INTERNATIONAL CONFERENCE ON ENGINEERING AND PRODUCT DESIGN EDUCATION
4 & 5 SEPTEMBER 2014, UNIVERSITY OF TWENTE, THE NETHERLANDS

AN INTEGRATED SOCIAL INTERACTIVE TOOL TO IMPROVE KNOWLEDGE SHARING AMONG STUDENTS

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ABSTRACT
Knowledge sharing is important to students in their learning process. However, students come from different background and cultures, speak different languages and work or study in different ways. They need to use many websites or tools to achieve the aim of their knowledge sharing. All these are problematic and time-consuming to students. Therefore, an integrated tool would be preferable to overcome these issues and thus, promote knowledge sharing between them. This paper presents the literature review, survey and interview on which the design of an integrated knowledge sharing tool, Mybook, was based as well as the user testing of Mybook with students.

Keywords: Social interactive tool, knowledge sharing

1 INTRODUCTION

Knowledge sharing is undeniably important. While students learn, they share and exchange academic information with one another. In fact, what being shared is not only academic information, but also practical information such as venue, time table and news about the courses. Thus, knowledge is shared in the form as information flow between students and teachers and among students themselves [1]. Paulin and Suneson [2] defined knowledge sharing as the exchange of knowledge between and among individuals. They stated that the focus of knowledge sharing is on human capital and the interaction of individuals in knowledge sharing. Since knowledge sharing involves interaction of individuals, social interactive websites such as Facebook can be a good platform for this purpose. Social sites like Facebook is more universal applicable than other websites as it serves people from different countries.

Students and teachers use different communication systems and different ways of working as compared to one another. One might use email to communicate while another prefers to use instant messaging. One teacher might post information in Learning Management Systems (LMS) such as Fronter, Moodle, and Blackboard; while others might like to inform via email. These tools can be categorized into two levels: tools for specific purposes such as email, instant messaging and integrated tools such as LMS and forum sites. Therefore, students find it burdensome when there are many different systems for their daily educational purposes. Besides, due to the different background and cognitive ability, language and graphical layout become essential factors in the usability of applications or websites. All these websites or systems serving different purposes with different layout make it difficult and time-consuming to students. Particularly it is difficult for international students to use systems or websites that are only in local languages. For example, announcements published in Fronter, a widely used LMS website in Norway, become troublesome to international students as some of the pages are written in Norwegian and are not automatically translated to English even though the language set by the students is already English.

Nevertheless, students are also required to use different websites to achieve their educational related tasks. For example, getting course resources in Fronter, checking venue at WebUntis, getting exam result in StudentWeb, sharing documents in DropBox or Google Document, and discussing group project on Facebook. This add extra burden to the students as they need to remember more passwords, user names and so on. Thus, this research aims to make knowledge sharing easier by proposing an integrated social interactive tool, which combines several websites or functions that students use in order to save students' efforts and time.

This paper is organized as follows. Section 2 introduces the literature review about related works to knowledge sharing. Section 3 and 4 present findings of the survey conducted with 91 students in Norway

and interviews with six international students to identify the requirements for the proposed prototype. Section 5 introduces the prototype designed based on the findings from both surveys and interviews. Section 6 presents the results of user testing. Finally, Section 7 concludes the paper with discussions of the limitations and future work.

2 LITERATURE REVIEW

According to McInerney [3], knowledge can be acquired through reading and listening to others. If this is so, then one important conduit for knowledge sharing among individuals in online environments is online conversation [4]. Nowadays, conversation occurs online in the form of instant messaging, e-mail and online discussion forums. Sharratt and Usoro [4] suggested that within the context of online environments, the direct mechanism for engaging another member who may possess the required knowledge is to post an open question or a request for help to the online network or community. Therefore, it is actually more efficient and effective to have a common platform where students can ask and answer, and most importantly the common platform has to be actively used and not felt as troublesome by the students.

In addition, Wasko, Faraj and Teigland [5] found that high participation (including sharing knowledge) in an electronic network was due to the easiness provided by technology. It only demotivates the students to participate actively if they are required to make extra efforts (i.e., going to different websites to retrieve related information). Students would prefer one technology integrated of all that they need to use in their educational tasks.

Resource sharing includes sharing documents, links, videos or images. Educational recourse sharing provides a platform for teachers and students to share the knowledge and at the same time to compile them. The resources are in public sharing networks, databases and can also be derived from the individual on the network share. The databases of educational recourses sharing are divided into many different discipline databases such as telecommunication engineering recourse database and higher mathematics recourse database. It is easier for users to search knowledge. Recourses sharing makes dissemination of knowledge more efficient and effective and that is definitely required in an integrated social interactive tool for educational purpose [6].

Search engine enhances learning flexibility and adaptation, promote knowledge creation, share, capture and shorten the knowledge acquisition time [7]. Apart from this, Kim and Tse [8] points out when the search engine should introduce a knowledge-sharing service rather than to increase its search quality for more profits. In accordance to that, an integrated social interactive tool with search engine can provide better knowledge sharing platform.

Document storage is no longer a problem nowadays due to its commonality. In healthcare, research has been conducted on the foundation for collection of health data, which was related to maintaining the privacy and security of sensitive information [9]. However, very few studies have focused on how to make document storage better in education context. Hence, it is important to find out if students would like to have document storage integrated into a social interactive tool when it comes to the sensitivity of information.

3 SURVEY

A survey was conducted to understand how students share knowledge and use the required or available technology to perform their educational tasks. Understanding the situation would provide a foundation for improving the current solutions. There were a total of 10 questions in the survey and 91 respondents from Europe (76.92%), Asia (17.58%), Africa (3.30%), Americas (1.10%) and Oceania (1.10%). The results showed that 90 out of 91 students do use social interactive tools or websites such as Facebook and 72 out of 90 of them actually use them every day. 81 also use them for educational purpose, such as discussion, learning, group assignment, etc.

Other questions included the usage of several educational related websites. For instance Fronter, Dropbox for online storage, Google Document and library search engine. More than 50% of the respondents use them often in their educational activities. Lastly, they were asked if an integrated social interactive tool which combines their daily used educational websites or tools would help their lives as students. The results were rather positive, with 60 out of 91 saying yes. All in all, this survey supported the proposed idea of an integrated social interactive tool for educational purpose.

4 INTERVIEWS

Six international students from Oslo who use Fronter regularly were interviewed to gain deeper information regarding to the requirements of the social interactive tool [10]. First of all, they were positive about integrating several educational websites that they use so that they do not have to visit many different websites and remember their user names and passwords. For their educational activities, they mentioned that they do use Facebook for communications and discussion, while Dropbox is often used for document sharing and storage. Features that pointed out by them were sharing documents, chatting and discussion. Both Facebook and Dropbox were essential applications for their knowledge sharing.

Fronter was where they visit often to get course materials and announcement from the lecturers and school. Besides, they also needed to access WebUntis to check on venue of the classes sometimes. Thus, it is more apparent that an integrated tool will ease their lives.

The participants in the interview also suggested integrating student email and discussion or chatting tool to ease their communications with others. *"It was troublesome for me to check my student email because I do not know when there is incoming unread email in inbox. I have to check in Fronter from time to time"*, said one of the interviewees. Hence, it will be more convenient for the students to have them integrated rather than accessing different websites to check on related matters.

Furthermore, they also voiced out their difficulties with searching room, news, announcement, materials and so on in Fronter. There is no search function in Fronter as of today. They felt frustrated because they had to use try and error method to find what they wanted. Most of them agreed that Fronter website that they were using daily had severe design flaws in layout and navigation flow. One of them said *"Fronter needs too much clicks. I do not know where to find the information sometimes."* Example given (Figure 1) was when they needed to access the 'room' (subject/course) in Fronter. After opening one room and wanting to open another room, user is always required to click 'Rooms' and 'Display all rooms' again even though this has been done previously while opening the first room. The interviewees commented that this step was not necessary as it is repetitive. This process was commented as not user friendly either because novice users might not know where to click at first. Most of them had this problem when they started using Fronter.

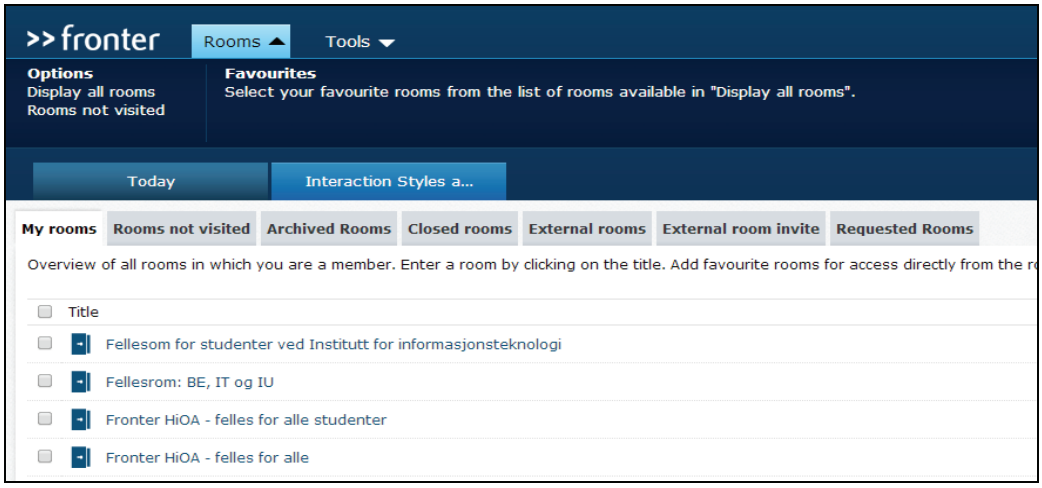

Figure 1. Fronter 'room' page

Furthermore, setting the default language as English in Fronter does not help translating the announcement made in Norwegian (Figure 2). For international students, this is a frustrating issue because they have to find their own ways to translate the announcement.

Overall, the issues identified in the interview have been addressed in the prototype which is presented in the next section.

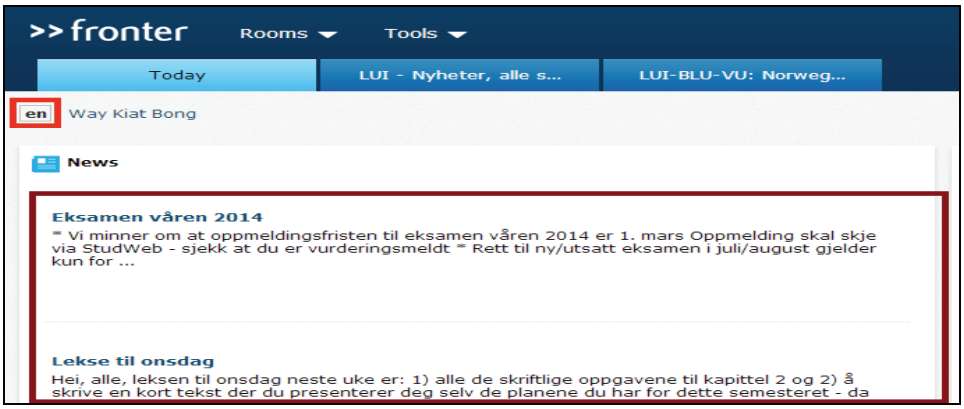

Figure 2. Fronter 'language' problem

5 PROTOTYPE

Based on the survey, interview and literature review, the prototype is designed to integrate the following components, which are (1) discussion or announcement, (2) document storage, (3) document sharing and (4) search engine. A user-centered design approach has been adopted to ensure issues faced by users are resolved. A low fidelity prototype has been developed based on social site Facebook and named as Mybook, which is an integrated social site for students' social and studies activities (Figure 3).

The integrated site aimed to resolve students' problem of visiting multiple websites and having to remember multiple user names and passwords. The reason for using Facebook as a referral prototype was that it is widely used in most of the countries and therefore, students from different countries will probably find the layout most familiar and user-friendly. The prototype was designed to integrate four main features, which are discussion or announcement, document storage, document sharing and search engine; and at the same time, suggestions from the interviewees have been taken into consideration.

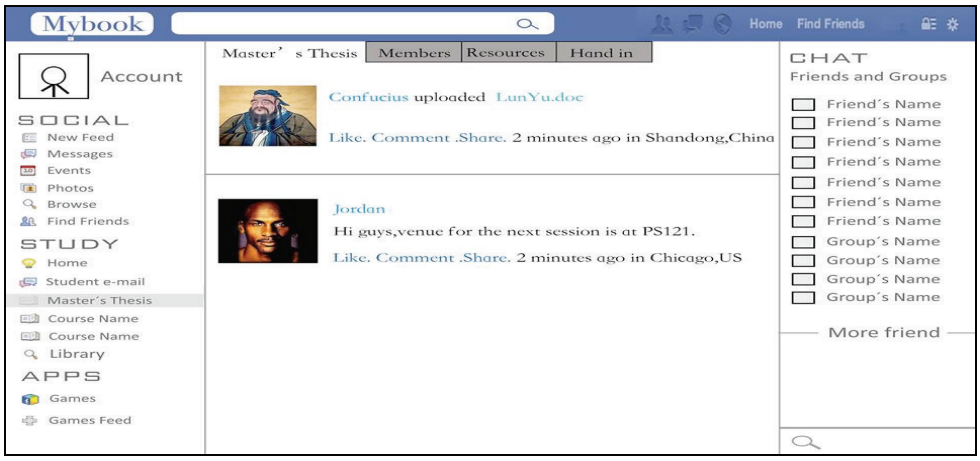

Figure 3. Prototype "Mybook"

The left hand side of Mybook has two main components namely 'Social' and 'Study'. Under 'Study', students can find the homepage where public announcements from the school are posted. Next is the student email. There are also courses that student are enrolled in. After clicking at course name, there will be tabs where they can find announcement or discussion area, members, resources for document storage and sharing, and hand-in section. Figure 3 shows the announcement about someone uploaded a document and a change of venue at tab course "Master's thesis".

By using the tab "members", the students are expected to find their classmates and lecturer easily. Tab "resources" is where students can access to materials for the course. Last tab "Hand-in" is where students submit their assignments, projects, etc.

The design of Mybook was to minimize the number of clicks that students have to perform to reach each function in order to increase task efficiency and effectiveness. Using Fronter to access different "course" room will require three but using Mybook it only require one click. In addition, the layout is also much

easier to be navigated because the courses are all listed in one page, which does not require students to navigate from one page to another in order to search for the courses.
For search engine function, there is 'Library' which links directly to school library databases. Besides, there is a search box in the top bar where students can search for related information, just the same as in Facebook. Lastly, the prototype also keeps the original function as Facebook at the right, which is chatting tool with friends or groups, as suggested by interview participants. This is to ease individual or group discussion.

6 USER TESTING

User testing was conducted with five international students who are currently studying in Oslo [10]. The goal of the testing was to see if the students found it easier and more satisfied using Mybook, an integrated social interactive tool for their studies. Each testing took less than 30 minutes and both qualitative and quantitative data were collected. A Likert scale questionnaire was given to the participants at the end of the user testing for quantitative data while observations were done for qualitative data. Participants were free to provide feedbacks on the prototype after the testing.
The testing tasks were to identify where to (1) access the page for a course, (2) submit assignment, (3) find classmates from the course, (4) send email, (5) search resources for library, (6) chat with other students, (7) find other shared documents, and (8) get updates from social news feed. All five participants managed to complete most tasks in less than five seconds. They scored mostly 'agree' and 'strongly agree' when they were asked about the easiness to perform testing tasks. This clearly indicated that the layout of Mybook is easy to use. The students were also familiar with the layout of Mybook due to their familiarity of Facebook. One of them said, *"This looks just like Facebook! So it is easy for me to use"*.
All five participants also found it much simpler using Mybook. By using Mybook they did not have to click as much as using Fronter and the main contents were all shown in first page rather than hidden as drop down pane and required click to have them shown up. Using Fronter to access a course room will require three clicks each time and this process needed to be repeated for every single course room. In Mybook, all the course rooms are displayed at the left as a list. Therefore only one click is required for accessing any course room. This list, however, has its drawback when there are many courses enrolled by a student. The average amount of 4-6 courses was taken into account while designing the display as a list.
All five participants felt more motivated to check educational information since it is much convenient to have all educational information integrated into one website. At the same time, they also felt much easier with remembering fewer user names, passwords and even websites. Lastly, they agreed that integrated website could promote knowledge sharing.
All in all, all of the participants were satisfied with using Mybook. The only negative feedback was one of them disagreed with that "it is easy to find document sharing/storage made in the website" due to confusion of the term "resources" and "document sharing". Some suggestions were given, including file sharing directly at chat function, separating or grouping friends into different types such as social friends, classmates, and changing the name "resources" to "document sharing" and "hand in" to "upload". One participant mentioned that combining study with social activities might cause distraction. This could be further studied with more students in the future.

7 CONCLUSION AND FUTURE WORK

This paper presents the research on investigation of problems with current knowledge sharing tools and the design of prototype Mybook. The investigation used survey and interview for data collection. The results guided the design of the Mybook which was then evaluated by five students. We received positive feedback about Mybook as an integrated social tool for knowledge sharing in the context of education. The findings from the user testing indicate that Mybook provides an easy-to-use technology for students to communicate online [4], share resources [6], participate in joint activities [5] and knowledge creation [7] efficiently.
Mybook was designed based on the students' interview results on Fronter only. Therefore, further research is necessary to study other LMS in order to generalize the results and identify other issues. Moreover, this study focuses mainly on students. There are also other stakeholders such as faculty members, administrators, who shall be included in the user-centred design process. Expanding the scope to include other LMS and stakeholders would improve the design of higher fidelity prototypes of Mybook.

Another limitation of the study is the lack of high fidelity prototype with complete functions. This limited the participants from conducting the tasks in depth. Hence it is difficult to tell if Mybook can really work well. With high fidelity prototype, perhaps more students can be invited for user testing as well to gain more insights into the usability of the prototype.

The combination of students' social activities and studies is very subjective as different students might have different perspective. As shown in the user testing, one participant was not convinced that combining both of them could actually motivate her to participate more actively in her studies. Hence, future work in the high fidelity prototype can also include having the option to disable social part of the website, if it is preferred by students. Students can then choose to have 'social' disabled while they do not want any interference from 'social'.

The testing result and questionnaire answers might be biased by students favoring the score for prototype. Therefore, it is recommended to have future testing which focuses on comparative tasks between existing method and the prototype in order to show if prototype is really more effective and efficient. Another problem that was highlighted, auto-translating language, shall be looked into in future work as well. Facebook, as the reference of the prototype does not auto-translate the posts made in other language into defaulted setting language.

The current low fidelity prototype is only sufficient to resolve problems of using multiple websites or tools and the graphical layout issue faced by students. Future work should focus on developing high fidelity prototype where more in depth user testing can be conducted with more actual tasks. All in all, Mybook as an integrated social interactive tool has the potential to promote the knowledge sharing among students or even with lecturers in the future.

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