A Study on the Application of Google Classroom for Problem-Based Learning

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Abstract  Problem-based learning (PBL) appears to be a superior and effective strategy to train competent and skilled practitioners and to promote long-term retention of knowledge and skills acquired during the learning experience. This study concerns the implementation of PBL in the online environment and face-to-face PBL. An online environment allows participants to communicate with one another, view presentations or videos, interact with other participants, and engage with resources in work groups. Nowadays, education is accessible everywhere with the use of digital devices. Educational institutions subscribe to GSuite for Education, and Google introduced its Google Classroom as an e-learning platform. This study aims to analyze Google Classroom and to design PBL for Mongolian students taking Korean courses. The main objective of this paper is to identify the usability and evaluation of Google Classroom. The result of this study will be a proposed e-learning platform for Dormod University, Mongolia, which is initially needed in the Natural Science and Business Department.

Keywords : communication, Educational Instruction, E-learning, Google Classroom, PBL

1. Introduction

The classical definition of Problem-based learning (PBL) is the learning that results from the process of working towards the understanding of a resolution of a problem. The problem is encountered first in the learning process[1]. For PBL, Google Classroom is designed in this study. Google Classroom is meant to help instructors manage the creation and collection of students’ assignments in a paperless environment, basically leveraging the framework of Google Docs, Drive and other Apps. The objectives of this study is

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to identify the usability of Google Classroom in PBL for Dornod University, Evaluate Google classroom based on the feedback from the instructors, and lastly identify the usability and features of the tool based on Mongolian Students taking up Korean Courses. The study was conducted during the Midyear of 2018 in a Korean Course class at H University. This study contains Research needs in Chapter 1, Review of the literature, the methodology in Chapter 2 and the summary in Chapter 3.

2. Main body

2.1 Learning Environment in Mongolia

Mongolia’s educational system has undergone major changes in the 20th century. The educational reforms during communist times were a stark break with traditional education that was often religious and esoteric. Mongolian’s demand for information technology (IT) goods and services boomed as its young and adaptable population embraced IT products for personal and professional uses. Initial distance learning methods were radio and TV classes, covering the contents of reference books, publication, and related materials. Currently, due to the rapid development of information and communication technologies, lecture contents are being delivered by CD, DVD, online lectures and video lectures[2].

2.2 PBL instructional design process based on Google Classroom

PBL refers to an instructional and curricular student-centered approach that empowers students to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem[3]. It has since been employed successfully, in teaching various subjects at all levels of school from elementary to tertiary[4]. Google Classroom is a program for instructors to create a digital classroom for students to communicate with their instructors and peers. It is a free application that integrates e-mails and documents to save into storages. Instructors can upload files, videos, links, announcements and assignments for students to retrieve and view. Document files can be edited in class and shared with peers to learn collaborative skills. An instructor can keep all files save in the Google Drive and grade, attach you tube or any link for instructional purposes.

Analysis

Analysis related to the effectiveness of PBL in education revealed that PBL has positive effects on student’s satisfaction in training and skills development. Another review of learning curriculum on the effects of PBL on developing students’ critical thinking showed a positive relationship between the implementation of PBL as an instructional model and improvements in critical reasoning. Learning curriculum, student and learning environment were analyzed[5].

Design and Development

Google Classroom can be easily deployed in the URL classroom.google.com, instructor can set up classroom in minutes and create contents for students. It is free for schools, best -in -class security is also included without cost for plan holders. The platform is also integrated with other Google tools to help educators provide instant feedback and track student’s progress to improve performance, it has also a mobile application for easy access anytime and anywhere.

Implementation

In order to determine the usability of Google Classroom as an online learning environment, Students were asked to sign up for Google account or use their existing Gmail account. The class code was given to the students to enter the online classroom. After testing, a self-made questionnaire was used to determine the usability based on the perception of students.
Evaluation

The Evaluation Design Phase used to develop evaluation tools and items that determines whether students achieve learning objectives or not. Evaluation is done to acquire learning objectives and close relation, PBL evaluation standards and objects are based on PBL objective[6].

Modification

Modification phase with content made from formative evaluation phase. Modified PBL is improved method version by combining self and co-students evaluation of the learning program. Problems are modified during developing process but the problem will be ready after finishing the final revision.

2.3 Google Classroom model Design

An instructor can keep all the files save in the Google Drive and grade, attach you tube or any link for instructional purposes[7]. From Google Classroom, an instructor can send mail to all students at the same time. Janzen, M. (2014), points out the following benefits of using Google Classroom[8].

Easy to use - It is very easy to use. "Google Classroom’s design purposefully simplifies the instructional interface and options used for delivering and tracking assignments; communication with the entire course or individuals is also simplified through announcements, email, and push notifications."(Janzen, M. 2014)

(1) Saves time

Google classroom is designed to save time. It integrates and automates the use of other Google apps, including docs, slides, and spreadsheets, the process of administering document distribution, grading, formative assessment, and feedback is simplified and streamlined. Chehayeb, A. (2015), Google Classroom Software Engineer mentions that they built classroom "to save time". He claims that Google is launching some features like export grades to Google Sheets, easier to update grade point scale, keyboard navigation for entering grades, sort by name on grading page etc to save instructors' time.

(2) Cloud-based

Google Classroom presents more professional and authentic technology to use in learning environment as Google apps represent "a significant portion of cloud-based enterprise communications tools used throughout the professional workforce." (Mary, 2014)

(3) Flexible

This app is easy to use and accessible to instructors and students in both face-to-face learning environment and full online environment. This enables educators to explore and influence "flipped instructional methods more easily as well as automate and organize the distribution and collection of assignments and communications in multiple instructional milieus." (Mary, 2014)

(4) Free

Google Classroom in itself is not necessarily available to students without access to an educational institution. Can access to all the other apps, such as Drive, Docs, Spreadsheets, Slides, etc. simply by signing up for a Google account.

(5) Mobile-friendly

Google Classroom is designed to be responsive. It is easy to use on any mobile device. "Mobile access to learning materials that are attractive and easy to interact with is critical in today's web connected learning environment."(Janzen, M 2014) Keeler, A. (2014) also mentions several other benefits of using Google Classroom. She mentions how Google Classroom ensures streamline counseling only by posting an announcement. Crawford, A. R. (2015) states that Google Classroom facilitates collaborative learning. Here, the instructor can upload materials and give feedback to students. Students can also upload
materials and make personal comments. Moreover, students can collaborate with each other. They can share their documents and assignment thus, they can come up with their best assignment or work. The Google Classroom model focuses on the components in ensuring the effectiveness of the PBL<fig1>. Description of each of the elements found in PBL components are as follows: Firstly, instructor gives instruction about learning objectives, class teaching methods, assessments, evaluation, criteria and features of PBL in an off-line environment.

(1) Stream and Announcement
Use them to give notices to students. Announcements are shown at the top of the class stream. In this part, prepare the problem for PBL. Identify the learning objectives and pose questions on it. Instructor presents a problem on Announcement in PBL.

(2) Discussion board
Students can have online discussions with Google Classroom using Google+ Community, Forum and Assignment.

(3) Google Drive and Gmail
Students can access store files anywhere and keep all documents in one place with a shared team folder including scan documents and images as PDFs with phone. In Gmail instructor and students can send professional email to each others.

Classroom weaves together Google Docs, Drive and Gmail to help teachers create and organize assignments quickly, provide feedback efficiently, and communicate with classes with ease.

And it lets students organize their work, complete and turn it in, and communicate directly with their teachers and peers[9]. This section helps self-regulated learning, planning, writing solution easily in PBL process.

<table>
<thead>
<tr>
<th>INPUT (Google Classroom)</th>
<th>Process</th>
<th>Roles</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional classroom</td>
<td>Short lecture -Introduction of PBL based on Google Classroom</td>
<td>Instructor</td>
<td></td>
</tr>
<tr>
<td>Stream -Announcement</td>
<td>Present Problem - Analyze the problem</td>
<td>Instructor</td>
<td></td>
</tr>
<tr>
<td>Discussion board - Forum - Assignment - Google+ Community Post</td>
<td>Cooperative learning space used to find a solution</td>
<td>Student to Student</td>
<td></td>
</tr>
<tr>
<td>Google Drive and Gmail</td>
<td>Self-regulated learning</td>
<td>Student</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ruminate in Planning to solve problems</td>
<td>Student</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Write solution</td>
<td>Student</td>
<td></td>
</tr>
<tr>
<td>Google Forms</td>
<td>Present solution and Evaluation</td>
<td>Student - Instructor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Arrangement and reviews</td>
<td>Student</td>
<td></td>
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<tr>
<td></td>
<td>Write reflective journal</td>
<td>Student</td>
<td></td>
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<tr>
<td></td>
<td>Submission of reflective journal</td>
<td>Student</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Feedback of reflective journal</td>
<td>Instructor</td>
<td></td>
</tr>
</tbody>
</table>

Fig. 1. Google Classroom mode

(4) Google Forms
With Google forms, it manages event registrations, create a quick opinion poll, and much more. Create and analyze surveys right in mobile or web browser, no special software is required. Get instant results as they come in. And, can summarize survey results at a glance with charts and graphs. Presenting solution and Evaluation, Arrangement and reviews, Writing reflective journal, Submission of reflective journal and Feedback of reflective journal take place in Google forms. It gives the result of PBL process using Google Classroom. And shows the advantages and gaps of using Google Classroom application in PBL. Students can share and discuss the report using Drive Presentation easily.

2.4 Role of instructor
Instructor needs a well-structured plan and implement scaffolding activities in a way that it will help the students better understand and thus better
perform the tasks they participated in. Activity of Instructor is composed of presenting the problem, checking the problem solving process, upload classroom materials, feedback and arrangement in Problem Solving process. Instructor can interact in assignment, group chat, classroom folder, About, Assignment of Google Classroom<Fig2>.

<table>
<thead>
<tr>
<th>Where</th>
<th>What to do</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment</td>
<td>Present problem</td>
<td>Instructor</td>
</tr>
<tr>
<td>Group chat</td>
<td>Check the problem solving process</td>
<td>Instructor</td>
</tr>
<tr>
<td>Classroom folder</td>
<td>Upload classroom material</td>
<td>Instructor</td>
</tr>
<tr>
<td>Group chat</td>
<td>Feedback</td>
<td>Instructor</td>
</tr>
<tr>
<td>About</td>
<td>Feedback to Uploaded materials of students</td>
<td>Instructor</td>
</tr>
<tr>
<td>Assignment</td>
<td>Arrangement of Problem Solution Set</td>
<td>Instructor</td>
</tr>
</tbody>
</table>

Fig. 2. Activity of Instructor in Problem Solving process

2.5 The Role of student

Students work in teams to complete the project, resolve the problem, and accomplish the learning objectives. The student’s role come into play after the context, domain knowledge and problem statement had been developed, reviewed and refined[10]. After the group agreed on a view of the problem, students in the group worked to outline individual learning goals and set a schedule to refer to as the group members proceeded in the problem-solving process.

3. Implementation

This study was conducted on 18 Mongolian students taking up Korean courses. Of the 18 students, 5 were male and 13 were female. Their ages ranged from 17-33. In terms of language background, participants were fairly homogeneous; all of them were native Mongolian speakers and few had experiences living in Russia and other Chinese-speaking country. The students were divided into 6 groups. All groups took the face-to-face course every week. After each class they were required to review what they had learned in the class and to answer the exercises in the textbook. For the review activity, groups were asked to use Google Classroom for online discussion, interaction, and sharing information with each other, while those in the control group were asked to do their assignment and review the course content offline and individually. The course is one of the element design courses that was offered in the first semester and was newly introduced in the current year. For the development of such teaching-learning environment, Google Classroom was used. The research was carried out for 11 weeks. The course’ objective is to improve the Korean knowledge and its application in everyday use. The classes meet for 90 minutes in a day and were taught entirely in Korean. Google Classroom automatically marks an activity completed based on criteria, which can be specified depending on the activity. Students were able to evaluate and gave feedback on their performance in getting the appropriate information, gave ideas and opinions and developed teamwork as well as evaluation of the other team members. Google Classroom is easy to use and communication is comfortable too.

4. Conclusion

This study investigated the effectiveness of using Google Classroom application in PBL. The findings of this study demonstrated that the adoption of the Google Classroom as an online environment in PBL is successful and effective in developing students' knowledge. This new attempt could help enhance and improve the quality of learning instruction by breaking the monotony of the traditional classroom, and opening a new avenue for learning. Google Classroom based PBL extended learning opportunities beyond the
traditional classroom since it can overcome the restrictions of time and space. Accessibility, and easy-to-use communication tools of online environment increased students’ participation and involvement in learning process. In addition, effective and convenient collaborative learning is possible because students could interact and communicate with one another whenever and wherever they want even after the class. PBL based on Google Classroom was perceived positively by students and most of the students agreed to its effective contribution to their development. More rigorous research is needed to further examine the effects of PBL on student learning outcomes and performance in both academic and workplace situations.

References


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