Using Technology to Enhance Class Participation

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ABSTRACT

Class participation is a good way to gauge a student's level of learning in any given course. The interaction that students have during class is not only useful for securing and strengthening the knowledge they have acquired, but it also helps develop the necessary oral communication skills they will frequently use for the rest of their professional careers. Thus, the problems of low student attendance and participation during classes must be addressed in an effective way. This study explores an approach taken using a mobile application. Students were asked to express their perceived feelings when they were graded using said application, and their answers show a positive change in their course experience.

Keywords – class, participation, mobile, technology, teaching

INTRODUCTION

Class participation is an important aspect of student life. Students can learn from each other when participating, and if class participation is a requirement for course credit then students will have an extra motivation to study and secure the knowledge they've acquired in class. However, students might be reluctant to participate for several reasons. Also, when the teacher fails to clearly define participations, there are detrimental effects which range from confusion on behalf of the student up to an ineffective way of grading said participations; this means that an objective definition of class participation and its grading has to be established. This study asks several questions:

How can students be encouraged to participate more in class? Students can sharpen their oral skills and confidence when participating in class, and the classmates can learn from each other's answers. Thus, meaningful student participation is relevant both on a personal level as well as on a collective level, and encouraging participation is on the best interest of the students and their classmates.

Are there any benefits of having an objective definition of class participation? A rigid system of rules and guidelines for class participation and grading can be provided at the beginning of the academic period, and both teacher and students can be expected to adhere to it. However, are there any benefits that arise from this?

The use of technology in the classroom can transform education [1], so a better learning experience can be achieved by a methodical approach where technology is used as a leveraging tool. Is there a way to enhance class attendance and participation using technology?

LITERATURE REVIEW

The various definitions of class participation try to take into account and encompass in-class dynamics, sometimes considering the differences between "talker" and "non-talker" students [2]. A neutral definition under the EFL context was suggested by Crosthwaite, Bailey and Meeker [3], where class participation is defined as the act of "playing an active role in all in-class activities". Reference [4] reports a model of comfort with class discussion, and this model was further used by Dallimore, Hertenstein, and Platt [5] when examining the relationship between class participation and individual student learning, as well as relationship between student comfort and learning. The Dallimore, Hertenstein and Platt study suggests that knowing these connected relationships should be a driving force so that instructors motivate students into participating more in class. In turn, this increased participation "should lead to increased student mastery of course content".

The uneasiness or unwillingness that some students might experience when discussing orally during class might be caused by a number of factors, such as large class sizes or a lack of interest [6]. The effects of this communication apprehension have been documented; Croskey, Booth-Butterfield, and Payne [7] noticed that a high communication apprehension in students translates into a lower academic performance, as well as a higher dropout rate.

Mello [8] suggests that graded class participation is desirable in order to help overcome some of these difficulties that students may have. A set of systems that the instructors can use in order to both help their students and themselves when grading class participation is important not only because it promotes class participation, but rather because the motivation to participate will enhance individual student learning. Bourhis, Allen, and Bauman [9] have identified the negative impact that communication apprehension has in the student's learning environment, noting the importance of "active participation on the part of the student" (p. 217).

Mello lists several benefits of graded class participation [8]. He mentions some effects such as better student preparation, as well as encouraging students to share personal experiences. He, however, emphasizes the relevance of graded class participation as a preparation for a real-world job. (p. 81). The speaking, thinking, and listening skills that students develop

during class participation are empowering assets, for communication skills are "one of the most sought-after skill sets for the hiring of entry and mid-level jobs" [8].

TECHNOLOGY IN THE CLASSROOM

The ever-increasing use of technology both inside and outside of the classroom can be leveraged so that some of the issues that arise with class participation can be addressed. Online courses - or any course that has a significant online component to it - will evidently use technology to its fullest extent in order to assess class attendance, as well as grading participation. However, the nature of face-to-face courses might hinder the implementation of any technological aids. Putra [1] mentions however that "face-to-face interaction is irreplaceable". Thus, an effort must be made so that technology can enhance the class experience. Putra hints that the evolution of face-to-face learning is an ongoing process that can greatly benefit from the student's feedback. Therefore, a better learning experience cannot be guaranteed only by the use of technology, but rather by taking into consideration the student's feelings and perceptions towards the learning process itself.

METHODOLOGY

A mobile application called Class Participation was developed by Universidad Tecnológica (UNITEC) Honduras Research & Development, under Carlos Roberto Arias, Ph.D.'s direction. This mobile application allows a teacher to input all the students for all the sections of the courses he or she is giving in any academic period.

Class attendance at UNITEC is compulsory, since there is a limited number of times a student can miss class before they lose the right to take the exams. The assistance record of any given student is managed by a separate system implemented by the UNITEC Registrars office. Since this is an issue that has been solved under those circumstances, the Class Participation application doesn't register if the student has attended all the lectures, nor does it register when the student was absent.

Class Participation, however, does register when a student hasn't been able to answer a question (either because they didn't want to participate, didn't know the answer to the question, or because they were absent). This feature allows the teacher to keep track of the participations during the whole academic period, thus providing an aid in the final grading process.

In order to select a student from any given section for a random participation, the following algorithm was implemented in Class Participation:

Let R be a random variable following the discrete uniform distribution over the set $\{1, 2, 3, 4, 5, 6\}$. If $R < 4$, select the student from the current section with the fewer number of participations. If $R > 3$, select a random student from the current section.

During the second academic period of 2016, the students of Data Structures and Theory of Computing were graded using Class Participation. These students were tasked with answering an anonymous survey at the end of the academic period; the survey listed some questions related to their experiences in class with participation during the academic period, as well as an open-ended question so that they could disclose any additional information. This information can be used to further improve the system or as a basis for later research. A 5-level Likert scale, ranging from 1 -"completely disagree" to 5 -"completely agree" was used as a quantifier for all questions except the open-ended one. The questions included in the survey were:

1) I felt comfortable answering the questions that the teacher asked
2) The questions the teacher asked were very difficult
3) I studied more for this class compared to other classes
4) I paid attention to my classmates' answers
5) I felt an obligation to attend class so that I wouldn't lose my participation
6) The grade I received for my participations was fair
7) Open-ended question where students can write any concerns or comments

RESULTS

CLASS PARTICIPATION – THE APPLICATION

Class Participation has been used by Dr. Arias since 2014 as a helping tool for his courses at UNITEC Honduras. During a complete academic period (second semester of 2016), the participation of UNITEC students from the courses of Data Structures and Theory of Computing was monitored using Class Participation.
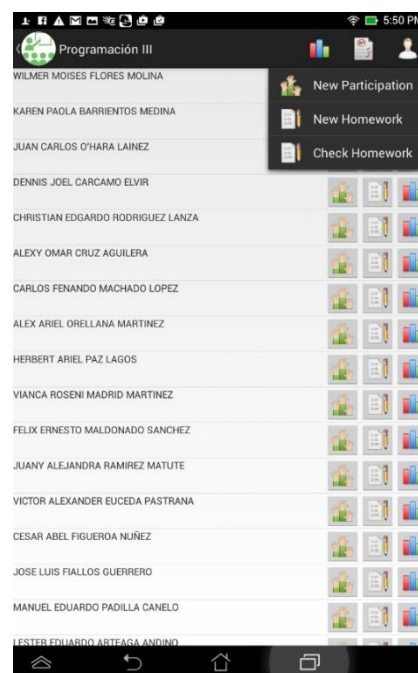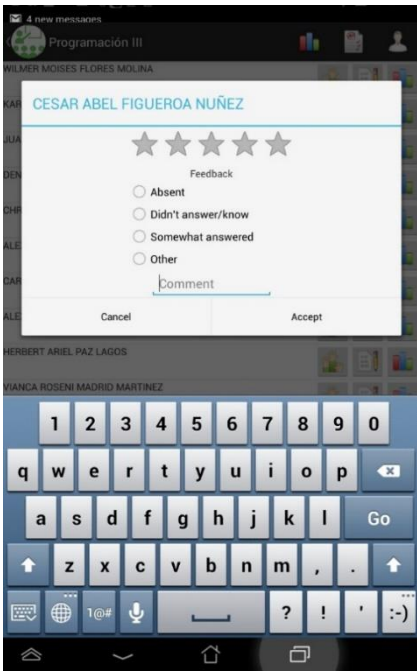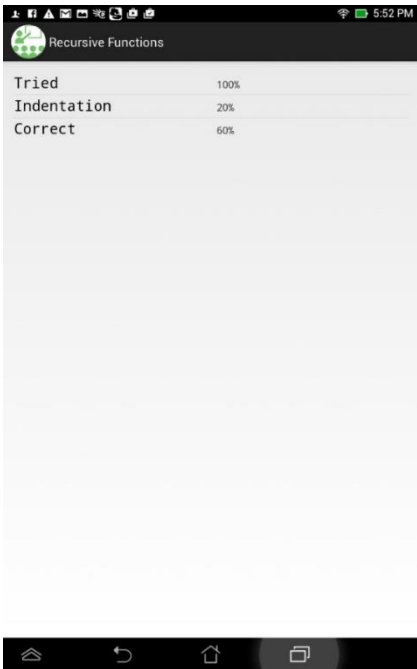

Picure 1. Class Participation main view

Picture 2. Class Participation grading view

There are several other features that enhance the teacher's ability to grade accurately. Class Participation also allows to define a homework or any other assignment, with its own grading system as well.

Picture 3. Sample homework grading view

There is also a historical record, where the teacher can see the performance of the students of previous academic periods, as well as those of any other courses that the teacher might be lecturing during the current academic period. All of this information is stored both locally and in an online database, where data can be synchronized from.
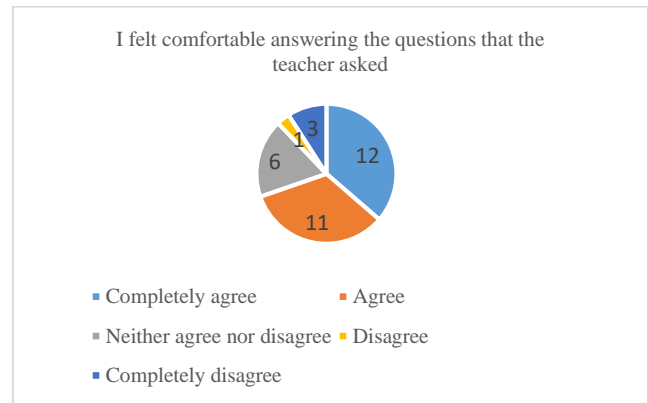
34 students were surveyed

Figure 1. "I felt comfortable answering the questions that the teacher asked"

The students report their comfort when answering the questions they were asked during the course length, with 66% of the surveyed students agreeing that they were comfortable. 12% of the students disagree about feeling comfortable with the questions asked. 18% neither agree nor disagree.
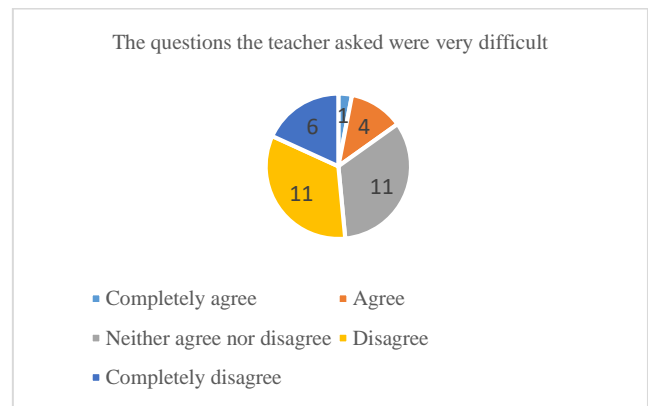

Figure 2. "The questions the teacher asked were very difficult"

The students report their perceived difficulty of the questions asked by the professor. 51% didn't perceive the questions as too difficult. 15% of the students agree that the questions were very difficult. 33% neither agree nor disagree.

Both data sets related to the questions asked during the course show that there was a reasonable level of student comfort during the academic period.
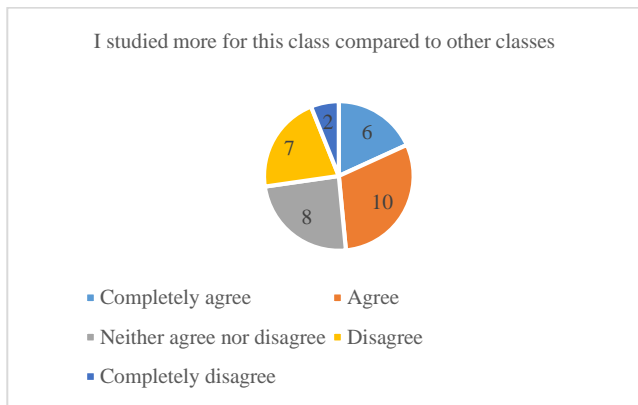
Figure 3. "I studied more for this class compared to other classes"

48% of the students agree that they studied more for the class where Class Participation was used in that academic period. 27% of them didn't study more for said class in comparison to their other classes. 24% of them neither agree nor disagree.

It has to be noted that this question doesn't take into account the academic workload that students might have had in other courses they were attending at the time. The variability of said workload might have influenced the distribution of their study time.
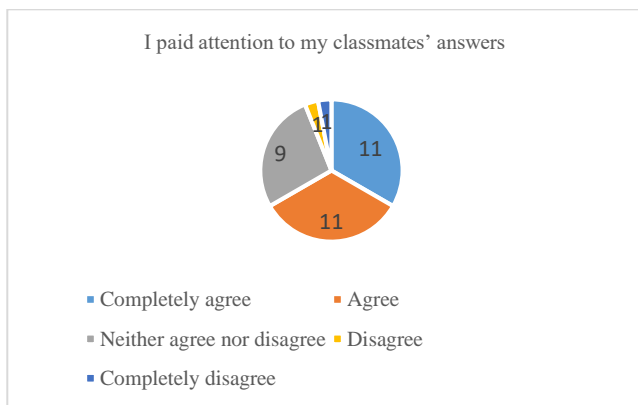

Figure 4. "I paid attention to my classmates' answers"

The students report whether they paid attention to their classmates' answers. 66% of them agree that they paid attention, while 6% disagree. 27% neither agree nor disagree.

This result shows that a significant portion of the students paid attention to what their classmates answered, with a small fraction of the students not paying attention.
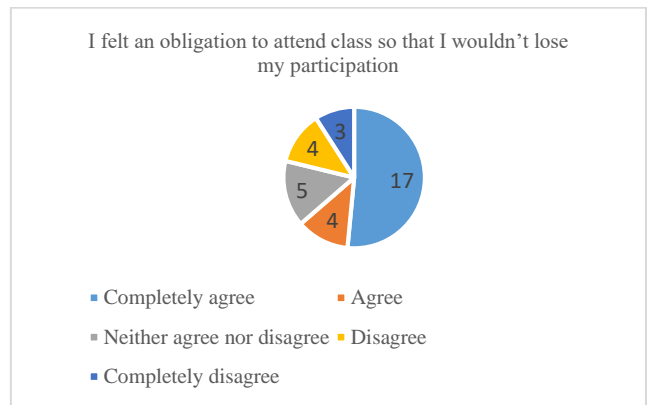

Figure 5. "I felt an obligation to attend class so that I wouldn't lose my participation"

64% of the students agree about feeling an obligation to attend class in order to participate. 21% disagree, and 15% neither agree nor disagree.
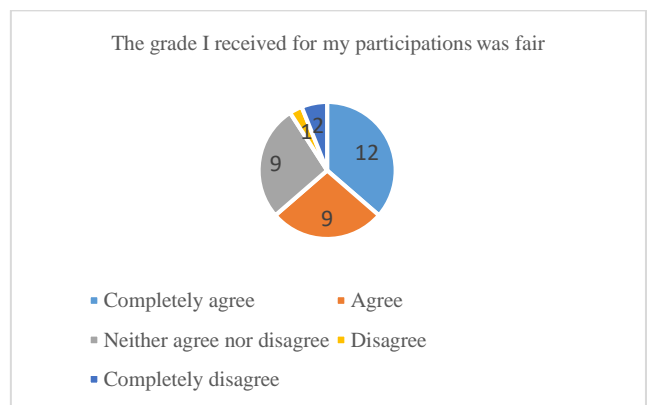

Figure 6. "The grade I received for my participations was fair"

63% of the students agree that the grade received for their participations was fair. 9% don't agree with the fairness of their grades, and 27% neither agree nor disagree.

CONCLUSIONS

An objective definition of participation was provided at the beginning of the academic period. The use of Class Participation was frequent, and students were aware of the grading system and its guidelines. Most of them perceived that the grades for their participations were fair, which shows their understanding of the definition of participation and grading that the teacher provided.

Class participations were encouraged and graded, which might have led to an increase in motivation. Students showed that they were comfortable when answering the questions, and they were paying attention to their classmates' answers.

An engagement in class attendance and participation was observed as well, though it may be argued that this was the result of a passive coercion. Since students were required to

participate in order to earn their course credit -and thus they were required not to skip class-, most of them might have felt an obligation to attend the lectures.

FUTURE RESEARCH

A Class Participation web portal has been planned. There, students will be able to see their own grades just as they appear in their teacher's mobile application. This portal will enable students to keep track of their performance during the academic period; it will also show information about previous courses that they took where the application was used.

ACKNOWLEDGMENT

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