Project-based learning in out-of-class activities: flipped learning based on communities created in real and virtual spaces

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Abstract

This study focuses on the possibility of students creating communities in both real space (unoccupied classrooms) and virtual space using collaborative software. In the summer of 2016, a project-based learning initiative was launched to revitalise an unoccupied classroom in University of Marketing and Distribution Sciences; four first-year undergraduate students were selected to plan attractive events involving students across academic years and nationalities. Because it was conducted as an out-of-class learning experience, students, as coordinators, had to overcome space and time limitations in facilitating their projects. The qualitative data collected from interviews show the condition under which communities created in real and virtual spaces contribute for involving students in the revitalisation of the unoccupied classroom.

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1. Introduction

1.1. Background of Japan

In the coming years, Japan’s population will shrink dramatically because of the ageing of the Japanese society and country’s declining birth rate. The more the population shrinks, the more the number of unoccupied houses increases, along with the number of problems accompanying these trends. A similar phenomenon seems to be...
occurring in universities. Recently, universities have witnessed an increase in the number of unoccupied classrooms because of a decrease in students due to the decline in the college-aged population. For example, the number of college-aged people was 2.05 million in 1992, and it is expected to reach 1.17 million in 2018 [1].

This study was conducted at a university that showed a decrease in its student population and an increase in the number of unoccupied classrooms. The university launched a competition to revitalise an unoccupied classroom in the summer of 2016. The competition was designed as several out-of-class activities consisting of two parts: the first part concerned the use of an unoccupied classroom on the campus, and the second part pertained to an effective way of managing unoccupied classroom space on the campus. The winner of the competition was supposed to revitalise the unoccupied classroom as a coordinator.

1.2. Out-of-class study time

According to the National Survey of Student Engagement [2], Japanese students, on average, commit fewer hours per week to study compared with students in the U.S. For example, Fig. 1 (a) shows that approximately 60% of the students in the U.S. spend more than 11 hours per week on out-of-class study, whereas approximately 60% of Japanese students spend only 1 to 5 hours per week. For the university targeted in this study, more than 30% of students spend 0 to 1 hour per week on out-of-class study, although 64% spend 1 to 5 hours per week, which is higher than the average for Japanese students overall (57.1%).

Fig. 1 (b) shows the out-of-class study hours and purposes of study (assignment or non-assignment activities) for students in this university. Approximately 70% of students study 0 to 2 hours for an assignment, whereas more than 60% study up to 1 hour for autonomous or non-assignment activities.

These statistics indicate a crucial problem faced by Japanese universities, that is, the insufficient time spent by Japanese students’ on out-of-class study. Therefore, since a policy designed to substantiate the credit system was established in 1998, the Council for Higher Education in Japan has been tracking the out-of-class study time of students.

Fig. 2 (a) shows the total number of students who used the library from 2011 to 2015. Fig. 2 (b) shows the total number of students who used the media centre from 2011 to 2015. Except in 2013 and 2014, the number of students using the media centre does not show any major changes.

Fig. 3 shows (a) the annual (2015, 2016) and monthly changes in the total number of students using the university library and (b) annual (2015, 2016) and monthly changes in the total number of students using the media centre at the university. The final examination periods (at the end of June and of January) mark the times of peak usage.

The university renewed the layout and furnishing of its library and media centre and, in 2016, and launched a learning commons – which lets students interact, read, and study individually and collectively using books, references, and the Internet in the library – to increase the number of students who use both the library and media centre.
According to librarians, the number of students using the library increased after the renewal of the layout and furnishing; however, the number of students using the learning commons has not yet increased in such a manner.

During the final examination periods (at the end of June and of January), which mark the times of peak usage, education-related tasks (e.g. assignments) encourage students to use the library. This intentional planning of learning content (e.g. assignments) and methods (e.g. flipped learning) influences the number of students using not only the library but also the media centre and learning commons.

1.3. Purpose of this study

Once they were chosen to promote the revitalisation initiative, the four first-year undergraduate students started planning attractive events to involve other students in the revitalisation of the unoccupied classroom, irrespective of their academic year and nationality. Because this project has been carried out as out-of-class learning, they had to find a way to overcome space and time limitations to facilitate the project, for instance, they could exchange information and opinions for planning events interactively, create documents collectively, and share photographs and information. Finally, they combined several collaborative software programs to meet their needs instead of...
using the information and communications technology environment offered by the university, which has various constraints. This study aims to explore the conditions under which communities created in real and virtual spaces encourage the revitalisation of unoccupied classrooms as out-of-class activities.

2. Project-based learning based on the communities created in both real and virtual spaces

2.1. A project to revitalise an unoccupied university classroom

The unoccupied classrooms are in the former infirmary and face the main courtyard of the university. The undergraduate students chosen under the revitalisation initiative proposed using this classroom space to enable overseas and Japanese students to interact, exchange various skills, and launch various miscellaneous projects.

Before presenting at the competition, the students used another unoccupied space (a former dressmaking shop) to organise an experimental social event on 16 November 2016. Currently, the shop owner of a mom-and-pop candy store uses it as an alternative space. Four Japanese and three Taiwanese students used it to conduct a cooking exchange, in which they could teach and learn about local specialities, and determine whether their proposal for the unoccupied university classroom would work.
After their proposal was selected, they began planning events to revitalise the unoccupied classroom that would involve other students across the campus, irrespective of their academic year and nationality. The first event, a potluck party called ‘Sharing Happy Lunch’, was held on 12 January 2017, in which approximately 20 students participated, including overseas and Japanese students. At the potluck, they exchanged food, knowledge, and experiences in a real space. They exchanged e-mail addresses and LINE accounts. LINE is a freeware application facilitating instant communications on mobile electronic devices.

The four selected students served as coordinators during the revitalisation of the classroom using both real and virtual spaces. For example, they prepared for the first event by meeting at the university and using the learning commons in the library as a real space. They also exchanged ideas, opinions, information, documents, photographs, and movies and adjusted their schedules on LINE as a virtual space. Fig. 5 shows a feature that displays e-mail addresses and a common Microsoft OneDrive account that allows group members to produce and correct Microsoft Office documents, such as those produced in Microsoft Word, Excel, and PowerPoint, collectively; adjust each student’s schedule; share movies and photographs; and exchange information. Thus, participants were able to organise the first event by creating a community in both real space, such as their meeting at the university, and virtual space, such as collaborative software programs (e.g. LINE).

2.2. Exchange of experiences between students and members of the community in the unoccupied space

On 7 February 2017, the four selected students used the unoccupied space to hold a cooking exchange with Taiwanese students, and they proceeded to discuss the revitalisation of unoccupied spaces with members of the community. They shared experiences with more than 15 other participants in a real space.
3. Research

3.1. Interviews

Qualitative data were collected from interviews with the four students who served as the coordinators of the classroom revitalisation initiative using both real and virtual spaces. The questionnaires and the responses of each student are as follows:

- **Q1**: Remark on your interactions with the members of the community about the revitalisation of unoccupied spaces.
  - **Student A** answered as follows:
    - I could share my experiences on the revitalisation of unoccupied spaces with each member of the community whom I could not meet at the university.
  - **Student B** answered as follows:
    - Because I sat close to participants in the small space, I could express myself with them easily compared to the event held in the unoccupied classroom.
  - **Student C** answered as follows:
    - The experiences regarding the revitalisation of unoccupied spaces of each member of the community were so rich that I applied them to the revitalisation of the unoccupied university classroom.
    - I would like to keep attending interactive meetings with them.
  - **Student D** answered as follows:
    - It seemed to be quite difficult for me to share my experiences on the revitalisation of unoccupied spaces with each member of the community because of my lack of experience.
    - Since I hesitate to express myself to them, I need more time to interact with them.

- **Q2**: Remark on your interactions with students about the revitalisation of the unoccupied classroom.
  - **Student A** answered as follows:
    - It was difficult to let all the students know about the event.
    - It was easy to announce the event to overseas students who have already created their own community at the university.
    - Among Japanese students, only our friends to whom we could directly announce the event attended the event.
  - **Student B** answered as follows:
    - Although we put a big signboard about the event in front of the classroom, people did not notice it.
    - Compared to overseas students, only a lesser number of Japanese students attended the event.
  - **Student C** answered as follows:
    - It was difficult to facilitate discussions among participants because we could not make and share a timetable for the event.
    - I was surprised that overseas students participated in the event and rapidly shared their experiences at the event across the community.
  - **Student D** answered as follows:
    - The signboard was not effective in attracting students.

- **Q3**: Issues to be resolved for the revitalisation of the unoccupied classroom.
  - **Student A** answered as follows:
    - To create a community of Japanese students similar to the community of overseas students.
    - To announce the event to all the students.
  - **Student B** answered as follows:
    - To increase the number of Japanese students attending the event.
    - To complement the signboard in advertising the event.
  - **Student C** answered as follows:
    - To prepare for the event among students who facilitate the event from a distance.
    - To find any system that allows us to prepare for the event without meeting each other at the university because we are busy with our part-time jobs.
  - **Student D** answered as follows:
    - To announce the event to all students.
    - To attract all students so that they can participate in the event.
Q4: The use of collaborative software programs in this project so far.
Student A answered as follows:
- LINE for exchanging information and opinions.
- Microsoft OneDrive for storing documents.
- SketchUp for drawing interior perspectives of the classroom.
Student B answered as follows:
- LINE for exchanging information and opinions and calling and adjusting the schedule for the meeting.
Student C answered as follows:
- LINE for exchanging information and opinions and sharing documents.
Student D answered as follows:
- LINE for exchanging information and opinions.

Q5: The features of collaborative software programs to be implemented for this project.
Student A answered as follows:
- To exchange information and opinions.
- To create various groups to offer an opportunity for students to plan new events.
- To create and correct documents (PowerPoint, Excel, Word, etc.) collectively.
- To store and share documents and photographs.
- To adjust, share, and manage schedules collectively.
Student B answered as follows:
- To use video chat to enable chatting and discussion among students.
Student C answered as follows:
- To use video chat to enable chatting and discussion among the students preparing for the event.
- To create a community of students like the community of overseas students.
Student D answered as follows:
- To announce the event to all the students, along with educators and administrative staff at the university.

Q6: Suggestions for implementing the required features.
Student A answered as follows:
- Use Cybozu Live to exchange information and opinions.
- Use Cybozu Live to create various groups to offer opportunities for students to plan new events.
- Use Microsoft OneDrive to create and correct documents (PowerPoint, Excel, Word, etc.) collectively from anywhere.
- Use Microsoft OneDrive to store and share documents and photographs.
- Use Cybozu Live to adjust, share, and manage schedules collectively.
Student B answered as follows:
- Use Skype or Google Hangouts for video chats.
Student C answered as follows:
- Use LINE, especially the function called ‘note’, to exchange information and opinions, and create various groups to offer opportunities for students to plan new events.
Student D answered as follows:
- Use LINE to create a community of students, wherein announcements of events can spread easily and securely.
- Use the Twitter account of the university to announce events to the many students who follow the account.
- Students extensively use both LINE and Twitter.

3.2. A community created in a real space, such as the unoccupied space and classroom

The responses to Q1 indicate that the students learned new perspectives by sharing ideas with community members regarding the revitalisation of the unoccupied classroom. In other words, the community created in a real space offered the students an opportunity to learn. The responses to Q2 indicate the efficacy of the tight community created by overseas students in sharing and spreading information easily; it is noted that Japanese students do not have a similar method for announcing events easily and effectively because they lack a community.

The responses to Q3 indicate the conditions under which communities created in real space encourage the revitalisation of the unoccupied classroom. They also imply the need for virtual communities because the
coordinators needed some means of announcing the event to a large number of students to create a community of Japanese students similar to that of overseas students and prepare for the event without meeting face to face.

3.3. A community created in a virtual space, such as the unoccupied space and classroom

The responses to Q4 indicate that the participants are collectively using LINE to prepare for the event without meeting face to face. Although Student A created a common OneDrive account to produce and correct documents collectively, the remainder of the interviewees did not know how to use it.

The responses to Q5 show the conditions under which communities created in virtual space encourage the revitalisation of the unoccupied classroom. They indicate a demand for collaborative software programs that allow students to exchange information and opinions; create various groups that enable all the students to plan new events; create and correct documents collectively; store and share documents, photographs, and movies; adjust, share, and manage schedules collectively; and make use of the video chat feature. The respondents also think that a new community involving other students who are currently interested in the revitalisation of the unoccupied classroom should be created.

The responses to Q6 show the possibility of implementation of the revitalisation initiative using collaborative software programs. For example, the coordinators consider using either Cybozu Live or LINE, especially the ‘note’ function, to plan new events and adjust, share, and manage schedules collectively. The coordinators are willing to use Skype for collective video chats. They aim to utilise OneDrive to collectively store, create, and correct documents because it allows all devices in which Word, Excel, and PowerPoint are not installed to use these software programs to create and correct documents.

4. Results

The results of the interviews depict the conditions under which communities created in real and virtual spaces encourage the revitalisation of the unoccupied classroom as out-of-class activities. The community in real space requires the following functions: the interaction and exchange of opinions and experiences, the announcement of events to ensure the involvement of many students, and a method for coordinators to discuss and prepare the facilitation of the project. The community in virtual space requires the following functions: To discuss and prepare for the coordinators’ facilitation of the project; create, store, and share documents; and announce events widely.

Fig. 6 is a diagram showing the relationship between communities created in real and virtual spaces. It also shows the implementation of the features that combine several collaborative software programs to meet group needs. A real community is created in a real space, such as the unoccupied classroom or public space, and it is mirrored by a virtual community, as collaborative software programs offer a virtual space in which participants can interact with one another.

The sustainable maintenance and revitalisation of the unoccupied classroom requires the involvement of these two communities: the tight community composed of both the coordinators (the four students in this case) and the person(s) in charge of the space (the administrators and educators in this case), and the loose community composed of people who are interested in the space (other students who participate in revitalisation activities and utilise the unoccupied classroom in this case). Any student is accepted within the loose community, whereas the tight community is limited to coordinators, administrators, and educators.

5. Discussion

The results of the interviews show that the communities created in both real and virtual spaces unconsciously encourage students to become involved in the revitalisation of the unoccupied classroom, which reflects project-based learning in practice. The time spent on using collaborative software programs to plan the event can be interpreted as out-of-class study time based on project-based or flipped learning. In this study, the conditions of the communities created in both real and virtual spaces were analysed to encourage students’ out-of-classroom study – in terms of project-based learning – to revitalise the unoccupied classroom. Generally, flipped learning is supposed to be self-regulated, as pointed out by Çakıroğlu and Oztürk [3], for instance, when students watch movies and/or
videos to prepare for active learning in the classroom, as mentioned by Bergmann and Sams [4]. Therefore, students pursuing individual activities like self-regulated learning must have a strong will to achieve the goal.

However, university students do not spend sufficient time on out-of-class study; hence, a method to ensure that they unconsciously involve in this type of study is important to increase their out-of-class study time. As shown in Fig. 7, flipped learning based on communities created in real and virtual spaces presents a new form of learning in which individual activities are considered virtual space activities based on the community.

This study focuses on a real community and a virtual community. In these communities, students share a purpose, such as the planning of an event and steps required to realise this goal. It is noted that Wenger-Trayner and Wenger-Trayner [5] created the term ‘community of practice’. According to them, ‘communities of practice are formed by people who engage in a process of collective learning in a shared domain of human endeavour. Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly’ [5]. The community mentioned in this study represents a community of practice.

Fig. 6. The relationship between communities created in real and virtual spaces, and the implementation of the features of collaborative software programs to meet conditions.

Fig. 7. Flipped learning in (a) general lectures; (b) project-based learning based on communities created in real and virtual spaces.
6. Conclusion

Through qualitative research, this study explores the conditions under which communities created in real and virtual spaces encourage the revitalisation of the unoccupied classroom as out-of-class activities. In addition, tight and loose communities must coexist to maintain and revitalise the unoccupied classroom sustainably.

Although it pursues a novel topic, this study has several limitations. It does not specify the relation between participation in activities in the community and out-of-class study time. Further research is required to clarify this aspect. For qualitative research, this study conducted interviews and observed participants’ use of the unoccupied classroom and collaborative software programs. As a future direction for this study, we plan to perform quantitative research by formulating a questionnaire survey with components of both tight and loose communities to determine the time spent on particular activities in the communities created in real and virtual spaces and the students’ willingness to be involved in such communities.

References