

Using Schoology in Calculus Course

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Abstract. In this digital era, calculus course by using technology offers learning experiences meaningfully for university students. One of the technologies that can be used is schoology. This technology offers opportunity for lecturer to do blended learning, combination of face-to-face learning in the classroom and online learning outside campus. Therefore, the aims of this research were to describe how the use of schoology in calculus course and the student responses about it. The data was collected by observing and interviewing subjects. The subjects were industrial engineering students in class B, Universitas Muhammadiyah Surakarta, academic year of 2017/2018. The results were the use of schoology included sharing materials, assignments from lecturer to students and collecting tasks by the students via online. The student responses showed that schoology helped them to learn the materials, do the exercises first before attending the class, and facilitated them to collect tasks. However, the use of it was not optimum because of only for few meetings. Then, explanation and confirmation from the lecturer was important part in calculus learning process.

Keyword: blended learning, calculus, schoology

1. Introduction

Sophisticated technological developments have implications for classroom lectures. Traditional lectures are less relevant to the requirements of the 21st century. It also can make students become bored.

Nowdays, one of the trends of learning process in the 21st century is blended learning. Blended learning accomodates lecturers and students that have high mobility to make interaction. According to [1] blended learning is a learning that combines the technology and traditional instructor-led training in the room. The students can develop personal responsibility through blended learning. They are challenged to create meaning based from the content and process they encounter [2].

Blended learning currently uses Learning Management System (LMS) platform. Based on [3], LMS is a management system that allow teachers to provide taeching materials, organize and evaluate the learning process. One of the open source of LMS is schoology.

Schoology is appropriate for calculus course because calculus materials have a lot of theories. Hence, by using it, the students get more additional theories outside campus hours individually. In the classroom, they can discuss about the difficult materials and do more exercises. Reference [4] state that blended learning based on schoology can be a solution to overcome the learning process that requires a lot of theories. There will be time for discussion between peers outside of campus to learn

together in schoology. Therefore, using schoology as interactive media in calculus course improve students learning experince potentially.

The findings in blended learning come from [5] which state that the level of students satisfaction and their learning outcomes is higher compared to traditional learning. Reference [6] conclude that the use of blended learning with LMS is more effective than traditional methods to develop students writing skills. The research from [7] state that blended learning by using LMS can enhance learning motivation and students understanding in algorithm and programming course.

Based on the explanation above, the questions research are 1) how the use of schoology in calculus course?, 2) how the student responses about using schoology in calculus course?. Therefore, this research aims are to describe how the use of schoology in calculus course and the student responses about it.

2. Literature Review

2.1. Blended Learning

The term of blended learning at first used for describe course which tried combining face-to-face learning with online learning [8]. Based on [2], blended learning is mixed of online and face-to-face learning experince when teaching the students. In a blended learning course, students attend a class taught by a teacher in traditional classroom setting combine with online components course outside of the classroom.

According to Bersin, blended learning is a learning that combine the technology and traditional learning in the room. Moreover, it states that blended learning adds the time allotment of the subjects with cyberspace facilities [4].

Based on [9], there are four characteristics of blanded learning: 1) learning combines technology, 2) combination of face-to-face, independent, and online learning, 3) combination of effective learning, 4) teachers and parents are facilitators and supporters.

2.2. Learning Management System by Using Schoology

Learning Management System (LMS) is a platform or software application for online learning activity. The platform is by design or by utilization. Rouse explains that LMS provides an instructor with a way to create and deliver content, monitor students participation, and assess students performance. It also provide students to use interactive features, for instance threaded discussion and discussion forums [2]. Some free and popular LMS platform are Quipper School, Edmodo, GeSchool, Moodle, and Schoology [10].

Schoology is a free web-based education application which allows teachers to give lessons to students digitally. It is adopting Facebook as an interface and feature for ease of use [11]. It had received award as the best educational apps in 2013, 2014, and 2015 [4]. Moreover, it is available for Iphone or Android mobile devices. The students can submit assignments, take tests, make comments, ask questions, and access to resources in their course via online [12].

Schoology has advantages that are not found in others LMS, such as Moodle and Edmodo. Amiroh says that moodle is identical to blog on the website. Edmodo only support quizzes, assignments, and polls in the learning process. Meanwhile, schoology can support quizzes, tests, discussions, and assignments. Furthermore, edmodo can not accomodate a questions bank, send messages, and record students attendance likely in schoology [4].

2.3. Calculus Course

Calculus course offers students on basic materials mathematics such as functions, limits, derivatives, integrals, and applications. It is not just learned by university student that study on mathematics and mathematics education field, but also on other field, such as technique, informatics, and computer science [13].

According to [14], all the areas in undergraduate mathematics, calculus has received the most interest and investment in the use of technology with an increased number of innovative approaches.

Reference [15] states that technology utilization is an effective step in helping students to improve their thinking, thus students can solve mathematical problems. Furthermore, the use of technology in course will give easiness for lecturers to visualize calculus material. By using technology in the learning process, lecturers can display graphics or numerical calculations without spending time on drawing first [16].

3. Methodology

This research was descriptive qualitative that describe how the use of schoology in calculus course and how the student responses about it. In this research, the subjects were industrial engineering students in class B Universitas Muhammadiyah Surakarta (UMS) academic year of 2017/2018. They attended virtual class in schoology and real class by face-to-face since May until June 2018 (seven meetings). After that, an interview was conducted to six students to get responses after learning calculus by using schoology.

In this research, the data was collected by observing and interviewing the subjects. Observation was done by observing the students activities in the real class and virtual class in schoology. Meanwhile, the interview process was done on Friday, 6 July 2018, to six students based on their activities and assignments result. Data collection instruments consisted of observation sheet for calculus learning process and guide line sheet for interviewing subjects.

According to [17], data analysis techniques that was used in this research consisted of: 1) data reduction: determining who were the students that must be interviewed based on observation of the learning process. Then, six students picked for interview, 2) data presentation: the activities of the six students in the course were presented as interview materials, 3) made conclusion: comparing the students activities in the course to the interview results find out their responses about learning calculus by using schoology.

The next step was making data legality test by using triangulation method. It was conducted by comparing the students activities in the course to the interview results.

4. Result and Discussion

Calculus is studied by even semester industrial engineering students in Universitas Muhammadiyah Surakarta. Calculus materials had a lot of theories, consisted of concepts of integral and many applications, such as determine the volume of rotating objects, the area of a plane, the length of a curve, etc. Therefore, in the middle course, after mid semester test, blended learning was used in calculus course for seven meetings.

Blended learning in this course consisted of face-to-face learning in the real class combined learning by using schoology in the virtual class. The materials were the application of integral to determine: 1) area, 2) volume of rotating object, 3) arc length of a curve, and 4) moment and center of mass.

Schoology supported the lecturer to provide taeching materials and quiz also organize and evaluate the learning process. But, in this research the use of schoology is limited only for sharing materials and assignments from lecturer to students and also collecting student online tasks. The view of virtual calculus class in schoology was presented in figure 1 as follow.

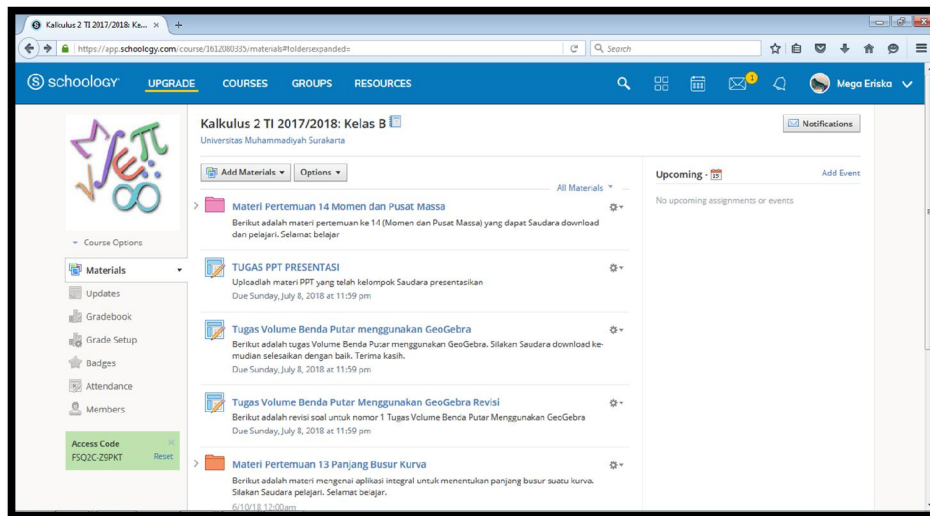


Figure 1. The View of Calculus Class in Schoology

In summary, calculus course was held by the lecturer as follow.

- 1) The lecturer gave materials through schoology to be studied by students first before face-to-face learning in real class.
- 2) In face-to-face meetings, the lecturer asked the students in groups to present the materials.
- 3) The lecturer gave explanation and confirmation.
- 4) The lecturer gave problems to be discussed by the students, followed by correcting them together.
- 5) The lecturer gave assignments (individuals or groups) through schoology and asked students to collect them online.

In addition, the view of calculus material and assignment uploaded by the lecturer in schoology was presented in figure 2. Meanwhile, the view of collecting online tasks by the students was presented in figure 3 as follow.

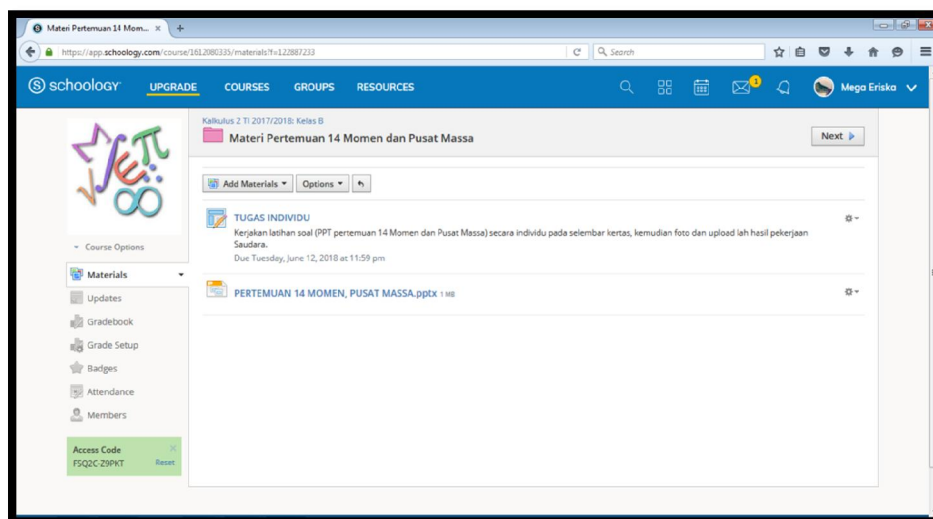


Figure 2. The View of Calculus Material and Assignment in Schoology

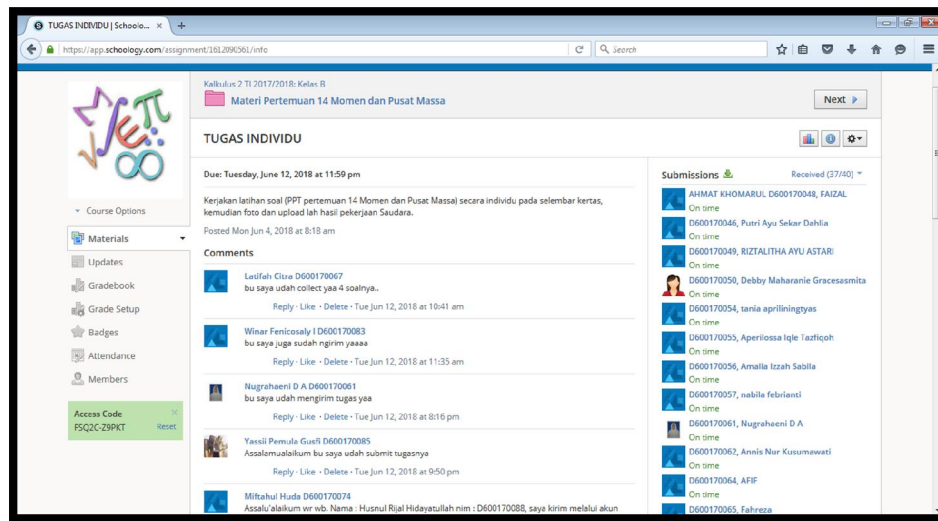


Figure 3. The View of Collecting Online Task in Schoology

Based on the interview process, it was noticeable that the students were interest and happy to use schoology for calculus course because it helped them to learn the materials and do the exercises first before coming to the class. Moreover, this technology also helped them to collect task by online.

This research reinforced the previous research from [18] which stated that schoology can interest in simulation course, more passion, make happy, easier to learn anywhere and more motivated to learn. Schoology also makes the students easy to do the task because it can be uploaded, thus the collection does not need come directly. It makes students more confident and responsible in their task [18] & [2].

However, from their prespective, the use of schoology was not optimum because only in seven meetings. In their view, direct explanation and confirmation from the lecturer in the classroom was very important part of the learning because they had difficulties to learn the calculus materials independently from schoology.

Furthermore, the students stated that there were some obstacles, such as there was no notifications when the lecturer sent task, thus they must be check it anytime. Then, sometimes the internet access in their home was not in a good condition to connect with schoology.

That points were similar with previous research from [2] which stated the heavy workload that students have in other subjects does not give them enough time to open schoology as often as possible and also the slow of Wi-Fi connection during their free time.

5. Conclusions

According to the points presented earlier, it can be concluded that: 1) the use of schoology in calculus course about integral application included sharing materials and assignments and collecting tasks via online, 2) the student responses to the use of schoology were vary, such as the use of schoology was not optimum because only for few meetings, schoology helped them to learn the materials first before attending the class, facilitated them to collect tasks, explanation and confirmation from the lecturer was important in learning for the students, some problems about the use of schoology, for example there was no notification when the lecturer sent tasks and sometimes the internet access was not in good condition to open schoology.

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