SciencePG
Science Publishing Group

Web Based Discussion Forum for Tertiary Institutions

Chidi Ukamaka Betrand*, Ukadike Chinonso Austin Moris, Okoye Goodness Oluebube

Department of Computer Science, School of Information and Communication Technology, Federal University of Technology Owerri, Owerri, Nigeria

Email address:
chidi.betrand@futo.edu.ng (C. U. Betrand)
*Corresponding author

Abstract: The world is fast becoming a global village with so rapid a growth in technology. A web discussion forum is a platform or a section on a website, that allows easy flow of communication among people, thereby enhancing the share of information, ideas and knowledge. The world is fast becoming a global village due to the effect of globalization and rapid growth in technology. With the challenges faced by many students in a bit to carry out their assignments, projects and passing of important information, the researcher deem it fit to create a social platform where students can easily and accessibly ask IT related questions bothering their minds with sole aim to get befitting answers. The result shows that users can successfully interact with their peers through the platform. This is in a bit to harmonize with the educational philosophy that makes communication a necessary tool and fundamental mechanism for effective learning. This study designed a web based discussion forum where students in tertiary institutions can come together to interact without the fear of prejudice. It was discovered that the interactions of the learners, their participation in the technology-mediated education was essential for the quality of learning experience acquired over the cost of the time.

Keywords: Discussion, Forum, Online, Thread, Web

1. Introduction

The use of technology in the day to day running of affairs of almost all human endeavours has been seen in the recent years to experience a great surge. Thus, technology in past few decades has transcend from manufacturing, economics down to education and even communication to mention but a few. Most importantly in communication, information can easily be disseminated across wide geographical land masses at an incredible speed and at real-time. This feat which has been greatly achieved with the help of technology has created and facilitated quick responses to necessities and as such, governments, organisations or even individuals can respond quickly and effectively to information without having to go through the crude processes of posts and stamp duties in order to get information or responses across.

Over the years, many attempts have been made in building systems that will aid communication across different levels, from the fax machine, to the Short Messaging System, emails, social media networks, feedback mechanisms found on different websites, chatbotsetc [1]. These systems have helped in their various levels and capabilities. However, in the search for solutions to some problems, a general solution might not always suffice. Modern problems require modern solutions, so does most specific problems require more specific or unique solutions. Most support systems are built on top of a mother system which most times, doesnot give rooms for quick responses as the numerous traffic on the system do affect the system's response time. Also, any other system as a report or support system built on top of a mother system will always have to share resources with other systems or units on the mother system and this will greatly affect its performance [2].

2. Concept of Online Discussion Forum

An online discussion forum (ODF) as a web-based application that tends to brings people with shared interests together. Its emergence as a common tool and an effective way of engaging students outside the classroom is laudable as

students have the privilege of massive information access thereby creating a deeper understanding of the subject matter being discussed [3]. They have been deployed to complement traditional learning techniques, harmonizes with the educational philosophy that makes communication a necessary tool and fundamental mechanism for effective learning among peers [4]. Peer learning and performance are primary predicted by the rate at which messages are viewed in the forum. It was discovered that the interaction of the learners with both human and inanimate objects, and their participation in technology-mediated education was essential for the quality of their learning experience, which can enrich the process of knowledge exchange among participants and has positive effects on the students' performance.; New ideas are learnt while the old ones are refined, there is also the keeping up with current events, new opportunities learnt, new business leads, as well as making new friends and contacts [5]. Proof exist that messages in online forums for problem solving are of more lasting impact and of deeper reflectios [6]. Online discussion forum as are very useful tool for teaching writing skills. A well-structured online discussion forum can provide students with extensive practice in writing. The online forum allows opportunities for the facilitation of curricular objectives via modern technology. Online discussion forums provide authenticity in writing and therefore serve as a meaningful supplement to the writing curriculum. The implementation of the online forum appears to provide reinforcement tasks to enable students to practice their writing. Students could share their ideas and opinions to produce better quality writing as compared to if the tasks were to be completed independently [7]. Most students feel comfortable writing online than in a face-to-face classroom or chat. Researchers have also found that students can take more time to read, craft, reflect on their responses, and find relevant information when composing messages in such an environment [8].

Online discussions however, build a motivating social practice of current generation students who make use of technology to contact friends and family throughout the day. In online forums, students develop their autonomy in language learning and each participant is given more authority to shape or lead the discussion in the direction they prefer. In a study among twenty-five Chinese and Kiwi learners, Gebric encountered that online forums provide opportunities specifically for particular groups of students. Chinese students found the virtual and text-based nature of the medium allowed them to enter discussions more easily and they felt more comfortable with their written responses compared to face-to-face discussions [9]. Several studies have found that online forums are beneficial in developing communication skills. Computer mediated communication (CMC) has a positive potential to increase interaction among students. Furthermore, the findings confirm the effectiveness of asynchronous online environment in supporting online learning community.[10] acknowledged a period of increased communication between online participants of his study after 10 days of interaction on an online forum and asserted that input from teachers or instructors during this period led to maximized learning opportunities. Online forums are a

good way of communicating, especially when the teacher or lecturer is unavailable. It is also a good way to communicate with everyone as it creates good communication between students and school. Students are more comfortable and less aggressive when participating in online forums. Online forums also offered more equal opportunities for group members to voice their opinions; they demonstrate very high levels of interaction among group members. Online forums are regarded as a social interaction that reduces students' reliance on face-to-face discussions.

2.1. Structure of Online Discussion Forum

A forum usually consists of a tree-like directory. The top end is the categories, that represent topic of discussions that are relevant. Under the categories are sub-forums which further have more sub-forums [11]. The topics, commonly known as threads come under the lowest level of sub-forums and these are the places under which members can start their discussions or posts. Logically forums are organized into a finite set of generic topics (usually with one main topic) driven and updated by a group known as members and governed by a group known as moderators. It can also have a graph structure. Therefore, a forum is made of the user groups which are the different users that have access to the forum, the post which are the messages submitted to the forums by the different users, and the threads which are topics for which a user can submit a post.

2.1.1. User Groups

Forums that are designed with western style allow visitors and members to be organized and logged in into user groups. Privileges and rights are given based on these groups. Based on criteria set by the administrator, a user of the forum can automatically be promoted to a higher user group, giving him more privileges in the forum. The administrators manage the technical details required for running the site. As such, they may promote (and demote) members to moderators, manage the rules, create sections and sub-sections, as well as perform any database operations (database backup, etc.). Administrators often also act as moderators [11] Administrators may also make forum-wide announcements, or change the appearance of a forum. The moderators are the users (or employees) of the forum who are granted access to the posts and threads of all members to moderate discussion and also keep the forum clean (neutralizing spam and spambots etc.). They also help to control the content of the discussion of members of the forum. Because they have access to all posts and threads in their area of responsibility, it is common for the site owner to promote his friend to a moderator for such a task. Moderators also respond to users' questions about the forum, as well as respond to specific complaints. They also can do anything to lend a helping hand to a user in need [16]. Moderators themselves may have ranks depending on the level of privileges assigned to them. Some may be given more privileges over only a particular topic or section, while others (called global or super) may be allowed access anywhere. Common privileges that moderators can

have include: deleting, merging, moving, and splitting of posts and threads, locking, renaming, sticking of threads, banning, suspending, unsuspending, unbanning, warning the members, or adding, editing, removing the polls of threads.

Essentially, the moderator manages the day-to-day affairs of a forum or board as it applies to the stream of user contributions and interactions. The relative effectiveness of this user management directly impacts the quality of a forum in general, its appeal, and its usefulness as a community of interrelated users. Category of moderators also exist e.g. Global Moderators and just Moderators. Global moderators have the rights to moderate the complete forum while moderators can be assigned only to the sub-forum.

A viewer who does not have some privileges on the forum is said to be viewed in a closed group. He does not have the right to submit messages there, but a moderator will likely have access to more than just posting messages in the forum.

A user of the forum who has not registered on the site is commonly known as a guest or visitor. Guests are typically granted access to all functions that do not require database alterations or breach privacy. A guest can usually view the contents of the forum or use such features as reading marking, but occasionally an administrator will disallow visitors to read their forum as an incentive to become a registered member.

A lurker is someone that regularly visits the forum, and the habit is referred to as lurking.

Registered members often will refer to themselves as lurking in a particular location, which is to say they have no intention of participating in that section but enjoy reading the contributions to it.

2.1.2. Post

A post is a message submitted by a user which is enclosed into a block that contains the date and time that it was submitted. Members of the forum are usually allowed to edit or delete their posts. Posts are contained in threads, where they appear as boxes one after another. The first post starts the thread; this may be called the TS (thread starter) or OP (original post). Posts that follow in the thread are meant to continue the discussion about that post, or respond to other replies; it is not uncommon for discussions to be derailed. The internal limit of a Post is usually measured in characters. Often one is required to have a message of a minimum length of 10 characters. There is always an upper limit but it is rarely reached – most boards have it at 10,000, 20,000, 30,000, or 50,000 characters. Most forums keep track of how many posts a certain user has made. This is known as the user's post count. Users with higher post counts are often considered more reputable than users with lower post counts. Some forums have disabled post counts in the hopes that doing so will reduce the emphasis on quantity over quality of information.

2.1.3. Threads

A thread is also known as a topic. It is a collection of different posts, usually displayed from oldest to the most recent, though this is subject to review: options for the most recent to the oldest and for a threaded view (a tree-like view applying logical reply structure before chronological order)

can be available. A thread is defined by a title, an additional description that may summarize the intended discussion, and an opening or original post (common abbreviation OP, which can also mean original poster) which opens whatever dialogue or makes whatever announcement the poster wished. A thread can contain any number of posts, including multiple posts from a single poster, even if they are one after the other. A thread is contained in a forum and may have an associated date which is taken as the date of the last post (options to order threads by other criteria are generally available). When a member posts in a thread it will go to the top since it is the latest updated thread. This is for threads that are configured to display from most recent to oldest. Similarly, other threads will go in front of it when they receive posts. Threads that are important but rarely receive posts are sticked (pinned). A sticky thread will always appear in front of normal threads, often in its section.

A threaded discussion group is simply any group of individuals who use a forum for threaded, or asynchronous, discussion purposes. The group may or may not be the only users of the forum. The popularity of a thread in a forum is measured in the number of replies (total posts minus one, the opening post, in most default forum settings) counts. Some forums also keep track of the number of page views. Threads that meet up to a particular number of posts or views may receive a designation such as hot thread and be displayed with a different icon compared to other threads. This icon may stand out more to emphasize the thread.

A dead thread is used to refer to a thread in which the users have lost interest.

2.2. Review of Related Works

A 14-week mathematicscourse was supported by the Blackboard Learning System (BBLS), on which the course materials were uploaded [12]. The discussion forums available on the BBLS were used for problem-solving sessions. A treatment group of 45 students participated in the Discussion Forum sessions, from a large class of 100 students. The students were compared against a control group of 45 students of the same course, who have not participated in the problem-solving sessions over the forum. Ill-structured problems were posted by the instructor on the discussion forum of the BBLS, twice during the 14-week course. Data was gathered from the pre-test and final assessment scores of the students from the treatment and control groups. An independent samples t-test was done to check whether the pre-test scores differed significantly between the treatment and the control groups. The pre-test results showed that the t-test was significant. Students in the treatment group performed at a higher mathematical ability than the students in the control group. A system that improved peer interaction in a discussion forum. to provide the most effective learning experience by way of quality student interaction and engagement was developed [13]. The statistics collected are aimed at testing strategies and systems employed to improve peer discussions in online discussion forums aimed at encouraging participation and joint learning. Three research questions were developed to checkmate how effective online engagement was on the students. The online discussion

forum allowed interaction between the students whose only system of class attendance was online and their physical counterparts getting a timely response to points they need clarity on. 85 students were in the GDA class but only about 30 participated in the forum.

Seethamraju demonstrated the ability of students to work collaboratively using online discussion in developing an optimal solution using synergies generated through collective wisdom and peer-to-peer learning [14]. It requires students to participate in an online discussion forum weekly in a semester that spans 13 weeks. In general, students perceived improvement in learning because of the online environment and appreciated the opportunities it has provided for a deeper understanding of content-based issues, appreciation of multiple views, and reflection of their learning and perceptions. Hammond did a review and calculated the cumulative compilation of papers that run case studies on how online discussion has affected the learning process in higher education [15]. Through the papers it was concluded that online discussion is a bonus mode of learning by allowing participants in the forum acquire extra knowledge on computer communication tools and learning to work in groups. Seven international journals were selected as test materials on the development process of asynchronous online discussion. The journals were categorized by discipline area, country of case study and software used in this study. The different papers were then paired by common factors which was thought would affect any online discussion forum.

Blackmon investigated the effects of blended learning on the middle school students' academic achievement level and product evaluation scores [16]. Blended learning provides more effective learning outcome gains through enriching today's developing Web Technologies with learning environments. This study was carried out with a total of 53 students enrolled in the experimental group and control group in the 6th grade classrooms during the 2014/2015 school year in a middle school in southwest part of Turkey. The intervention lasted 7 weeks. During the seven weeks, the unit of "problem solving, computer programming and development of Software product", covered in Educational technologies and Software course, is taught through blended learning environment. The experimental group was taught using blended learning environment which supported with enriched web technologies (such as video-conference, Learning Management System, Discussion blogs, etc.) [17]. Whereas the experimental group was given access to all these enriched contents that are presented to the control group only during the classroom environment through present teaching methods.

3. Web Based Forum

Use Case Diagram of the System

A use case diagram is a representation of a user's interaction with the system. shows the relationship between the user and the different use cases in which the user is involved. The proposed system is made up of two interfaces, the Admin interface and the User interface. The Admin

interface is a section where the whole system is being controlled and monitored, in this section, the admin can create new rooms, department, faculty etc. the admin can also view all users and even suspend a user's account if the account is reported of foul post.

The user interface is a section where the users can create a new post, view all posts and interact via private messaging with their peers.
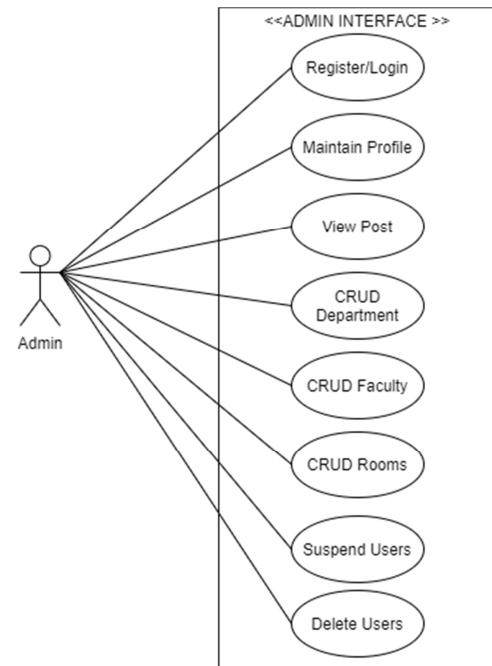

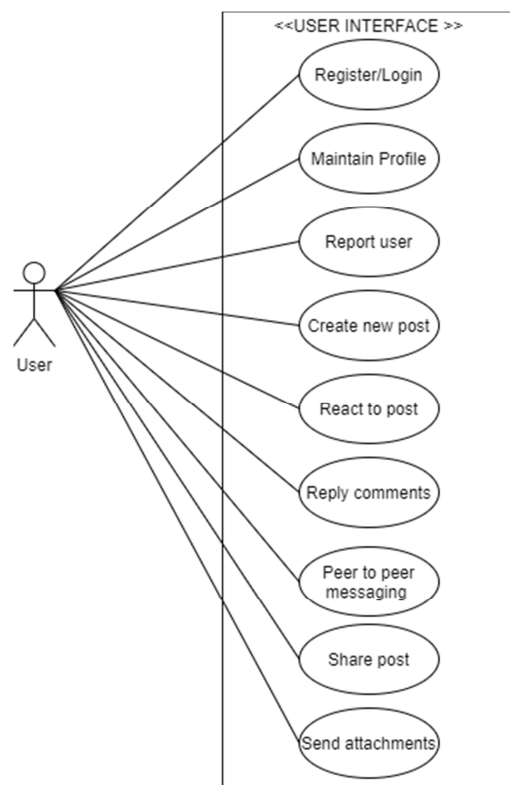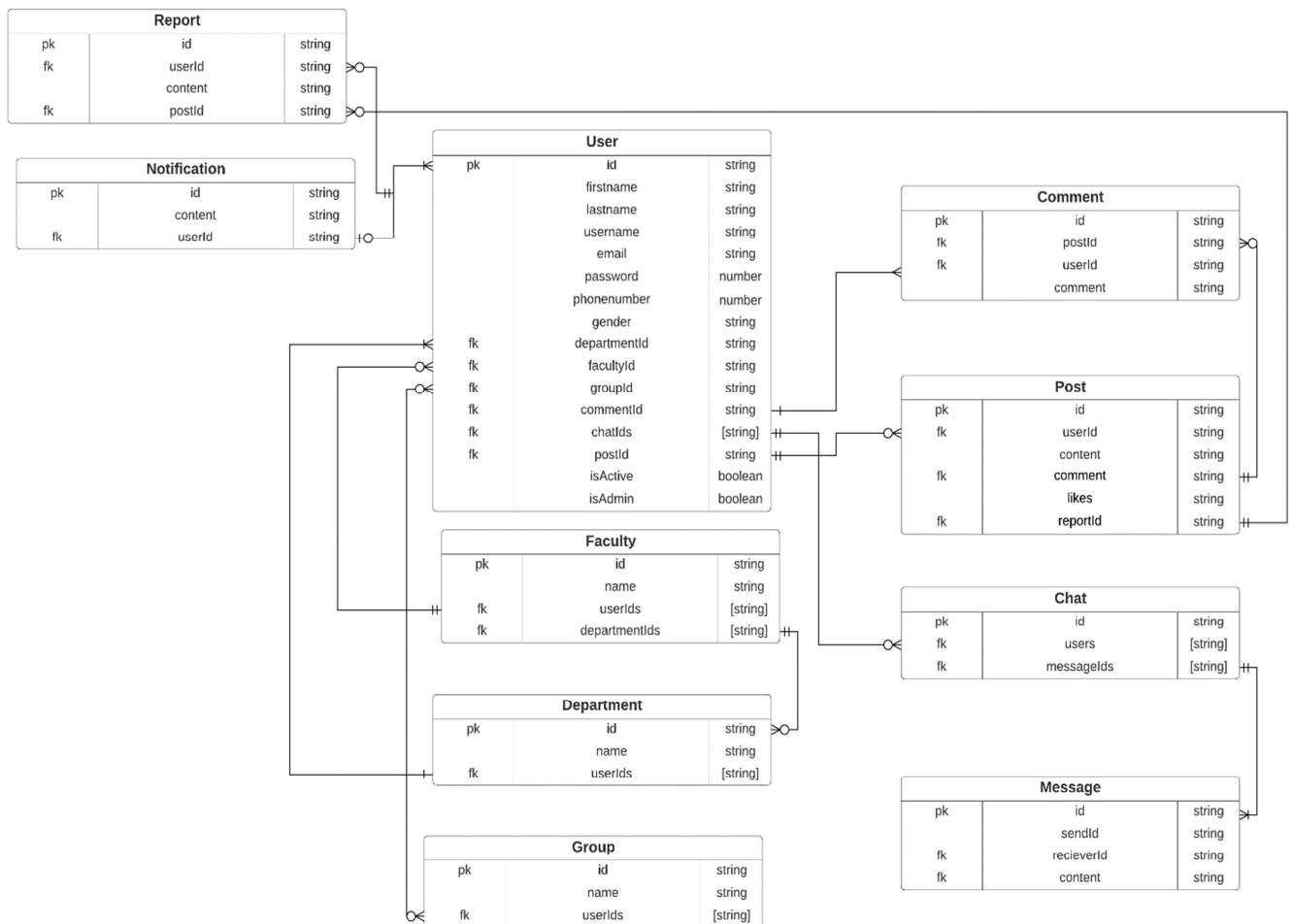*Figure 1.* Use Case Diagram (Admin).

Figure 2. Use Case Diagram (User).

Table 1. Use Case Explanation.

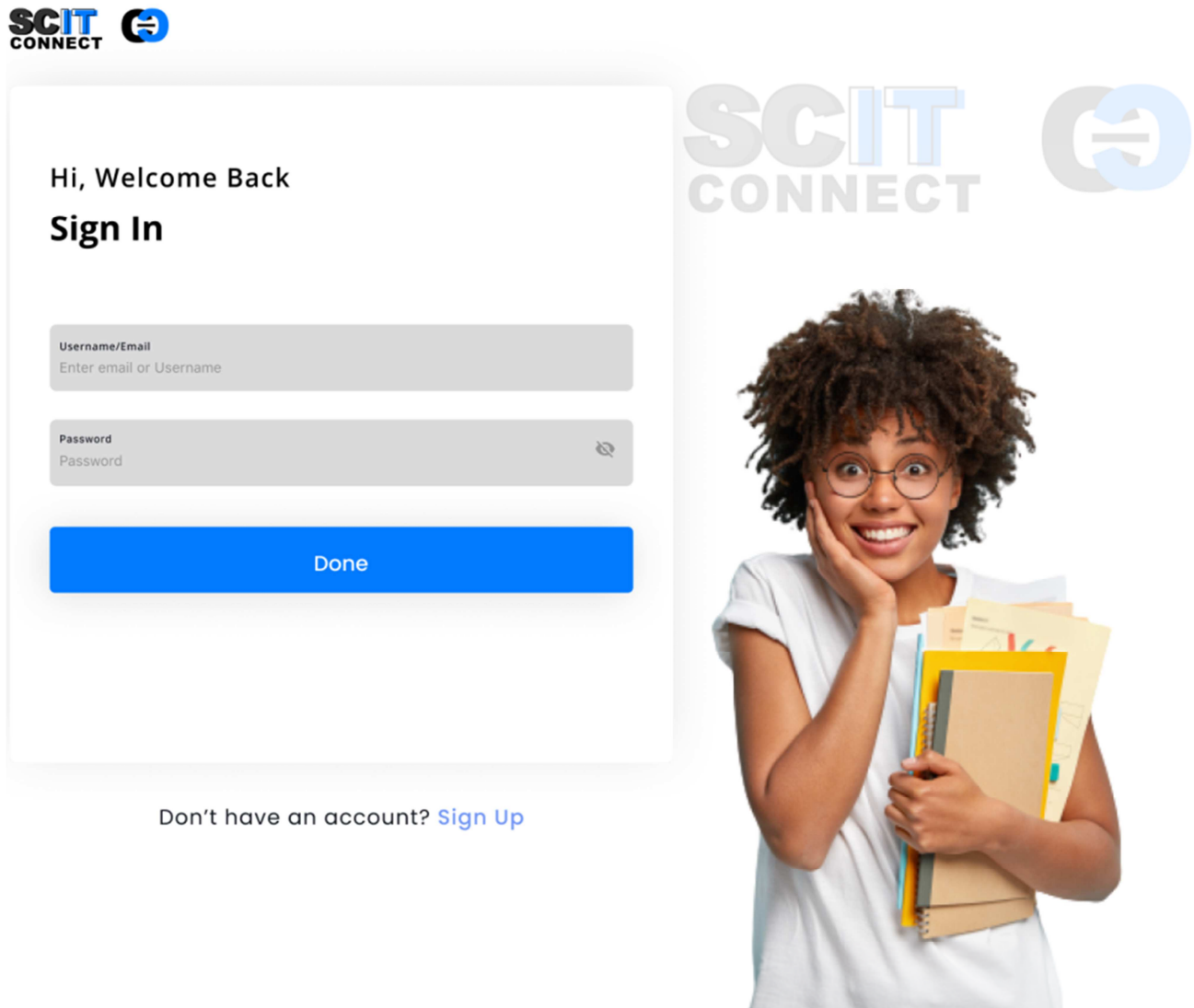| Character	Use case	Description
Admin	Register/ Login	Admin can register and login
	Maintain profile	Admin can create and update profile
	CRUD department	Admin can Create, View, Update and delete department.
	CRUD faculty	Admin can Create, View, Update and delete faculty.
	CRUD Rooms	Admin can Create, View, Update and delete Rooms.
	Delete users	Admin can delete users.
	Suspend users	Admin can suspend a user if they have been reported.
	View posts	Admin can view all posts.
User	Register/ Login	User can register and login
	Maintain profile	Users can create and update profile
	Report user	Users can report their peers if there is a foul or abusive post
	Create new post	Users can create a new post.
	React to post	Users can react to a post by commenting or liking the post.
	Reply comments	Users can reply to a comment.
	Peer to peer messaging	Users can send private messages to each other.
	Share post	Users can share post to other media platforms
	Send attachments	Users can send images, doc and audio via peer to peer messaging.

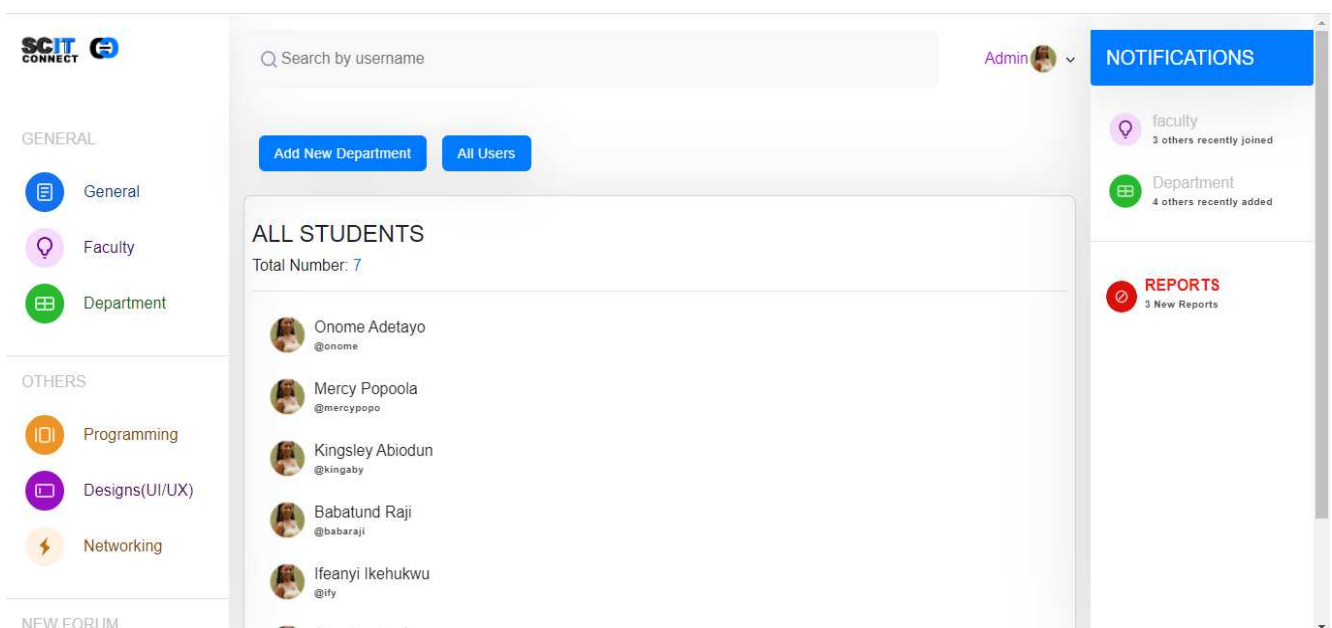*Figure 3. Entity Relationship Model for the System.*

Figure 4. *Login page.*
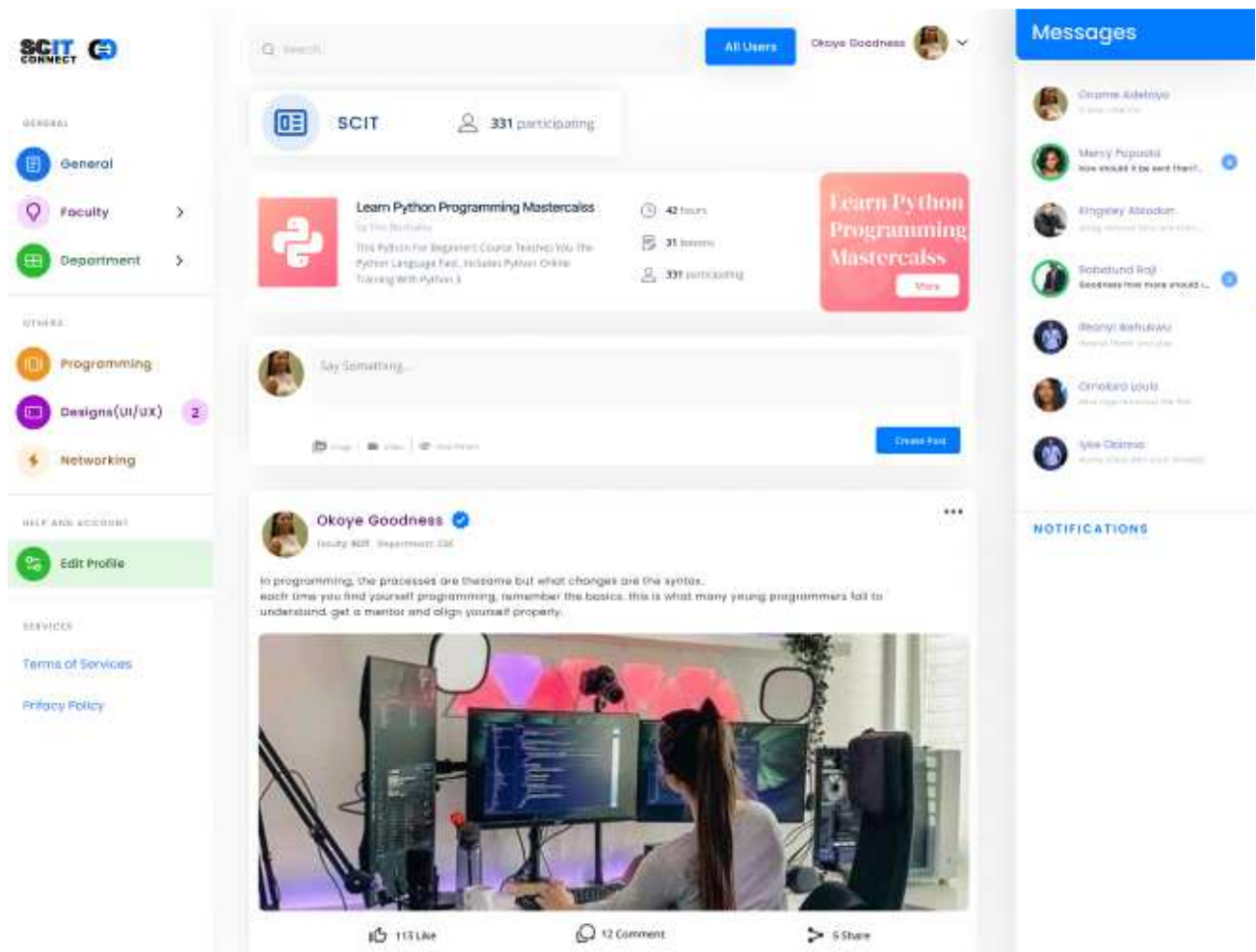

Figure 5. *Admin dashboard.*

Figure 6. *User Home Page.*

4. Conclusion

The application was successfully developed, tested, and found to be working as expected. It enables users to create an account, login, create post, react to post, comment on post and have a private discussion with one another via the peer to peer messaging without the fear of prejudice. It is easy to use due to the friendly user interface that was provided for the software. In this system, communication gap within the students has been filled to a large extent, making the users to communicate freely with one another especially the introverts, this will help improve academic excellence amongst users.

References

[1] Cheung, W., Hew, K., & Ng, C. (2008). Toward an understanding of why students contribute in asynchronous online discussions. *Journal of Educational Computing Research, 38* (1), *29-50.*

[2] Zuheir, K; Hamid, N; and Kyungbin, K. (2017). Types of Interaction in Online Discussion Forums: A Case Study. Journal of Educational Issues, 3 (1): 155-159.

[3] Hamdan, A. (2014b). The reciprocal and correlative relationship between learning culture and online education: A case from Saudi Arabia. *International Review of Research in Open & Distance Learning, 15* (1), *309- 336.*

[4] Chiu, T. K., & Hew, T. K. (2018). Factors influencing peer learning and performance in MOOC asynchronous online discussion forum. *Australasian Journal of Educational Technology*, *34* (4).

[5] Greenlaw, S. &DeLoach, S. (2003). Teaching critical thinking with electronic discussion. *Journal of Economic Education, 34* (1), *36-52.*

[6] Akmal, D. (2017). Impact of Web Based Learning on EFL: Using On-line Discussion Forum (ODF) to Enhance Students' Writing Skill. *Universal Journal of Educational Research*, *5* (8).

[7] Duran, D., Schütze, H., Möbius, B. *et al.* (2010) A Computational Model of Unsupervised Speech Segmentation for Correspondence Learning. *Res on Lang and Comput* 8, 133–168.

[8] O'Neill P., Duplock, A., & Willis, S. 2006. Using clinical experience in discussion with problem-based learning groups. Advances in Health Education, 11, 349–363.

[9] Gerbric P. 2005. Chinese learners and computer mediated communication: Balancing culture, technology, and pedagogy. Maintaining the Momentum? (Vol. 1, pp. 241–251).

[10] Hew, K. F. & Cheung, W. S. (2003b). Evaluating the participation and quality of thinking of preservice teachers in an asynchronous online discussion environment: *Part II. International Journal of Instructional Media*, 30 (4).

[11] Alabo, H. B. & Emmah, V. T., (2014) Online discussion Forum: a Tool for effective student- teacher Instruction. Innternational Journal of Applied Applied Science Research and Review 1 (3), 111-116.

[12] Jacob, S. M., & Sam, H. K. (2008, December). Effect of online discussion forums to improve mathematics problem solving and critical thinking-A comparative study. In *2008 International Conference on Innovations in Information Technology* (pp. 366-370). IEEE.

[13] Xia, J., Fielder, J., &Siragusa, L. (2013). Achieving better peer interaction in online discussion forums: A reflective practitioner case study. *Issues in Educational Research*, *23* (1), 97-113.

[14] Seethamraju, R. (2014). Effectiveness of using online discussion forum for case study analysis. *Education Research International*, *2014*.

[15] Hammond, M. (2005). A review of recent papers on online discussion in teaching and learning in higher education. *Journal of asynchronous learning networks*, *9* (3), 9-23.

[16] Blackmon, S. J. (2012). Outcomes of chat and discussion board use in online learning: A research synthesis. *Journal of Educators Online*, *9* (2), n2.

[17] Ceylan, V. K., &ElitokKesici, A. (2017). Effect of blended learning to academic achievement. *Journal of Human Sciences*, *14* (1), 308–320.