Any Meeting: Mobile Application System for investigating students’ engagement

Minjae Park,  
Department of Human ICT Convergence  
Sungkyunkwan University  
2066, Seobu-ro, Suwon,  
South Korea  
vrotoss@gmail.com

Jundong Cho*  
Department of Human ICT Convergence  
Sungkyunkwan University  
2066, Seobu-ro, Suwon,  
South Korea  
jdcho07@gmail.com

ABSTRACT
In-class team discussion is considered as pedagogically motivated learning method. It reinforces students’ class participation. Through our mobile application system, Any Meeting, we suggest instructional strategies that elevate participation and interactive communication. This mobile application provides an opportunity for students to have a team discussion by simple manipulation during class. Through the team discussion, students enhance their understanding of class materials and engagement. Any Meeting not only generates in-class discussion among students but also supports communication between students and the instructor. Students use this application to communicate with their instructor instead of confronting the instructor face to face. Students ask questions, get feedback, and make unclear clear without interfering flow of the class. Using Any Meeting, students stay free from the anxiety of impeding the progress of classwork for clarifying confusing information. They raise hands, not physically but through their mobile devices, and request for the class discussion. The instructor, on the other hand, catches a sense of how well students comprehend the class materials, as he checks the number of hands raised up on his mobile device. Any Meeting supports both students and the instructor to communicate despite the size of the class. Even in large-scale lectures, students and the instructor interact with each other through Q&A system offered in the application. From user study, we have demonstrated that students adequately use Any Meeting in augmenting their understanding of class materials. The study shows positive relationship between our system and user satisfaction.

Author Keywords
Mobile applications system, Investigating students’ engagement, Team discussion, Class Interaction

ACM Classification Keywords
H.5.2. Information interfaces and presentation: User Interfaces

INTRODUCTION
Active engagement is the most important component for students in adapting new materials taught in class. Students’ class participation has been one of the most sizzling issues among educationists. Today, many students find themselves struggling to speak up during class. Increasing number of students and large-scale classes in universities has decreased in-class interaction and communication. Students are expected to develop and refine their ability to share their ideas with their peers and productively engage with class materials [1]. For these reasons, educators have provided group discussion activities as of a way to encourage class participation [2]. Group discussion supports students to brainstorm and think critically. Communicating with peers, students get better understanding of what they learn, how others think, and which stimulates their curiosity. However, due to cultural and religious background, Korean students have faced difficulties in expressing their genuine thoughts in classes. According to the Trends in International Mathematics and Science Study (TIMSS), which is an international comparative study of student achievement, Korean student’s participation was ranged as the lowest performing country [3]. Both student to student communication and students’ interaction with the instructor cannot be overlooked. Thus, supplementary instructional strategy that designs the class instructional style and works as the center of communication among students and instructors is necessary [4]. The use of technology can help overcoming such difficulties by supporting the interaction between students and the instructor.

Paste the appropriate copyright/license statement here. ACM now supports three different publication options:
- ACM copyright: ACM holds the copyright on the work. This is the historical approach.
- License: The author(s) retain copyright, but ACM receives an exclusive publication license.
- Open Access: The author(s) wish to pay for the work to be open access. The additional fee must be paid to ACM.
This text field is large enough to hold the appropriate release statement assuming it is single-spaced in TimesNewRoman 8 point font. Please do not change or modify the size of this text box.
In this paper, we present the mobile space for students and instructor that enables students to simply manipulate the system to attend a class discussion and to have fluent interaction with instructor.

RELATED WORK
As mobile technology advances, instructional strategies by mobile application have increased. Smart Clicker application uses a direct Q&A system between students and instructor to advance students’ understanding. [4]. Mobile application PinPong provides quiz system. Instructor can make a short-answer question, multiple choices and true – false quizzes. Students can directly answer the question; the result is visually presented on professor’s mobile display. Mobile applications benefit students to participate more enjoyably [5]. Socrative application, which is compatible for all devices, also presents short quiz and spontaneous polling, allows a student to get feedback, and besides instructor can browse a result of the quiz via MS excel format. [6]. Questionpress is Polling, surveys, forms, and online assessments tools. It is a system that the presenter posts questions on the webservers, the responders answer on the web browser [7]. Global IT Company Google also recently launched Google classroom. It offers a single dashboard and unified system for Google’s other services, such as Google Drive and Gmail. Therefore, instructor can easily deliver assignments and class materials to their students [8]. As diverse related researches have launched, IT services for instructor and students at classroom seem like they have been increased in the near future.

While various mobile applications and website for instructional strategies have released, they only focus on academics, such as quizzes, polling and tests. Our mobile system aims to not only stress academics, but also boost students’ social interaction between students and instructor in order to encourage participation. Through interaction among students and peer to peer review, students can learn and understand class materials more firmly.

SYSTEM DESCRIPTION
Our mobile application system is consisted of two parts, instructor and student users. Both instructor and students are able to use the application by easy manipulation during class.

For students, they can simply connect the application and request a team discussion by clicking a button, which indicates he/she needs a meeting (figure1).

Both instructor and students can check a number of students who want a team discussion. As soon as certain number of students requests a team discussion through Any Meeting application, the application notices the instructor with alarm, vibration, or blinking light that it has reached a threshold. Receiving the notice, the instructor can set up time for a group discussion. The point of this system is that the instructor and students get a sense of not only how well students understand the class materials, but also how many students want to supplement their information as they share their interpretation with their peers.
As shown in figure 2, through Any Meeting application, students can not only request a group discussion but also ask a question directly to the instructor. The application provides Q&A session where they can simply send their question without disrupting the class. Previous research demonstrated that developing mobile application can overcome the limits of interactions in the large scaled group education [9].

As shown in figure 3, the instructor, using the application, can insert total number of students and set a threshold value of a required number of students who want team discussion (e.g. if the instructor set a threshold value as five and a number of students who request team discussion reaches five, the instructor get a notice and can pause to let students have a team meeting). The instructor set up a type of alarm that rings when a number of students who wish to start a team discussion reaches the threshold. Generating a group discussion for students, the instructor does not baffle students but interact with students. In Any Meeting, the instructor can view the groups formed by students, check their attendance, answer their questions, and encourage them to present what they have discussed to class.

User Study
In order to demonstrate the relationship between our mobile system and user satisfaction, we conducted questionnaires and Likert scale of thirteen students and one professor from Perceptual Computing (HIC5005) at Sungkyunkwan University. Ten of them were male and three of them were female. And nine of them were graduate students and four of them were undergraduate students. Ahead of the lecture, we explained the function and the direction of our mobile application system, Any Meeting, for ten minutes. The class was consisted of three sessions and each session took one hour. User study was only conducted at the first session (figure 4, 5). For user study, we controlled several variables. If over six students of the thirteen students request to have a team meeting, we asked instructor to pause for a team discussion period.

As shown in figure 3, the instructor, using the application, can insert total number of students and set a threshold value of a required number of students who want team discussion (e.g. if the instructor set a threshold value as five and a number of students who request team discussion reaches five, the instructor get a notice and can pause to let students have a team meeting). The instructor set up a type of alarm that rings when a number of students who wish to start a team discussion reaches the threshold. Generating a group discussion for students, the instructor does not baffle students but interact with students. In Any Meeting, the instructor can view the groups formed by students, check their attendance, answer their questions, and encourage them to present what they have discussed to class.

User Study
In order to demonstrate the relationship between our mobile system and user satisfaction, we conducted questionnaires and Likert scale of thirteen students and one professor from Perceptual Computing (HIC5005) at Sungkyunkwan University. Ten of them were male and three of them were female. And nine of them were graduate students and four of them were undergraduate students. Ahead of the lecture, we explained the function and the direction of our mobile application system, Any Meeting, for ten minutes. The class was consisted of three sessions and each session took one hour. User study was only conducted at the first session (figure 4, 5). For user study, we controlled several variables. If over six students of the thirteen students request to have a team meeting, we asked instructor to pause for a team discussion period.

After the class, participants answered 10 questions categorized by four items: usefulness, ease of use, satisfaction, and intention of future usage. In addition, we conducted semi-structured interview with five students to ask pros and cons of the service provided in Any Meeting compared with other conventional lectures. All study carried out independently in a meeting room. One researcher guided questionnaire and planned the interview. The other researcher made observation and recorded user study. All recordings have been documented with the participant’s agreements (figure 6).
Result and Discussion
Group discussion has once been conducted during one-hour lecture using Any Meeting. Seven students requested to have the group discussion; the instructor noticed the necessity as his mobile device vibrated. Group discussion went for five minutes. Students shared their thoughts about class materials. During the lecture, students posted two questions on Any Meeting. The instructor waited until the end of class to answer the questions, for he was concerned about maintaining the flow of the class.

In the result of the question, it was commonly positive in that average of all four items were higher than 1.5 (Table 1). Most participants reported that this application system was easy to use (Mean = 1.68) and useful (Mean = 1.61). However, two of them reported that the system was not useful because they did not feel its necessity. Participants also indicated that they were satisfied using the application (Mean = 1.92). Three of them reported over 3 points. As an observation during the class, these participants especially well used Any Meeting. They pressed a button to request a team meeting whenever they felt ambiguity about class materials. Most participants reported the highest needs for future usage (Mean = 2.07). Yet one of them expressed that the application need an upgrade so that it reflects student user’s demands even more concretely. Since the intention of future usage got the highest point and usefulness got the lowest, we were able to assume that the mobile application Any Meeting is not yet ready to be commercialized or used in lectures right away.

According to the interview, some students expressed that when they gathered up for a team discussion through Any Meeting, they were able to communicate with each other comfortably, for they are on the same track. Furthermore, some of them mentioned that the application interface was easy to learn. Some negative opinions, on the contrary, were mentioned. Most issue participants pointed out was that student users have to put their smartphone on the desk for the use of this application. It can cause students not only do the other things unsuitable for the class, but also commit cheating.

<table>
<thead>
<tr>
<th>Ease of Use</th>
<th>Usefulness</th>
<th>Satisfaction</th>
<th>Intention of Future Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg</td>
<td>1.69</td>
<td>1.61</td>
<td>1.92</td>
</tr>
<tr>
<td>SD</td>
<td>1.38</td>
<td>1.68</td>
<td>1.77</td>
</tr>
</tbody>
</table>

Table 1. Average usability evaluation result of Any Meeting while using it in the lecture. (N=13, Avg: average scale by participants, SD: standard deviation, value between -3 and 3 on a 7 point rating scale)

Conclusion and Future Work
Any Meeting provides a new instructional strategy for participation and interactive communication as an opportunity for students to have a team discussion. Through the application, the instructor can stimulate students’ engagement in class. Providing mobile space for students and instructor, Any Meeting generates convenient communication and enhances effective interaction.

In the future research, we look forward to develop our mobile system through extensive user research and case study to support students’ in-class participation. Reflecting user research, we aim to develop function that fulfills the user’s need. Flaws that have been distinguished from the user study need to be upgraded. Issues regarding students’ class attitude for having their smartphone on the desk should be reviewed for the future research. Setting up several limitations for the smart device while using Any Meeting need to be considered.

ACKNOWLEDGMENTS
This research was supported by the Ministry of Trade, Industry and Energy (MOTIE), KOREA, through the Education Support program for Creative and Industrial Convergence (N0000717)

REFERENCES
8. Google Classroom, an education platform for teachers, opens to all Apps for Education users http://thenextweb.com/google/2014/08/12/google-