error());
$row_default_sub = mysql_fetch_assoc($default_sub);
$totalRows_default_sub = mysql_num_rows($default_sub);
?><!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />
<title>Personalized E- Learning System :: Students</title>
<link href="../style.css" rel="stylesheet" type="text/css" />
<style type="text/css">
<!--
.style2 {color: #990000}
-->
</style>
</head>
<body>
            <div id="header">              </div>
            <div id="topNav">
     <ul>
       <li><a href="" title="Home">Home</a></li>
       <li><a href="tutor.php" title="Tutor" class="hover">Tutor</a></li>
```

```
      <li><a href="../students.php" title="Students">Students</a></li>
      <li><a href="../support.php" title="Help &amp;amp; Support">Help &amp;amp; Support</a></li>
      <li><a href="../contact.php" title="Contact">Contact Us</a></li>
    </ul>
            <p> </p>
            <p> </p>
            <p> </p>
</div>

<div id="body">
  <table width="95%" border="0" align="center">
    <tr>
      <td height="182" colspan="6" valign="top"><fieldset>
        <legend><a href="<?php echo $logoutAction ?>">Logout</a></legend>
        <table width="579" height="200" border="0" align="center">
          <tr>
            <td height="196" align="center" valign="middle"><p> </p>
              <p><strong>You Have Successful Logged in</strong> <a
href="edit_tutorprofile.php?tutor_id=<?php echo $row_edit_tutorprofile['tutor_id']; ?>">Edit
Profie</a></p>
              <table width="354" border="0">
                <tr>
                  <td align="left" bgcolor="#CCCCCC">             </td>
                </tr>
                <tr>
                  <td align="left" bgcolor="#CCCCCC">Edit  Learning Material</td>
                </tr>
                <tr>
                  <td align="left">
                    <table width="100%" border="0">
                      <tr>
                        <td width="45%"><strong>Activist </strong> </td>
                        <td width="55%" bgcolor="#CCCCCC"><strong><a href="../activist_add.php">Add
learning Materials</a></strong></td>
                      </tr>
                    </table></td>
                </tr>
                <tr>
                  <td align="left">
                    <table>
                      <?php do { ?>
                        <tr>
                          <td width="216" height="21"> Topic <strong>:</strong> <a
href="../4activist.php?id=<?php echo $row_activist_sub['id']; ?>" class="style2"><?php echo
$row_activist_sub['course_title']; ?></a></td>
                        </tr>
                        <?php } while ($row_activist_sub = mysql_fetch_assoc($activist_sub)); ?>
                    </table></td>
                </tr>
                <tr>
                  <td width="348" align="left">
                    <table width="100%" border="0">
                      <tr>
                        <td width="45%"><strong>Reflector</strong> </td>
                        <td width="55%" bgcolor="#CCCCCC"><strong><a href="../reflector_add.php">Add
learning Materials</a></strong></td>
                      </tr>
```

```
            </table></td>
          </tr>
          <tr>
            <td align="left">
              <table width="298">

                <?php do { ?>
                  <tr>
                    <td>Topic :<a href="../3reflector.php?id=<?php echo $row_reflector_sub['id']; ?>"><?php
echo $row_reflector_sub['course_title']; ?></a></td>
                  </tr>
                <?php } while ($row_reflector_sub = mysql_fetch_assoc($reflector_sub)); ?>
              </table></td>
          </tr>
          <tr>
            <td align="left">
              <table width="100%" border="0">
                <tr>
                  <td width="45%"><strong>Theorist</strong> </td>
                  <td width="55%" bgcolor="#CCCCCC"><strong><a href="../theorist_add.php">Add
learning Materials</a></strong></td>
                </tr>
              </table></td>
          </tr>
          <tr>
            <td align="left"><table>

                <?php do { ?>
                  <tr>
                    <td width="252">Topic:<a href="../2theorist.php?id=<?php echo $row_theorist_sub['id'];
?>"> <?php echo $row_theorist_sub['course_title']; ?></a></td>
                  </tr>
                <?php } while ($row_theorist_sub = mysql_fetch_assoc($theorist_sub)); ?>
              </table></td>
          </tr>
          <tr>
            <td align="left"><table width="100%" border="0">
                <tr>
                  <td width="45%"><strong>Pragmatist</strong></td>
                  <td width="55%" bgcolor="#CCCCCC"><strong><a href="../pragmatist_add.php">Add
learning Materials</a></strong></td>
                </tr>
              </table></td>
          </tr>
          <tr>
            <td align="left">
              <table>
                <?php do { ?>
                  <tr>
                    <td width="264">Topic: <a href="../1pragmatist.php?id=<?php echo
$row_pragmatist_sub['id']; ?>"><?php echo $row_pragmatist_sub['course_title']; ?></a></td>
                  </tr>
                <?php } while ($row_pragmatist_sub = mysql_fetch_assoc($pragmatist_sub)); ?>
              </table></td>
          </tr>
          <tr>
            <td align="left"><table width="100%" border="0">
```

```
                <tr>
                  <td width="45%"><strong>Default</strong></td>
                  <td width="55%" bgcolor="#CCCCCC"><strong>Add learning Materials</strong></td>
                </tr>
              </table></td>
            </tr>
            <tr>
              <td align="left"><table width="265">

                <?php do { ?>
                  <tr>
                    <td>Topic : <a href="../default.php?id=<?php echo $row_default_sub['id']; ?>"><?php
echo $row_default_sub['course_title']; ?></a></td>
                  </tr>
                <?php } while ($row_default_sub = mysql_fetch_assoc($default_sub)); ?>
              </table></td>
            </tr>
          </table>
          <p> </p>
        </tr>
    </table>
    </fieldset>
    </td>
  </tr>
 </table>
</div>
          <div id="footer">
<div class="footer">
          <ul>
                                        <div align="center">Ahmadu Bello University, Zaria © 2010 </div>
          </ul>
          <p align="center">By AMAH MATHEW NGOZI<br />
M.Sc/SCIE/00394/2006-07</p>
</div>
</div>
</body>
</html>
<?php
mysql_free_result($edit_tutorprofile);
mysql_free_result($activist_sub);
mysql_free_result($reflector_sub);
mysql_free_result($theorist_sub);
mysql_free_result($pragmatist_sub);
mysql_free_result($default_sub);
?>
```

Authenticate user

```
<?php require_once('Connections/connection.php'); ?>
<?php
//initialize the session
if (!isset($_SESSION)) {
  session_start();
}
// ** Logout the current user. **
$logoutAction = $_SERVER['PHP_SELF']."?doLogout=true";
if ((isset($_SERVER['QUERY_STRING'])) && ($_SERVER['QUERY_STRING'] != "")){
  $logoutAction .="&". htmlentities($_SERVER['QUERY_STRING']);
```

```
}

if ((isset($_GET['doLogout'])) &&($_GET['doLogout']=="true")){
  //to fully log out a visitor we need to clear the session varialbles
  $_SESSION['MM_Username'] = NULL;
  $_SESSION['MM_UserGroup'] = NULL;
  $_SESSION['PrevUrl'] = NULL;
  unset($_SESSION['MM_Username']);
  unset($_SESSION['MM_UserGroup']);
  unset($_SESSION['PrevUrl']);
  $logoutGoTo = "index.php";
  if ($logoutGoTo) {
    header("Location: $logoutGoTo");
    exit;
  }
}
?>
<?php
  session_start();
if (!function_exists("GetSQLValueString")) {
function GetSQLValueString($theValue, $theType, $theDefinedValue = "", $theNotDefinedValue = "")
{
  if (PHP_VERSION < 6) {
    $theValue = get_magic_quotes_gpc() ? stripslashes($theValue) : $theValue;
  }

  $theValue = function_exists("mysql_real_escape_string") ? mysql_real_escape_string($theValue) :
mysql_escape_string($theValue);

  switch ($theType) {
    case "text":
      $theValue = ($theValue != "") ? "'" . $theValue . "'" : "NULL";
      break;
    case "long":
    case "int":
      $theValue = ($theValue != "") ? intval($theValue) : "NULL";
      break;
    case "double":
      $theValue = ($theValue != "") ? doubleval($theValue) : "NULL";
      break;
    case "date":
      $theValue = ($theValue != "") ? "'" . $theValue . "'" : "NULL";
      break;
    case "defined":
      $theValue = ($theValue != "") ? $theDefinedValue : $theNotDefinedValue;
      break;
  }
  return $theValue;
}
}
$colname_que_ans = "-1";
if (isset($_SESSION['MM_Username'])) {
  $colname_que_ans = $_SESSION['MM_Username'];
}
mysql_select_db($database_connection, $connection);
$query_que_ans = sprintf("SELECT id, student_id, title, question, answer, ans_by, `date` FROM
question_answer WHERE student_id = %s", GetSQLValueString($colname_que_ans, "text"));
```

```
$que_ans = mysql_query($query_que_ans, $connection) or die(mysql_error());
$row_que_ans = mysql_fetch_assoc($que_ans);
$totalRows_que_ans = mysql_num_rows($que_ans);
$db = mysql_connect("localhost", "root", "");
mysql_select_db("elearning",$db);
$who = $_SESSION['MM_Username'];
$result = mysql_query("SELECT grade FROM students where student_id = '$who'",$db);
while ($myrow = mysql_fetch_array($result))
{
$privilege = $myrow["grade"];
        switch ($privilege) {
                case '4activist':
                        $link = '4activist_view.php';
                        $link1 = 'img/4activist_image.php';
                        //header ("location: 4activist_view.php");
                        break;
                case '3reflector':
                $link = '3reflector_view.php';
                        $link1 = 'img/3reflector_image.php';
                        //header ("location: 3reflector_view.php");
                        break;
                case '2theorist':
                $link = '2theorist_view.php';
                        $link1 = 'img/2theorist_image.php';
      //header ("location: 2theorist_view.php");
                        break;
                case '1pragmatis':
                                $link = '1pragmatist_view.php';
                                                $link1 = 'img/1pragmatist_image.php';
//                      header ("location: 1pragmatist_view.php");
                        break;
                case 'default':
                                        $link = 'default_view.php';
                                                                $link1 = 'img/default_image.php';
//                      header ("location: default_view.php");
                        break;
                        // if you dont belong to a learning group
                        //default:
                        //header ("location: students.php");
        }
}
?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />
<title>Personalized E- Learning System :: Students</title>
<link href="style.css" rel="stylesheet" type="text/css" />
<style type="text/css">
<!--
.style1 {color: #FF0000}
-->
</style>
</head>
<body>
        <div id="header">
```

```
</div>
        <div id="topNav">
    <ul>
      <li><a href="index.php" title="Home">Home</a></li>
      <li><a href="tutor/tutor.php" title="Tutor" >Tutor</a></li>
      <li><a href="students.php" title="Students" class="hover">Students</a></li>
      <li><a href="support.php" title="Help &amp;amp; Support">Help &amp;amp; Support</a></li>
      <li><a href="contact.php" title="Contact">Contact Us</a></li>
    </ul>
          <p> </p>
          <p> </p>
          <table width="712" border="0" align="center">
            <tr>
              <td width="51" align="center" bgcolor="#DBEDF6"><a href="<?php echo $logoutAction
?>">LOGOUT</a></td>
              <td width="168" align="center" bgcolor="#DBEDF6"><a href="<?php echo "$link";
?>">View  Learning Materials</a></td>
              <td width="95" align="center" bgcolor="#DBEDF6"><a href="<?php echo "$link1";
?>">View Image </a></td>
              <td width="122" align="center" bgcolor="#DBEDF6"><a href="ask_question.php">Ask
Question</a></td>
              <td width="254" align="center" bgcolor="#DBEDF6"><center>
                <form method="get" action="http://www.google.com/search">
                  <table bgcolor="#FFFFFF">
                    <tr>
                      <td><input type="text" name="q" size="25" maxlength="255" value="" />
                        <input name="search" type="submit" id="search" value="Search" /></td>
          </tr>
        </table>
      </form>
              </center></td>
      </tr>
    </table>
          <p> </p>
</div>
<p> </p>
<p> </p>
<p> </p>
<div id="body">
          <table width="100%">
            <tr>
              <td colspan="5">Question Manager</td>
      </tr>
            <tr bgcolor="#D6D6D6">
              <td width="4%" align="center">Q/ id</td>
              <td width="13%" align="center">Title</td>
              <td width="38%" align="center">Questions</td>
<td width="35%" align="center">Answered By</td>
              <td width="10%" align="center">view answer</td>
      </tr>
      <?php $count = 1 ;?>
            <?php do { ?>
      <tr bgcolor="#DEEEF7">
        <td><?php echo $count ++ ; ?></td>
        <td><?php echo $row_que_ans['title']; ?></td>
        <td><?php echo $row_que_ans['question']; ?></td>
        <td><?php echo $row_que_ans['ans_by']; ?></td>
```

```
        <td        align="center"><a        href="view_answer.php?id=<?php        echo        $row_que_ans['id'];
?>">view</a></td>
      </tr>
            <?php } while ($row_que_ans = mysql_fetch_assoc($que_ans)); ?>
    </table>
          <p> </p>
          <p> </p>
          <p> </p>
          <p> </p>
          <p> </p>
          <p> </p>
</div>
          <div id="footer">
<div class="footer">
          <ul>
                                    <div align="center">Ahmadu Bello University, Zaria © 2010 </div>
          </ul>
          <p align="center">By AMAH MATHEW NGOZI<br />
M.Sc/SCIE/00394/2006-07</p>
</div>
</div>
</body>
</html>
<?php
mysql_free_result($que_ans);
?>
```

Ask Question

```
<?php require_once('Connections/connection.php'); ?>
<?php
//initialize the session
if (!isset($_SESSION)) {
  session_start();
}
// ** Logout the current user. **
$logoutAction = $_SERVER['PHP_SELF']."?doLogout=true";
if ((isset($_SERVER['QUERY_STRING'])) && ($_SERVER['QUERY_STRING'] != "")){
  $logoutAction .="&". htmlentities($_SERVER['QUERY_STRING']);
}
if ((isset($_GET['doLogout'])) &&($_GET['doLogout']=="true")){
  //to fully log out a visitor we need to clear the session varialbles
  $_SESSION['MM_Username'] = NULL;
  $_SESSION['MM_UserGroup'] = NULL;
  $_SESSION['PrevUrl'] = NULL;
  unset($_SESSION['MM_Username']);
  unset($_SESSION['MM_UserGroup']);
  unset($_SESSION['PrevUrl']);
  $logoutGoTo = "index.php";
  if ($logoutGoTo) {
    header("Location: $logoutGoTo");
    exit;
  }
}
?>
<?php
if (!function_exists("GetSQLValueString")) {
function GetSQLValueString($theValue, $theType, $theDefinedValue = "", $theNotDefinedValue = "")
```

```
{
 if (PHP_VERSION < 6) {
   $theValue = get_magic_quotes_gpc() ? stripslashes($theValue) : $theValue;
 }
 $theValue = function_exists("mysql_real_escape_string") ? mysql_real_escape_string($theValue) :
mysql_escape_string($theValue);
 switch ($theType) {
   case "text":
     $theValue = ($theValue != "") ? "'" . $theValue . "'" : "NULL";
     break;
   case "long":
   case "int":
     $theValue = ($theValue != "") ? intval($theValue) : "NULL";
     break;
   case "double":
     $theValue = ($theValue != "") ? doubleval($theValue) : "NULL";
     break;
   case "date":
     $theValue = ($theValue != "") ? "'" . $theValue . "'" : "NULL";
     break;
   case "defined":
     $theValue = ($theValue != "") ? $theDefinedValue : $theNotDefinedValue;
     break;
 }
 return $theValue;
}
}
$colname_style = "-1";
if (isset($_SESSION['MM_Username'])) {
 $colname_style = $_SESSION['MM_Username'];
}
mysql_select_db($database_connection, $connection);
$query_style = sprintf("SELECT * FROM students WHERE student_id = %s",
GetSQLValueString($colname_style, "text"));
$style = mysql_query($query_style, $connection) or die(mysql_error());
$row_style = mysql_fetch_assoc($style);
$totalRows_style = mysql_num_rows($style);
$st = $row_style['grade'];
$editFormAction = $_SERVER['PHP_SELF'];
if (isset($_SERVER['QUERY_STRING'])) {
 $editFormAction .= "?" . htmlentities($_SERVER['QUERY_STRING']);
}
if ((isset($_POST["MM_insert"])) && ($_POST["MM_insert"] == "question")) {
 $insertSQL = sprintf("INSERT INTO question_answer (student_id, title, question, style) VALUES (%s,
%s, %s, %s)",
                GetSQLValueString($_POST['hiddenField'], "text"),
                GetSQLValueString($_POST['title'], "text"),
                GetSQLValueString($_POST['question'], "text"),
            GetSQLValueString($row_style['grade'], "text"));
 mysql_select_db($database_connection, $connection);
 $Result1 = mysql_query($insertSQL, $connection) or die(mysql_error());

 $insertGoTo = "Question Successfully Asked";
 if (isset($_SERVER['QUERY_STRING'])) {
   $insertGoTo .= (strpos($insertGoTo, '?')) ? "&" : "?";
   $insertGoTo .= $_SERVER['QUERY_STRING'];
 }
```

```
  //header(sprintf("Location: %s", $insertGoTo));
}
?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />
<title>Personalized E- Learning System</title>
<link href="style.css" rel="stylesheet" type="text/css" />
</head>
<body>
        <div id="header">
          </div>
<div id="topNav">
                    <ul>
                              <li><a href="" title="Home">Home</a></li>
                              <li><a href="tutor/tutor.php" title="Tutor">Tutor</a></li>
                              <li><a href="students.php" title="Students" class="hover">Students</a></li>
                              <li><a href="support.php" title="Help & Support">Help & Support</a></li>
                              <li><a href="contact.php" title="Contact">Contact Us</a></li>
                    </ul>
  <p> </p>
                    <p> </p>
                    <table width="315" border="0" align="center">
                      <tr>
                        <td width="51" align="center" bgcolor="#DBEDF6"><a href="<?php echo
$logoutAction ?>">LOGOUT</a></td>
                        <td width="254" align="center" bgcolor="#DBEDF6"><center>
                          <form method="get" action="http://www.google.com/search">
                            <table bgcolor="#FFFFFF">
                              <tr>
                                <td><input type="text" name="q" size="25" maxlength="255" value="" />
                                  <input name="search" type="submit" id="search" value="Search" /></td>
                    </tr>
                  </table>
                </form>
                        </center></td>
              </tr>
  </table>
                    <p> </p>
</div>
<br />
<div id="body"><br />
  <fieldset>
    <legend><strong>Ask a Question</strong></legend>
    <form id="question" name="question" method="POST" action="<?php echo $editFormAction; ?>">
      <table width="513" height="222" border="0" align="center">
        <tr>
          <td colspan="2" align="center"><h1><?php echo $insertGoTo; ?></h1></td>
        </tr>
        <tr>
          <td width="118" align="right"><strong>Title:</strong></td>
          <td width="385"><strong>
            <input type="text" name="title" id="title" />
          </strong></td>
        </tr>
```

```
      <tr>
        <td align="right" valign="middle"><strong>Question:</strong></td>
        <td><strong>
          <label>
            <textarea name="question" id="question" cols="45" rows="5"></textarea>
          </label>
        </strong></td>
      </tr>
      <tr>
        <td align="right"><input name="hiddenField" type="hidden" id="hiddenField" value="<?php echo
$_SESSION['MM_Username'] ; ?>" /></td>
        <td><strong>
          <label>
            <input type="submit" name="button" id="button" value="Ask Question" />
          </label>
        </strong></td>
      </tr>
    </table>
    <p>
      <label></label>
    </p>
    <input type="hidden" name="MM_insert" value="question" />
  </form>
 </fieldset>
</div>

          <div id="footer">
<div class="footer">
          <ul>
                                        <div align="center">Ahmadu Bello University, Zaria © 2010 </div>
          </ul>
          <p align="center">By AMAH MATHEW NGOZI<br />
M.Sc/SCIE/00394/2006-07</p>
</div>
</div>
</body>
</html>
<?php
mysql_free_result($style);
?>
```

Tutor Login Success

```
<?php require_once('../Connections/connection.php'); ?>
<?php
//initialize the session
if (!isset($_SESSION)) {
  session_start();
}

// ** Logout the current user. **
$logoutAction = $_SERVER['PHP_SELF']."?doLogout=true";
if ((isset($_SERVER['QUERY_STRING'])) && ($_SERVER['QUERY_STRING'] != "")){
  $logoutAction .="&". htmlentities($_SERVER['QUERY_STRING']);
}
if ((isset($_GET['doLogout'])) &&($_GET['doLogout']=="true")){
  //to fully log out a visitor we need to clear the session varialbles
  $_SESSION['MM_Username'] = NULL;
  $_SESSION['MM_UserGroup'] = NULL;
```

```
  $_SESSION['PrevUrl'] = NULL;
  unset($_SESSION['MM_Username']);
  unset($_SESSION['MM_UserGroup']);
  unset($_SESSION['PrevUrl']);
  $logoutGoTo = "tutor.php";
  if ($logoutGoTo) {
    header("Location: $logoutGoTo");
    exit;
  }
}
?>
<?php
if (!isset($_SESSION)) {
  session_start();
}
$MM_authorizedUsers = "";
$MM_donotCheckaccess = "true";
// *** Restrict Access To Page: Grant or deny access to this page
function isAuthorized($strUsers, $strGroups, $UserName, $UserGroup) {
  // For security, start by assuming the visitor is NOT authorized.
  $isValid = False;
  // When a visitor has logged into this site, the Session variable MM_Username set equal to their username.
  // Therefore, we know that a user is NOT logged in if that Session variable is blank.
  if (!empty($UserName)) {
    // Besides being logged in, you may restrict access to only certain users based on an ID established when
they login.
    // Parse the strings into arrays.
    $arrUsers = Explode(",", $strUsers);
    $arrGroups = Explode(",", $strGroups);
    if (in_array($UserName, $arrUsers)) {
      $isValid = true;
    }
    // Or, you may restrict access to only certain users based on their username.
    if (in_array($UserGroup, $arrGroups)) {
      $isValid = true;
    }
    if (($strUsers == "") && true) {
      $isValid = true;
    }
  }
  return $isValid;
}
$MM_restrictGoTo = "tutor.php";
if (!((isset($_SESSION['MM_Username'])) && (isAuthorized("",$MM_authorizedUsers,
$_SESSION['MM_Username'], $_SESSION['MM_UserGroup'])))) {
  $MM_qsChar = "?";
  $MM_referrer = $_SERVER['PHP_SELF'];
  if (strpos($MM_restrictGoTo, "?")) $MM_qsChar = "&";
  if (isset($QUERY_STRING) && strlen($QUERY_STRING) > 0)
  $MM_referrer .= "?" . $QUERY_STRING;
  $MM_restrictGoTo = $MM_restrictGoTo. $MM_qsChar . "accesscheck=" . urlencode($MM_referrer);
  header("Location: ". $MM_restrictGoTo);
  exit;
}
?>
<?php
if (!function_exists("GetSQLValueString")) {
```

```
function GetSQLValueString($theValue, $theType, $theDefinedValue = "", $theNotDefinedValue = "")
{
 if (PHP_VERSION < 6) {
  $theValue = get_magic_quotes_gpc() ? stripslashes($theValue) : $theValue;
 }
 $theValue = function_exists("mysql_real_escape_string") ? mysql_real_escape_string($theValue) :
mysql_escape_string($theValue);
 switch ($theType) {
  case "text":
   $theValue = ($theValue != "") ? "'" . $theValue . "'" : "NULL";
   break;
  case "long":
  case "int":
   $theValue = ($theValue != "") ? intval($theValue) : "NULL";
   break;
  case "double":
   $theValue = ($theValue != "") ? doubleval($theValue) : "NULL";
   break;
  case "date":
   $theValue = ($theValue != "") ? "'" . $theValue . "'" : "NULL";
   break;
  case "defined":
   $theValue = ($theValue != "") ? $theDefinedValue : $theNotDefinedValue;
   break;
 }
 return $theValue;
}
}
$colname_edit_tutorprofile = "-1";
if (isset($_SESSION['MM_Username'])) {
 $colname_edit_tutorprofile = $_SESSION['MM_Username'];
}
mysql_select_db($database_connection, $connection);
$query_edit_tutorprofile = sprintf("SELECT * FROM tutor WHERE tutor_id = %s",
GetSQLValueString($colname_edit_tutorprofile, "text"));
$edit_tutorprofile = mysql_query($query_edit_tutorprofile, $connection) or die(mysql_error());
$row_edit_tutorprofile = mysql_fetch_assoc($edit_tutorprofile);
$totalRows_edit_tutorprofile = mysql_num_rows($edit_tutorprofile);
mysql_select_db($database_connection, $connection);
$query_activist_sub = "SELECT id, course_title FROM `4activist`";
$activist_sub = mysql_query($query_activist_sub, $connection) or die(mysql_error());
$row_activist_sub = mysql_fetch_assoc($activist_sub);
$totalRows_activist_sub = mysql_num_rows($activist_sub);
mysql_select_db($database_connection, $connection);
$query_reflector_sub = "SELECT id, course_title FROM `3reflector`";
$reflector_sub = mysql_query($query_reflector_sub, $connection) or die(mysql_error());
$row_reflector_sub = mysql_fetch_assoc($reflector_sub);
$totalRows_reflector_sub = mysql_num_rows($reflector_sub);
mysql_select_db($database_connection, $connection);
$query_theorist_sub = "SELECT id, course_title FROM `2theorist`";
$theorist_sub = mysql_query($query_theorist_sub, $connection) or die(mysql_error());
$row_theorist_sub = mysql_fetch_assoc($theorist_sub);
$totalRows_theorist_sub = mysql_num_rows($theorist_sub);
mysql_select_db($database_connection, $connection);
$query_pragmatist_sub = "SELECT id, course_title FROM `1pragmatist`";
$pragmatist_sub = mysql_query($query_pragmatist_sub, $connection) or die(mysql_error());
$row_pragmatist_sub = mysql_fetch_assoc($pragmatist_sub);
```

```
$totalRows_pragmatist_sub = mysql_num_rows($pragmatist_sub);
mysql_select_db($database_connection, $connection);
$query_default_sub = "SELECT id, course_title FROM defaul";
$default_sub = mysql_query($query_default_sub, $connection) or die(mysql_error());
$row_default_sub = mysql_fetch_assoc($default_sub);
$totalRows_default_sub = mysql_num_rows($default_sub);
mysql_select_db($database_connection, $connection);
$query_Qactivist = "SELECT * FROM question_answer WHERE style = '4activist'";
$Qactivist = mysql_query($query_Qactivist, $connection) or die(mysql_error());
$row_Qactivist = mysql_fetch_assoc($Qactivist);
$totalRows_Qactivist = mysql_num_rows($Qactivist);
mysql_select_db($database_connection, $connection);
$query_Qreflector = "SELECT * FROM question_answer WHERE style = '3reflector'";
$Qreflector = mysql_query($query_Qreflector, $connection) or die(mysql_error());
$row_Qreflector = mysql_fetch_assoc($Qreflector);
$totalRows_Qreflector = mysql_num_rows($Qreflector);
mysql_select_db($database_connection, $connection);
$query_Qtheorist = "SELECT * FROM question_answer WHERE style = '2theorist'";
$Qtheorist = mysql_query($query_Qtheorist, $connection) or die(mysql_error());
$row_Qtheorist = mysql_fetch_assoc($Qtheorist);
$totalRows_Qtheorist = mysql_num_rows($Qtheorist);
mysql_select_db($database_connection, $connection);
$query_Qpragmatist = "SELECT * FROM question_answer WHERE style = '1pragmatist'";
$Qpragmatist = mysql_query($query_Qpragmatist, $connection) or die(mysql_error());
$row_Qpragmatist = mysql_fetch_assoc($Qpragmatist);
$totalRows_Qpragmatist = mysql_num_rows($Qpragmatist);
?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />
<title>Personalized E- Learning System :: Students</title>
<link href="../style.css" rel="stylesheet" type="text/css" />
<style type="text/css">
<!--
.style2 {color: #990000}
-->
</style>
</head>
<body>
        <div id="header">            </div>


        <div id="topNav">
    <ul>
      <li><a href="" title="Home">Home</a></li>
      <li><a href="tutor.php" title="Tutor" class="hover">Tutor</a></li>
      <li><a href="../students.php" title="Students">Students</a></li>
      <li><a href="../support.php" title="Help &amp; Support">Help &amp; Support</a></li>
      <li><a href="../contact.php" title="Contact">Contact Us</a></li>
    </ul>
          <p> </p>
          <p> </p>
          <p> </p>
</div>
<div id="body">
```

```
 <table width="95%" border="0" align="center">
  <tr>
   <td height="182" colspan="6" valign="top"><fieldset>
    <legend><a href="<?php echo $logoutAction ?>">Logout</a></legend>
    <table width="611" height="200" border="0" align="center">
     <tr>
      <td width="605" height="196" align="center" valign="middle"><p> </p>
       <p><strong>You Have Successful Logged in</strong> <a href="edit_tutorprofile.php?tutor_id=<?php echo $row_edit_tutorprofile['tutor_id']; ?>">Edit Profie</a></p>
        <table width="546" border="0">
         <tr>
          <td align="left" bgcolor="#CCCCCC"> </td>
         </tr>
         <tr>
          <td align="left" bgcolor="#CCCCCC">Edit  Learning Material</td>
         </tr>
         <tr>
          <td align="left"><strong>Activist</strong></td>
         </tr>
         <tr>
          <td align="left">
           <table width="100%">
            <?php do { ?>
             <tr bgcolor="#EEF6FB">
              <td height="21"> Topic <strong>:</strong> <a href="../4activist.php?id=<?php echo $row_activist_sub['id']; ?>" class="style2"><?php echo $row_activist_sub['course_title']; ?></a></td>
             </tr>
            <?php } while ($row_activist_sub = mysql_fetch_assoc($activist_sub)); ?>
           </table></td>
         </tr>
         <tr>
          <td width="540" align="left"><strong>Reflector</strong></td>
         </tr>
         <tr>
          <td align="left">
           <table width="100%">
            <?php do { ?>
             <tr>
              <td bgcolor="#EEF6FB">Topic :<a href="../3reflector.php?id=<?php echo $row_reflector_sub['id']; ?>"><?php echo $row_reflector_sub['course_title']; ?></a></td>
             </tr>
            <?php } while ($row_reflector_sub = mysql_fetch_assoc($reflector_sub)); ?>
           </table></td>
         </tr>
         <tr>
          <td align="left"><strong>Theorist</strong></td>
         </tr>
         <tr>
          <td align="left"><table width="100%">

           <?php do { ?>
            <tr>
             <td bgcolor="#EEF6FB">Topic:<a href="../2theorist.php?id=<?php echo $row_theorist_sub['id']; ?>"> <?php echo $row_theorist_sub['course_title']; ?></a></td>
            </tr>
           <?php } while ($row_theorist_sub = mysql_fetch_assoc($theorist_sub)); ?>
```

```
            </table></td>
          </tr>
          <tr>
            <td align="left"><strong>Pragmatist</strong></td>
          </tr>
          <tr>
            <td align="left" bgcolor="#EEF6FB">
              <table>
                <?php do { ?>
                  <tr>
                    <td>Topic: <a href="../1pragmatist.php?id=<?php echo $row_pragmatist_sub['id']; ?>"><?php echo $row_pragmatist_sub['course_title']; ?></a></td>
                  </tr>
                <?php } while ($row_pragmatist_sub = mysql_fetch_assoc($pragmatist_sub)); ?>
              </table></td>
          </tr>
          <tr>
            <td align="left"><strong>Default</strong></td>
          </tr>
          <tr>
            <td align="left"><table width="100%">
                <?php do { ?>
                  <tr>
                    <td bgcolor="#EEF6FB">Topic : <a href="../default.php?id=<?php echo $row_default_sub['id']; ?>"><?php echo $row_default_sub['course_title']; ?></a></td>
                  </tr>
                <?php } while ($row_default_sub = mysql_fetch_assoc($default_sub)); ?>
              </table></td>
          </tr>
        </table>
        <table width="546" border="0">
          <tr>
            <td colspan="3" bgcolor="#CCCCCC"><strong>Question and Answer</strong></td>
            </tr>
          <tr>
            <td width="66"><strong>Activist</strong></td>
            <td width="412"> </td>
            <td width="54"> </td>
          </tr>
          <?php do { ?>
            <tr bgcolor="#EEF6FB">
              <td align="right">Question:</td>
              <td><?php echo $row_Qactivist['question']; ?></td>
              <td><a href="tutor_answer.php?id=<?php echo $row_Qactivist['id']; ?>">Answer</a></td>
            </tr>
            <?php } while ($row_Qactivist = mysql_fetch_assoc($Qactivist)); ?>
<tr>
  <td><strong>Reflector</strong></td>
            <td> </td>
            <td> </td>
          </tr>
          <tr bgcolor="#EEF6FB">
            <td align="right">Question:</td>
            <td><?php echo $row_Qreflector['question']; ?></td>
            <td><a href="tutor_answer.php?id=<?php echo $row_Qreflector['id']; ?>">Answer</a></td>
          </tr>
          <tr>
```

```
            <td><strong>Theorist</strong></td>
            <td> </td>
            <td> </td>
          </tr>
          <?php do { ?>
            <?php do { ?>
              <tr bgcolor="#EEF6FB">
                <td align="right">Question:</td>
                <td><?php echo $row_Qtheorist['question']; ?></td>
                <td><a href="tutor_answer.php?id=<?php echo $row_Qtheorist['id']; ?>">Answer</a></td>
              </tr>
              <?php } while ($row_Qtheorist = mysql_fetch_assoc($Qtheorist)); ?>
            <?php } while ($row_Qreflector = mysql_fetch_assoc($Qreflector)); ?>
          <tr>
            <td><strong>Pragmatist</strong></td>
            <td> </td>
            <td> </td>
          </tr>
          <?php do { ?>
            <tr bgcolor="#EEF6FB">
              <td align="right">Question:</td>
              <td><?php echo $row_Qpragmatist['answer']; ?></td>
              <td><a href="tutor_answer.php?id=<?php echo $row_Qpragmatist['id'];
?>">Answer</a></td>
            </tr>
            <?php } while ($row_Qpragmatist = mysql_fetch_assoc($Qpragmatist)); ?>
<tr>
  <td> </td>
            <td> </td>
            <td> </td>
          </tr>
          <tr>
            <td> </td>
            <td> </td>
            <td> </td>
          </tr>
        </table>
        <p> </p>
      </tr>
    </table>
    </fieldset>
    </td>
   </tr>
  </table>
</div>

        <div id="footer">
<div class="footer">
        <ul>
                                <div align="center">Ahmadu Bello University, Zaria © 2010 </div>
        </ul>
        <p align="center">By AMAH MATHEW NGOZI<br />
M.Sc/SCIE/00394/2006-07</p>
</div>
</div>
</body>
</html>
```

```
<?php
mysql_free_result($edit_tutorprofile);
mysql_free_result($activist_sub);
mysql_free_result($reflector_sub);
mysql_free_result($theorist_sub);
mysql_free_result($pragmatist_sub);
mysql_free_result($default_sub);
mysql_free_result($Qactivist);
mysql_free_result($Qreflector);
mysql_free_result($Qtheorist);
mysql_free_result($Qpragmatist);
?>
```

Tutor Answer

```
<?php require_once('../Connections/connection.php'); ?>
<?php
//initialize the session
if (!isset($_SESSION)) {
  session_start();
}
// ** Logout the current user. **
$logoutAction = $_SERVER['PHP_SELF']."?doLogout=true";
if ((isset($_SERVER['QUERY_STRING'])) && ($_SERVER['QUERY_STRING'] != "")){
  $logoutAction .="&". htmlentities($_SERVER['QUERY_STRING']);
}
if ((isset($_GET['doLogout'])) &&($_GET['doLogout']=="true")){
  //to fully log out a visitor we need to clear the session varialbles
  $_SESSION['MM_Username'] = NULL;
  $_SESSION['MM_UserGroup'] = NULL;
  $_SESSION['PrevUrl'] = NULL;
  unset($_SESSION['MM_Username']);
  unset($_SESSION['MM_UserGroup']);
  unset($_SESSION['PrevUrl']);
  $logoutGoTo = "tutor.php";
  if ($logoutGoTo) {
    header("Location: $logoutGoTo");
    exit;
  }
}
?>
<?php
$d =  $_GET['id'] ;
if (!isset($_SESSION)) {
  session_start();
}
$MM_authorizedUsers = "";
$MM_donotCheckaccess = "true";
// *** Restrict Access To Page: Grant or deny access to this page
function isAuthorized($strUsers, $strGroups, $UserName, $UserGroup) {
  // For security, start by assuming the visitor is NOT authorized.
  $isValid = False;
  // When a visitor has logged into this site, the Session variable MM_Username set equal to their username.
  // Therefore, we know that a user is NOT logged in if that Session variable is blank.
  if (!empty($UserName)) {
    // Besides being logged in, you may restrict access to only certain users based on an ID established when
they login.
    // Parse the strings into arrays.
```

```
    $arrUsers = Explode(",", $strUsers);
    $arrGroups = Explode(",", $strGroups);
    if (in_array($UserName, $arrUsers)) {
      $isValid = true;
    }
    // Or, you may restrict access to only certain users based on their username.
    if (in_array($UserGroup, $arrGroups)) {
      $isValid = true;
    }
    if (($strUsers == "") && true) {
      $isValid = true;
    }
  }
  return $isValid;
}
$MM_restrictGoTo = "tutor.php";
if (!((isset($_SESSION['MM_Username'])) && (isAuthorized("",$MM_authorizedUsers,
$_SESSION['MM_Username'], $_SESSION['MM_UserGroup'])))) {
  $MM_qsChar = "?";
  $MM_referrer = $_SERVER['PHP_SELF'];
  if (strpos($MM_restrictGoTo, "?")) $MM_qsChar = "&";
  if (isset($QUERY_STRING) && strlen($QUERY_STRING) > 0)
  $MM_referrer .= "?" . $QUERY_STRING;
  $MM_restrictGoTo = $MM_restrictGoTo. $MM_qsChar . "accesscheck=" . urlencode($MM_referrer);
  header("Location: ". $MM_restrictGoTo);
  exit;
}
?>
<?php
if (!function_exists("GetSQLValueString")) {
function GetSQLValueString($theValue, $theType, $theDefinedValue = "", $theNotDefinedValue = "")
{
  if (PHP_VERSION < 6) {
    $theValue = get_magic_quotes_gpc() ? stripslashes($theValue) : $theValue;
  }
  $theValue = function_exists("mysql_real_escape_string") ? mysql_real_escape_string($theValue) :
mysql_escape_string($theValue);
  switch ($theType) {
    case "text":
      $theValue = ($theValue != "") ? "'" . $theValue . "'" : "NULL";
      break;
    case "long":
    case "int":
      $theValue = ($theValue != "") ? intval($theValue) : "NULL";
      break;
    case "double":
      $theValue = ($theValue != "") ? doubleval($theValue) : "NULL";
      break;
    case "date":
      $theValue = ($theValue != "") ? "'" . $theValue . "'" : "NULL";
      break;
    case "defined":
      $theValue = ($theValue != "") ? $theDefinedValue : $theNotDefinedValue;
      break;
  }
  return $theValue;
}
```

```
}
$editFormAction = $_SERVER['PHP_SELF'];
if (isset($_SERVER['QUERY_STRING'])) {
  $editFormAction .= "?" . htmlentities($_SERVER['QUERY_STRING']);
}
if ((isset($_POST["MM_update"])) && ($_POST["MM_update"] == "answer")) {
  $updateSQL = sprintf("UPDATE question_answer SET answer=%s, ans_by=%s WHERE id=%s",
                       GetSQLValueString($_POST['ans'], "text"),
                       GetSQLValueString($_POST['by'], "text"),
                       GetSQLValueString($_POST['hiddenField'], "int"));
  mysql_select_db($database_connection, $connection);
  $Result1 = mysql_query($updateSQL, $connection) or die(mysql_error());

  $updateGoTo = "Question Answered Successfully";
  if (isset($_SERVER['QUERY_STRING'])) {
    $updateGoTo .= (strpos($updateGoTo, '?')) ? "&" : "?";
    $updateGoTo .= $_SERVER['QUERY_STRING'];
  }
  //header(sprintf("Location: %s", $updateGoTo));
}
$colname_edit_tutorprofile = "-1";
if (isset($_SESSION['MM_Username'])) {
  $colname_edit_tutorprofile = $_SESSION['MM_Username'];
}
mysql_select_db($database_connection, $connection);
$query_edit_tutorprofile = sprintf("SELECT * FROM tutor WHERE tutor_id = %s",
GetSQLValueString($colname_edit_tutorprofile, "text"));
$edit_tutorprofile = mysql_query($query_edit_tutorprofile, $connection) or die(mysql_error());
$row_edit_tutorprofile = mysql_fetch_assoc($edit_tutorprofile);
$totalRows_edit_tutorprofile = mysql_num_rows($edit_tutorprofile);
$sn = $row_edit_tutorprofile['surname'];
$fn = $row_edit_tutorprofile['firstname'];
$who = "$sn" . " $fn" ;
?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1" />
<title>Personalized E- Learning System :: Students</title>
<link href="../style.css" rel="stylesheet" type="text/css" />
<style type="text/css">
<!--
.style2 {color: #990000}
-->
</style>
</head>
<body>
        <div id="header">            </div>
        <div id="topNav">
    <ul>
      <li><a href="" title="Home">Home</a></li>
      <li><a href="tutor.php" title="Tutor" class="hover">Tutor</a></li>
      <li><a href="../students.php" title="Students">Students</a></li>
      <li><a href="../support.php" title="Help &amp;amp; Support">Help &amp;amp; Support</a></li>
      <li><a href="../contact.php" title="Contact">Contact Us</a></li>
    </ul>
```

```
            <p> </p>
            <p> </p>
            <p> </p>
</div>
<div id="body">
  <table width="95%" border="0" align="center">
    <tr>
      <td height="182" colspan="6" valign="top"><fieldset>
        <legend><a href="<?php echo $logoutAction ?>">Logout</a></legend>
        <table width="611" height="200" border="0" align="center">
          <tr>
            <td width="605" height="196" align="center" valign="top"><p> </p>
              <p><strong>You Have Successful Logged in</strong> <a
href="edit_tutorprofile.php?tutor_id=<?php echo $row_edit_tutorprofile['tutor_id']; ?>">Edit
Profie</a></p>
              <form id="answer" name="answer" method="POST" action="<?php echo $editFormAction; ?>">
              <table width="424" height="176" border="0">
                <tr>
                  <td colspan="2" align="center"><strong><?php echo $updateGoTo; ?></strong></td>
                  </tr>
                <tr>
                  <td>Answer:</td>
                  <td><p>
                    <label>
                      <textarea name="ans" id="ans" cols="45" rows="5"></textarea>
                    </label>
                  </p>
                    <p>  </p></td>
                  </tr>
                <tr>
                  <td> </td>
                  <td><label>
                    <input type="submit" name="button" id="button" value="Answer Question" />
                    <input name="by" type="hidden" id="by" value="<?php echo $who;?>" />
                    <input name="hiddenField" type="hidden" id="hiddenField" value="<?php echo $d ; ?>" />
                  </label></td>
                  </tr>
              </table>
              <input type="hidden" name="MM_update" value="answer" />
              </form>
<p> </p>
            </tr>
      </table>
      </fieldset>
      </td>
    </tr>
  </table>
</div>
            <div id="footer">
<div class="footer">
            <ul>
                                        <div align="center">Ahmadu Bello University, Zaria © 2010 </div>
            </ul>
            <p align="center">By AMAH MATHEW NGOZI<br />
M.Sc/SCIE/00394/2006-07</p>
</div>
</div>
```

```
</body>
</html>
<?php
mysql_free_result($edit_tutorprofile);
?>
```