Online Academic Discussion System in Ibanda Univerisity

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ABSTRACT

Universities are exploring pedagogical approaches to learning in order to deal with challenges such as increased class sizes, limited funding support, and difficulties in facilitating and encouraging active participation and learning among a diverse cohort of students. This paper reports on a study of the effectiveness of a pedagogical approach that blends online discussion board and case study. Analyzing the quantity and quality of online postings and comparing accounting students' performance with previous cohorts, this study observes a significant improvement in student learning. Appropriate design and delivery strategies and clear assessment criteria for assessment and use have provided an effective learning vehicle for students, helped them overcome their own language-related barriers and encouraged them to participate in a non-threatening environment. This approach further complemented the benefits of peer-to-peer learning and case study pedagogy. Reported increases in workload for students and marking load for academics and measuring the values of learning, however, are some of the challenges that need further attention by researchers. The system has been designed to do a whole lot more than just reduce class discussions. It can make a significant contribution to a University's learning and performance among the students. Online academic discussion systems make it possible for students to conduct discussions online, which helps them to boost their learning. The main purpose of developing this system is to provide effective discussions that increase critical thinking among the students.
Keywords: Online discussion, Students Learning, language-related barriers, Nonthreatening environment, Discussions online.

INTRODUCTION

Ibanda University is a private university located in the Ibanda district of Uganda which has made a name in Uganda's education sector with remarkable resilience. Currently, students of Ibanda University are using face-to-face interaction in conducting discussions. With Online discussion forums, classroom conversations and learning was extended by getting students to engage with class material online in different departments based on the kind of questions raised [1-3]. Online discussions are often arranged by discussion boards and forums. In the online discussion forums literature, there is a lot of emphasis on the benefits that online discussion forums can have and how learners can be more involved in online interaction. Let's take a step back and think about the wonders of modern technology for one second [4]. The web has made it possible to participate in near-instant communication on a global scale. In almost every corner of the Internet, you have people talking to one another: news sites, blogs, Facebook, YouTube, email, forums, and more.

Statement of Problem

The students have to be present on condition that means students compulsory have to go to campus and normal increase of class sizes so that the moment the online academic discussion forum is introduced, there is a desire for

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conducting discussions. Through online forums, students will be enabled to conduct discussions on course-related topics with each other, by use of their Internet connection. Other than in fully online courses, their adoption in traditional learning environments complementing face-to-face teaching increased and become a common educational strategy in higher education. In fact, interest in using online discussion forums as an indicator of students' performance increased. Online discussion forums are expected to enable flexible and independent learning and knowledge construction and develop critical thinking skills. There are many advantages of its use, students use of online discussion forums in the context of their study and the characteristics of an effective online discussion environment that facilitate effective learning need to be investigated. The main purpose of this research is to develop a one-roof platform for effective interaction, effective exposure, and the right direction toward communication. The researcher's aim is to provide our users with an opportunity to enhance their knowledge by sharing their views on this platform by having discussions with other users.

Aim

The general objective was to develop an online academic discussion system for effective discussions and independent learning and knowledge construction and develop critical thinking skills among the students.

Specific Objectives

I. To study and analyze the current discussion system at Ibanda University.
II. To establish requirements for designing a system for online academic discussions.
III. To design and develop a system for online academic discussions.
IV. To test and implement an online academic discussion system at Ibanda University to ensure effective learning.

Research Questions

I. What does it take to design and develop a system for online academic discussions?
II. What does it take to test and implement an online academic discussion system at Ibanda University?
III. How can the current discussion system at Ibanda University be studied and analyzed?

METHODOLOGY

Research Design

The study design is a cross-sectional design that is descriptive in nature, using the quantitative approach in order to determine the impacts of the current system of academic discussions on students of Ibanda University and whether there is a need for improvement.

Area of Study

The study was conducted to identify the need for an online academic discussion system in the Ibanda district at Ibanda University. The study area enabled the collection of data at one point in time but from different offices and people at the university.

Study Population

The study population included 30 employees and 500 students of the university. The students and employers were considered because they have enough detailed information on the advantages and disadvantages of the existing system.

Sample Size

It is an important feature of any empirical study in which the goal is to make inferences about a population from a sample.
The sample size was estimated using the formula (Sloven's formula)

$$n = \frac{N}{1+N(e^2)}$$

Where: **n** is the sample size; **N** is the sample population; **e** is the marginal error which is constantly **0.05**

The sample size for the student sample size for employees

$$n = N \qquad n = \frac{N}{1+N(e^2)}$$

$$n = \frac{N}{1+N\ (e^2)}$$

$$n = \frac{500}{1+500(0.05^2)}$$

$$= \frac{500}{2.25} = \textbf{222 students}$$

$$n = \frac{30}{1+30(0.05^2)} = \textbf{28 employees}$$

The sample size for students and employees = 222+28 = 250 according to Sloven's formula.

Data Collection Methods

These are the methods used to collect information from different areas. The researcher used interviews and questionnaires in collecting data from different respondents.

Interview

The researcher conducted face to face g with the students and employees. An interview was designed and guiding questions were prepared which also act as a tool for collecting data. The interview was conducted using the study for lectures and students who study at the university.

Documentary Review

Documentary review is the critical examination of public or private recorded information related to the issue under investigation [5]. The researcher accessed documents like journals, News studies, Development plans, assessment reports, and internet sources to provide qualitative data on the institution. Secondary data was collected from scholarly journals, government documents, conference papers, research papers, published books and recognized Websites.

Questionnaire

The questionnaire technique helped the researcher to collect data in a far distant place that would require a lot of resources. For that matter, questionnaires were designed based on sample size and distributed to respective individuals that are (lecturers and students) in the chosen sample for answering. This is the dominant primary data collection method in the study. This helps the researcher to get information from different questionnaires. A questionnaire is a carefully designed instrument for collecting data in accordance with the specifications of the research questions and hypotheses. It consists of questions to which the subject responds in writing [6]. A questionnaire was used because it is easy to administer, relatively cheap, questions are standardized, and results can easily be quantified and allow anonymity [7].

Data Analysis Tools

Students' responses to each of the questions were the primary data used in this study. This data was analyzed by two persons independent of each other—the author/facilitator and a research assistant. This research assistant was a qualified educator, who specialized in online learning and was working in the teaching and learning unit of the business school. The objective of this analysis was to assess the quality of responses and online discussion interaction. Rather than positioning the discussion interaction as a dependent variable along with the learning outcomes, a post hoc measurement approach was used in this study. According to this, the discussion interaction and quality of the responses were considered independent variables in relation to learning outcomes. Barron suggests two alternative ways of conducting content analysis. The first approach involves qualitative analysis of the discussion and the second approach focuses on the responses related to proposed solutions to the case study questions. This second approach was adopted in this study which involves qualitative analysis of the student responses [8]. The quality of responses by each of the students for each question was analyzed for assessment purposes as well as for evidence to support learning. While the first approach helped in awarding assessment marks to each of the responses, the second approach helped in identifying any evidence for peer-to-peer and collaborative learning, data analysis skills, using and citing other sources, pooling of different ideas, and building on others' contributions. A comparison of the analysis revealed 81% consistency in the rating of both evaluators. The remaining 19% of the responses were subsequently reevaluated jointly in order to arrive at a consensus assessment mark and evidence. In addition to students' responses, their perception of the entire process was also collected using semi-structured interviews. The approach taken in the analysis was to analyze the responses of students to semi-structured questions, to examine their feedback on the effectiveness of this online assessment task, and to assess its pedagogical benefits. Further in the interviews, participants were asked to give their views on the structure of the learning environment including

the online discussion forum, appropriateness of the weightage assigned to this assessment task, timing and level of difficulty of the case study questions, and participation by the academic as a moderator and their perception of collaborative and peer-to-peer learning. From a total sample of 28 employees, 20 employees volunteered to be interviewed and provided qualitative feedback.

Study Design Structure

Admin Module
"This was a Master' creation Module. It looked after and controlled all the discussions being created and posted. Once the discussions are created and posted the admin has the authority to see and alter those discussions."

Registration Module
"This module is responsible for the registration of a new user. In this module, the user registers by entering the required information. This module also verifies the new user details with the previously registered users."

Profile Management Module
"This module manages the profiles of all the registered users. In this module
All the details of the registered users are stored. It creates a separate record for individual users about all the discussion being created and posted."

Discussion Module
"This module manages the discussions created by the corresponding users.
It helps the user to have discussions with each other. This module helps in managing all the discussions amongst different users." http://www.aspsnippets.com/

System Design

The system design was based on the outcomes of the phase, and it includes software and hardware design making trade by trading in consideration of any constraints from those outcomes. At the time the test plan was prepared the d, test plan described the various tests which were carried out on the system after completion of development [9].

Development Tools

Wamp server is a web development platform on Windows that allows for the creation of dynamic web applications with Apache2, PHP and MYSQL [10]. HTML which is a standard markup language for creating web pages. CCS is another tool that helps in styling HTML documents, while PHP is also another tool that helps in making dynamic web pages. And finally, Macromedia Dreamweaver CS6 is a web design and development tool which combines both visual surface and code editor with standard features such as syntax.

Ethical Considerations

Prior to the study, a researcher obtained an introductory letter from the faculty of science and technology after which he took to Ibanda University to gain permission to collect data. Data collected was kept confidential and the names of respondents did not appear in the questionnaire. At the end of the data collection notes were taken and the documents collected were compiled and put together which helped the researcher in data processing.

RESULTS
System Analysis
Definition
System Analysis is the detailed study of the various operations performed by the system and their relationships within and outside the system. Analysis is the process of breaking something into its parts so that the whole may be understood. System analysis is concerned with becoming aware of the problem, identifying the relevant and most decisional variables, analyzing and synthesizing the various factors and determining an optional or at least a satisfactory solution.

Description of Existing System
Currently Ibanda University, Students conduct academic discussions physically that are face to face whereby they use pens and papers to write down answers and questions raised.

Data Analysis and Presentation

The researcher used questionnaires where most of the correspondents including the students and employees were requested to answer some questions related to the current academic discussion system, how it works and challenges being encountered while using it. The researcher found out that the current system of academic discussion system

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was not perfect for both students and employees of Ibanda University. The researcher was able to meet the following categories of system users in regard to their Gender.

Table 1: showing the respondent's Gender balance

Gender	No. of respondents	% age
Female	100	40%
Male	150	60%
Total	**250**	**100%**

Source: field data

In regard to Gender in Table 1   above, the researcher also found out that males were more than females whereby 50 males and 100 females respectively.

The student's Questionnaire results about the wish to have an online academic discussion system are presented in the table as follows:

Table 2: showing the rating of the current system

Question	No. of respondents		Total
Do you wish to have an online academic discussion system?			
	Yes	No	
Number of respondents	160	90	**250**
% age	64%	36%	**100%**

Source: field data

CONCLUSION

Many respondents checked yes meaning that they would like to use another method.

The employees' questionnaire results about the challenges of the current system are presented in the table as follows:

Table 3: Results of the challenges of the current system

Question	No. of respondents		Total
What are the challenges of using the current method of academic discussion system?			
	Yes	No	
No. of respondents (f)	110	140	**250**
% age	44%	56%	**100%**

Source: field data

In regard to table 3 above, it shows that a new method of academic discussion was necessary to be put in place giving a researcher a go head to carry out this with a new system that conducts discussions online based on the number of respondents that felt uncomfortable with the existing system.

CONCLUSION

Based on the number of respondents that felt uncomfortable with the current discussion system and basing number of respondents who believed the online academic discussion system would be a perfect alternative to the current system, the researcher had to go ahead with designing and implementing the new online academic discussion system.

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Description of the new System

It is a computerized web-based system that is to provide a sustainable solution for academic discussions by allowing discussions to be conducted online. Thus, the new system enabled students especially at long distances also to participate in the discussions since the process was conducted online [8].

System Requirements
Requirements Analysis

The following are requirements for the different users of the system:

  i.   Users view their login and edit their profile
  ii. Users ask and answer questions.
  iii. The System administrator view and updates information.
  iv. The users sent messages to other users on the board.
  v.   Users react to both questions and answers for example downloading the document.

Functional Requirements

This part presents the functions that the online academic discussion System provided when installed;

  I.   The system allows the users to log in.
  II. The system allows the user to register on the online board.
  III. The system allows the system administrator to control and manage data in the system.
  IV. The system captures processes and stores users' information.
  V.   The system allows the users to update their information.

Non-Functional Requirements

These are concerned with the system properties and characteristics that the system must exhibit.
The system was speedy, accurate, secure and easy to use by all users [11].
The following are the functional requirement of the online academic discussion system.

- ❖ The system was easy to learn and use by its end users.
- ❖ The system was portable so that it may easily run on most operating systems.
- ❖ The system allows data modifications to authorized users by implementing a password security policy.
- ❖ The data output was accurate since the input data is validated.
- ❖ The system was efficient so as not to waste system resources.
- ❖ Data accessibility. Data were accessed by authorized users.
- ❖ Reliability because the application was a standalone system relying on a database stored on a remote server hence allowing for fast system start-up.

Hardware Requirements

This section described the hardware requirement which is at least necessary to run this system.

Processor

The minimum requirement of the processor is at least Pentium IV with 900 MHz processing speed. The speed of the processor determines the time taken for the execution of the instructions. Higher processing speed leads to faster execution of the instruction.

Ram

There should be a minimum of 256 MB of RAM available for the smooth functioning of the project. Higher memory leads to better results.

Hard disk

There should be a minimum of 40GB of hard disk for the smooth functioning of the project and so the recommended hard disk space is 40 GB.

Cache Memory

There must be about 512 KB of cache memory so that the accessing time can be better and compilation is easier [12].

Software Requirements

According to [13], In order for the system to perform as expected, these are its specifications for software. The system operated efficiently on all the Windows platforms and other modifications of the Windows operating system. The various Microsoft operating systems under which it operated include; windows XP, windows vista, windows dark edition, and Windows 7 provided the following applications are installed.

- MySQL workbench version 5.2 and WAMP server version 2.10. databases.
- Web browser for example Google Chrome version 2.11.

- Wamp server of 5.1 on which the system was accessed.

System Design

The system has a login page which is the first interface. This page enables the system user that is a student and this is done by logging into the system using a valid user ID and password. When Students login onto the system, he or she is privileged to directly access the forum page with a navigation menu where he or they can ask and answer questions. The entered data is stored in the database as questions and answers are entered by students. System design goes through two phases of development:

- Logical design.
- Physical Design.

Logical Design

Logical design (logical models) depict what a system is or what a system must do but not how the system was implemented. They are implementation independent that is, they depict the system as independent of any technical implementation. The logical design involves the system entities. A database contains one or more related tables. Each table holds all of the information about an object [14-16].

Systems Architecture

The system runs on the client-server architecture basis whereby its operation reflected the co-existence of the server machine and a client machine. This, therefore, means that the system was hosted on a single computer (server) from which other computers (clients) accessed and execute required operations accordingly.
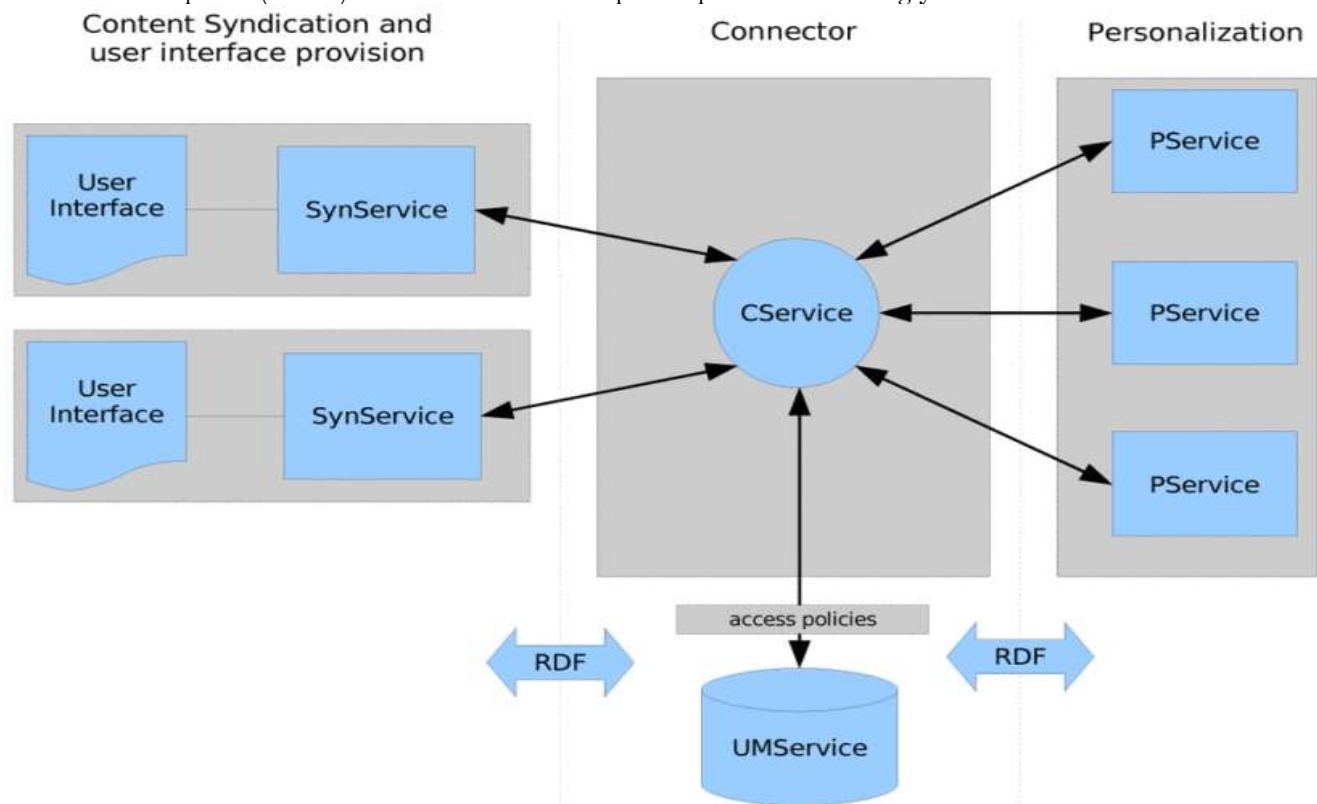

Figure 1: Diagrammatic illustration of system architecture

Relationships Between the Entities

A relationship type is a set of associations between one or more participating entity types. The most common degree for relationships is binary. Binary relationships are generally referred to as being one-to-one (1...1), one-to-many (1...*), or many-to-many (*..*).

Entity Relationship Diagram

Under the Entity Relationship Diagram, the researcher introduced the basic concepts of the Entity–Relationship model, namely entities, relationships, and attributes. Below is how basic ER concepts are represented pictorially in an ER diagram (http://stackoverflow.com/.)
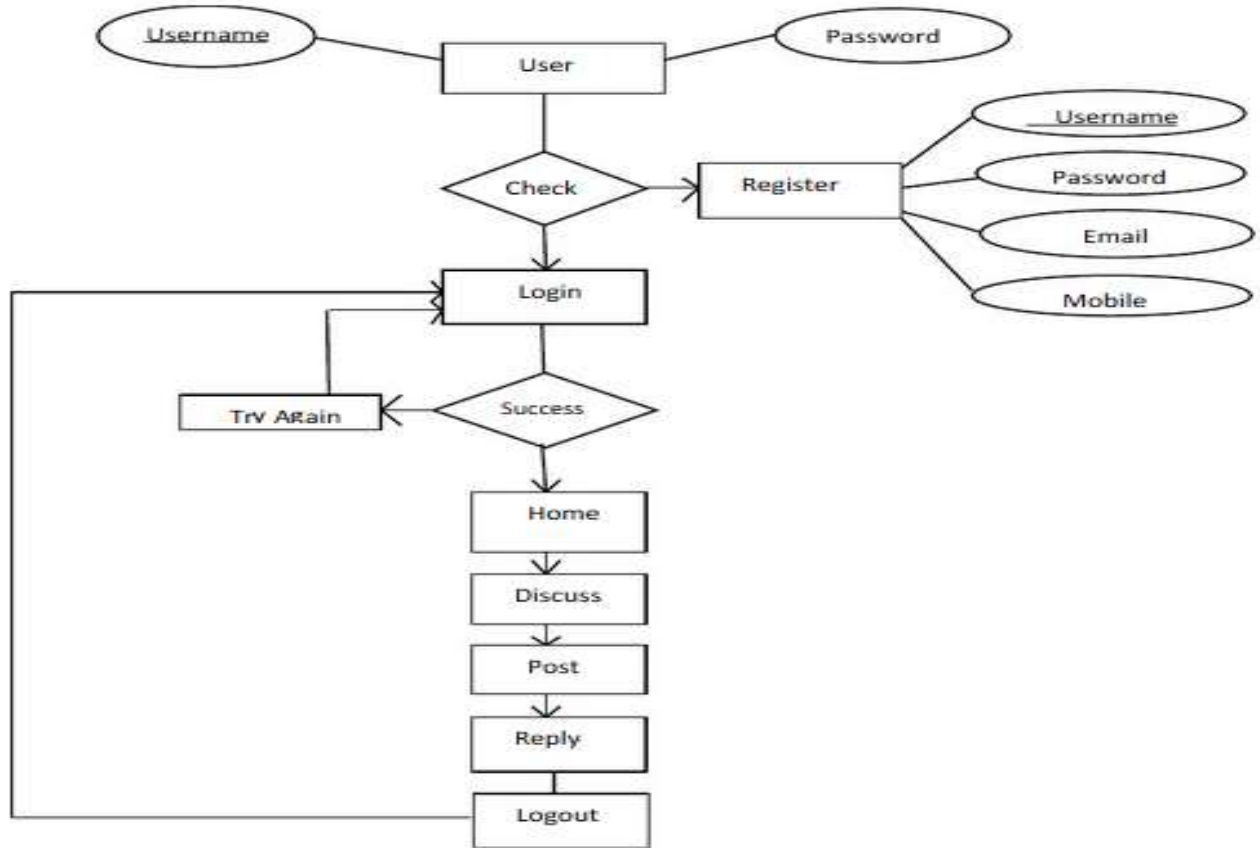
Figure 2: Showing entity relationship diagram

The Context Diagram

The overall design for the online academic discussion System of context diagram is illustrated below which shows system boundaries and interaction. It also shows the other groups of people that interact with the system and the main flows of data (http://www.asp.net/).
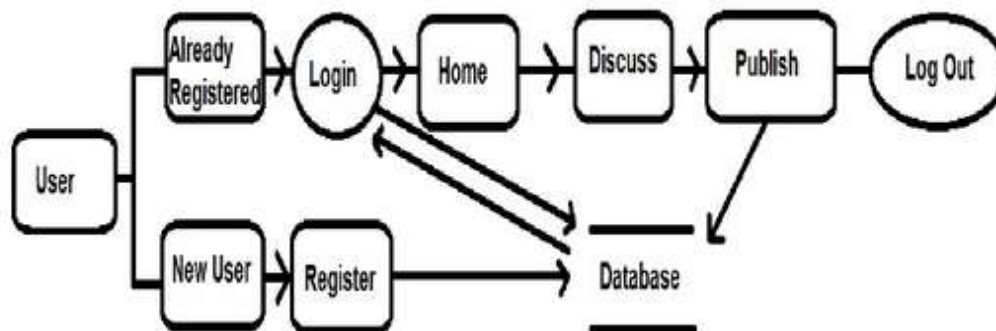
Figure 3: shows the context diagram

Data Dictionary

A data dictionary is a collection of descriptions of the data objects or items in a data model for the benefit of programmers and others who need to refer to them. The first step in analyzing a system of objects with which users interact is to identify each object and its relationship to other objects. This process is called data modelling and results in a picture of object relationships. After each data object or item is given a descriptive name, its relationship is described (or it becomes part of some structure that implicitly describes the relationship), the type of data (such as integer, varchar, date, etc) is described, possible predefined values are listed, and a brief textual description is provided. This collection can be organized for reference into a book called a data dictionary. The data dictionary for the First online academic discussion would be as follows:

User
Table 4: This table identifies the User in the database

Field name	Data type	Length	Constraints	Description
User_id	Int	100	Primary key	
Course	Varchar	100		
Regno	Varchar	100		
Category	Varchar	100		
User type	Varchar	100		
Username	Varchar	100		
Fullname	Varchar	50		
Password	Varchar	50		
User_acc_active	Varchar	1		
Dob	Varchar	10		
E_mail	Varchar	100		
Gender	Varchar	20		
Uimg	Varchar	255		
Issuer	Varchar	1		

Topic
The topic table identifies topics in the database
Table 5: Topic table design

Field name	Data type	Length	Constraints	Description
topic_id	int	11	Primary key	
topic_name	Varchar	250		
Topic_type		50		

The table above identifies the topic's tributes

Question
The subjects table shows the identification of the question.
Table 6: question

Field name	Data type	Length	Constraints	Description
Question id	Int	11		
Heading	Varchar	50		
Question detail	Varchar	2000		
DateTime	timestamp			
User_id	int	11		
Sutopic_id	int	11		
Views	int	11		

Answer
Table 7: answer

Field name	Data type	Length	Constraint	Description
answer_id	Int	11		
Replied	Int	11		
question_id	varchar	50		
Answer_detail	varchar	2000		
DateTime	timestamp			
User_id	int	11		
Like	int	20		

Chat
Table 8: chat table

Field name	Data type	Length	Constraint	Description
chatdetail_id	int	11		
Cdatetime	timestamp			
Message	Varchar	1000		
User_id	int	11		
Chat_id	int	11		

Chat Master
Table 9: chat master

Field name	Data Type	Length		Constraint	Description
Chat_id	int	11			
User_id_from	Varchar	255			
User_id_to	int	100			

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Subtopic
The subjects table shows the identification of the subtopic
Table 1: question

Field name	Data type	Length	Constraints	Description
Subtopic_id	Int	11		
Subtopic_name	Varchar	50		
Subtopic_description	Varchar	2000		
S_status	timestamp			
topic_id	int	11		

DISCUSSION
Physical Design

This is a process of producing a description of the implementation of the database on secondary storage. It, therefore, describes the base relations, file organizations and indexes used to achieve efficient access to the data and any associated integrity constraints and security measures.

Data Outputs
System Interfaces

These are the system interfaces developed and validated using powerful programming languages.

Login Page

This is the first page to be viewed when a System user visits the system.

Below is the displayed page before logging into the system

Figure 4: Showing the login interface

The window above shows a menu where a user can log in by entering the correct user id and password so as to be part of the discussion forum platform.

Question Interface Page

Figure 5: Showing the question interface

The page above displays the question menu where a user posts a question based on the topics displayed.

User Interface

It is on this page where a user registers so as to enable him or her to participate in online discussions.

Figure 6: Showing user interface page

The window above displays a registration form where a user registers so that he/she login into the system with the correct password and user id.

Topic Interface

It is on this page where a user views and posts questions.

Figure 7: Showing the topic interface

This page above displays different topics and their subtopics for a user to know which type of question to ask.

Answer Interface

This interface is viewed by all users for answers basing on different questions being asked.

Figure 8: Showing the answer interface

This window above displays the answer menu where the user posts an answer based on the kind of question being asked.

System Implementation

To implement the system, installation requirements like hardware and software were acquired. Planning analysis and project writing were done. The System was designed and users were trained on how to use the online academic discussion system. This was done in a period of two days because the user interfaces provided a short learning curve. System testing and review were also done to ensure that it was performing as it was designed to perform. It was reviewed to ensure that it met the objectives. The System was then implemented and a report was written.

User Training

The trainees to work with the new system were selected and trained. These are system users and Training involved teaching and guiding the users on how to operate and manage the system program and interfaces.

System Testing

System testing is recognized as an important part of quality assurance. Testing as shown below proceeds in parallel with system development, here a test plan is developed in parallel with system design. The test plan is then used in system testing. Testing proceeds through a number of steps.
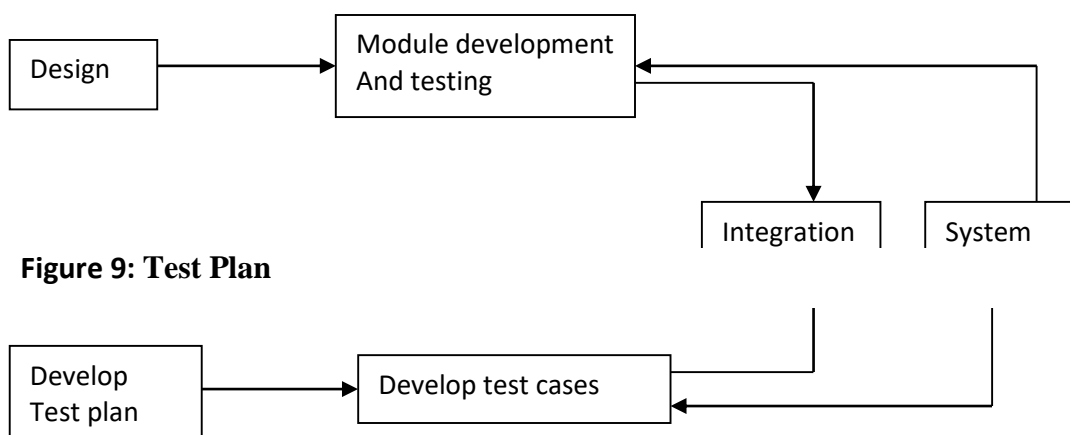

Figure 9: Test Plan

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The first individual program modules were tested by the developers. Once Individual modules were tested, the next step was to test whether they can be combined. This is known as integral testing; groups of modules are combined into test modules and tested together. The goal is to determine whether the interfaces between modules work. Then the entire system was tested. It is important to design test cases that test all. The conditions that can arise in system inputs, while at the same time ensuring that tests do not take too long.

System Conversion

There are four methods that may be utilized in implementing our system. They were Direct conversion, Parallel conversion, Phased conversion and Pilot conversion.

Parallel Conversion

Parallel conversion involves keeping the old system running alongside the new system for the first couple of weeks or months after the introduction of the new system. This means that any problems with the new system will not affect the continuation of the business. The problem with parallel implementation is that it costs more to run both systems and also data has to be entered twice which takes more time and is liable to errors. Ibanda University, parallel conversion was chosen as the users can take time to get familiar with the new system, before switching off the old one. System conversion which is also called system changeover, took place upon the approval of the new system testing. The parallel method of conversion from the current system to the new system was selected as the most appropriate for the current solution. The above figure shows how the system's changeover takes place. Both the new and old systems are used concurrently and are fully operational for a period of time, allowing a comparison of the two. This allows for the new system to be tested with a real-world set of data, which can be compared to the old system. Also, if the new system fails, the old one can continue with a minimum loss of data, as both systems are kept up-to-date.

CONCLUSION

According to the positive responses obtained from the surveys made, the researcher found out that online academic discussion is a great tool to help both the employees and maintain their communication beyond the classrooms by allowing them to provide and share opinions with others at any time and location. Since the current system is manual, the developed system to a larger extent full filled the requirements of the university in improving online academic discussions.

RECOMMENDATION

The researcher recommends online discussion learning as the best choice for universities in order to prepare their students for today's knowledge economy and make a full mobile application so that it can be accessed also on smartphones.

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