STUDENTS' GOOGLE DRIVE INTENDED USAGE: A CASE STUDY OF MATHEMATICS COURSES IN BANGKOK UNIVERSITY

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ABSTRACT

Many technologies have changed the way individuals live and learn. Google Inc. has played significant roles in business and academic worlds. Google Apps for Education and Google Classroom have been offered to higher institutions around the globe. Although large cloud service provider such as Google do not encrypt all their stored electronic data and correlate identifiable data across accounts, Google Drive has been a popular feature of Google for teachers and students in Thai higher educational institutions. The purpose of this research is to explore the impact of message quality and digital literacy in terms of technological dimensions toward intention to use of Google Drive of Bangkok University's students. However, the four dimensions were extracted from fourteen statements. The factors were message quality, digital literacy in terms of learning new technology, digital literacy in terms of technical and IT skills, and intention to use. Furthermore, message quality, digital literacy in terms of learning new technology, and digital literacy in terms of technical and IT skills positively affected intended usage of the system.

KEYWORDS

Google Drive, message quality, digital literacy, intention to use, Thailand

1. INTRODUCTION

Google has official platforms for email and collaboration services customized for educational institutions' use. Starting in 2014, Google combined the power of Google Docs, Slides, or Forms into Google Classroom (classroom.google.com), a simplified learning management system for users of Google Apps for Education (Amanda and Katie, 2015). Teachers or students who sign up to use Google Classroom can connect to Google's other products. When a teacher or student starts a new class to his or her Classroom site, the process creates a folder within Google Drive with features that work specially with Google Classroom. On one side, instructors can get a folder that holds assignment and exercise templates as well as folder that holds copies of student materials. On the other side, students get a folder that stores their copies of documents submitted as assignments. Instructors can post announcements and assignments. Discussion forums can be used in the form of comments directly on the interaction pages without students having to go to separate forums or discussion tools. The most useful delivery method provided by this tool is that instructors can make a copy for each student which automatically adds a copy of the assignment to the student's Google Drive (Amanda and Katie, 2015). However, in 2015 the grading system provided by Classroom was not as sophisticated as other learning management systems like Blackboard or Moodle (Shiohara et al., 2014). Moreover, there were no comprehensive gradebook, test, or quiz features. Additionally, there are some privacy concerns since the actual applications of Drive, Docs, or Slides work the same way as those bundled with public accounts (Amanda and Katie, 2015). Misuse, sale of personal user data by vendors, lack of protection against hacking, and identity theft are additional concerns since large cloud vendors such as Google do not encrypt all of their stored electronic data and correlate identifiable data across accounts. Last

but not least, "loss of management control or intellectual property rights of materials uploaded to free cloud services is a potential barrier for creators of learning objects" (Weber, 2011).

However, Bangkok University, the first private university in Thailand, has implemented many learning management tools including Google Apps for Education. Teachers and students would receive Google's official platform for emails such as "krisawan.p@bu.ac.th" for a teacher and "vichaiyut.sara@bumail.net" for a student. Then, the collaboration customized tools for use at the university such as Google Docs, Slides, Forms, Sites, Classroom, as well as Drive are set up for teachers to use with their course materials.

Google Drive, is a file storage and synchronization service created by Google. It allows users to store files in the cloud, share files, and edit documents, spreadsheets, and presentations with collaborators. Google Drive encompasses Google Docs, Sheets, and Slides, an office suite that permits collaborative editing of documents, spreadsheets, presentations, drawings, forms, and more (Wikipedia, 2016).

The students can access the teachers' course materials through the use of Google Drive at any time with multiple devices like smartphones, computers, or tablets (Google Drive, 2016). Teachers can get a drive that stores their course materials and choose to share with specific student email addresses generating from the student email list creating by the university. Teachers can choose specific student email addresses to access the course materials as "CAN VIEW" option or "CAN EDIT" option. With "CAN VIEW" option, the students can only view the course materials. With "CAN EDIT" option, the students would be able to upload, submit, or share files in the drive.

Amanda and Katie (2015) suggested that students generally responded favorably to the Google tools. They are likely to have no worry about saving documents on the classroom computers due to the autosave feature and the use of Google Drive have made collaborating on assignments easier due to the sharing capabilities. Nevertheless, limited studies have investigated the learners' learning competencies. Therefore, this research's aim is to explore message quality and digital literacy in terms of technical dimensions affecting intention to use Google Drive of the students in Bangkok University. If learners' learning competencies are enhanced, it is likely to enable effective utilization of the cloud technologies in higher education.

2. RESEARCH METHOD

The researchers planned, created, and utilized Google Drive features throughout the third semester of 2015 (June - July 2016) for all the courses to share course materials such as lecture files, assignment details, pictures, and videos with specific student email addresses generated from Bangkok University's Student Email List system. Students could only have "CAN VIEW" option in some classes if there were no requirements for students to submit assignments back to the instructor. In other classes, students would have "CAN EDIT" option in order to be able to upload assignments back to the instructors as well as share files with their classmates. Survey and observations were used to collect data. The authors observed student behaviors in class as well as online. Before collecting data, the researchers met with participants at the end of the second semester of 2015 to explain the purpose of the study and acquaint them with the type of the questions they will be answering. The researchers collected the paper-based survey questionnaires from the students in their classrooms. Students spent approximately 15-20 minutes answering the questions. The samples in this study consisted of 151 students, who registered in Mathematics courses. The variables in this research are as follows: the independent variables are Digital Literacy: Technical Dimension (DLTD) and Message quality (MQ). The dependent variable is Intention to use (IEU). Concerning the reliability of the questionnaires, Cronbach's alpha coefficient values were in the following: Digital Literacy: Technical Dimension (DLTD) = 0.817, Message Quality (MQ) = 0.781 and Intention to Use (IEU) = 0.766. Then, all alpha coefficients passed the 0.65 (Nunnally, 1978) recommended level and had proven to be reliable. Descriptive statistics was used initially including frequency, mean, standard deviation for description of sample group demographics. The questions were grouped for Google Drive usage using the Exploratory Factor Analysis. Then, multiple regression analysis

3. RESEARCH RESULTS

The fourteen statements concerning the students' Google Drive usage were analyzed using principle components analysis with varimax rotation method to determine the underlying dimensions. In this process, the minimum Eigenvalue of 1.0 was used as cut-off. Only the constituent statements with factor loading of more than 0.5 were retained. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and the Bartlett's test of sphericity were used to test the fitness of the data (Wilailuk Sereetrakul, 2013). The result of KMO was 0.856 and the Bartlett's test of sphericity was found at the significant level of 0.000. These figures suggested that the use of factor analysis was appropriate (Hair, Anderson, Taham, & Black, 1998). This technique allowed the researchers to answer questions about which measures varied in explaining the highest percentage of the variance in the dataset. This factorial validity helped to confirm that a certain set of measures did or did not reflect latent constructs (Straub, 1989). However, the four dimensions were extracted from fourteen statements. The factors were message quality, digital literacy in terms of learning new technology, digital literacy in terms of technical and IT skills, and intention to use. The cumulative percentage of explained variance was 64.369% which mean that four factors could explain 64.369% of variation of students' Google Drive usage.

Then, multiple regression analysis by enter method determined the contribution of dependent variable to predict intention to use (IEU). The three predictors identified by factor analysis which were message quality (MQ), digital literacy: learning new technology (DLTD1-4) and digital literacy: technical and it skills (DLTD5-6). Factors affecting on intention to use (IEU) of Bangkok University's students with the level of statistical significance at 0.05, arranged in respective sequences of the high-level to low-level affecting factor, were message quality (MQ) (standardized beta coefficient of 0.287), digital literacy in terms of learning new technology (standardized beta coefficient of 0.273) (DLTD1-4), and digital literacy in terms of technical and IT skills (standardized beta coefficient of 0.194) (DLTD5-6). All those factors could explain the intention to use the Google Drive of Bangkok University's students at the 37.80 percent of variance.

4. CONCLUSION

Google Inc. had played major roles in business as well as academic worlds. Google Apps for Education has been offered to universities around the world. Although large cloud service providers like Google do not encrypt all their stored electronic data and correlate identifiable data across accounts, Google Drive has been one of a key feature of Google for teachers and students in higher educational institutions. This study revealed that the overall view of the total mean scores of the variables showed that the users were likely to have moderate agreement for message quality, digital literacy in terms of technical dimension, and intention to use the system. Moreover, the four dimensions (instead of the original three dimensions) were extracted from fourteen statements, which slightly differed from past researches (Handa, 2001; Ng, 2012). Therefore, the four factors were message quality, digital literacy in terms of learning new technology, digital literacy in terms of technical and IT skills, and intention to use. Furthermore, message quality, digital literacy in terms of learning new technology, and digital literacy in terms of technical and IT skills respectively affect intent to use of Google Drive of Bangkok University's students. These results are supported by past literature (Handa, 2001; Huang et al., 2009; Lee et al., 2016; Ng, 2012). It is recommended that university administrators and teachers should emphasize message quality, digital literacy in terms of learning new technology, and digital literacy in terms of technical and IT skills to optimize the benefits of using Google Drive in their universities. The limitation of this study was that the data was collected from students coming from one university only; therefore, data collection from more universities should provide clearer view of the results. Also, longitudinal survey of this study may improve the generalizability of the results for higher institution education. Further studies should also include cultural dimensions to the conceptual model to explore different perspectives of the students.

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