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ABSTRACT

This study focuses on the progression of a prototype, named KlassBase, aimed at improving generally low student engagement and compensating for shortcomings of currently-employed engagement methods. The prototype is a smartphone application designed to incentivize honest, frequent sharing of feedback between students and professors, and provide insight into the areas of a course which need improvement. We tested our assumptions about which features of the prototype would positively impact engagement, first with interviews to refine our approach, then with online surveys to measure the performance of our prototype against one currently utilized method for enabling students to provide feedback -- traditional end-of-course evaluations. The results of the survey indicate that participants generally believed KlassBase would have a greater impact on a course's instruction, and more importantly, it would make them more engaged and active in the classroom.

Keywords

Student engagement, feedback, classroom, students, professors.

INTRODUCTION

Student engagement can be defined as "the tendency to be behaviorally, emotionally, and cognitively involved in academic activities" (Stephens, 2015). These types of engagement encompass factors such as students' effort, participation, and motivation, as well as emotional aspects such as interest, anxiety, and others (Davis et al., 2012). "Some educationists consider engaging disengaged pupils to be one of the biggest challenges facing educators, as between 25% (Willms, 2000). and over 66% (Cothran and Ennis, 2000) of students are considered to be disengaged." (Taylor and Parsons, 2011).

Not only is low student engagement a significant problem faced in education, but there are also deficiencies in the current methods employed by universities to support student engagement. The methods for engagement can be categorized into non-anonymous and anonymous.

Non-anonymous methods include face-to-face interactions, email, and traditional learning management systems implemented by universities. For instance, the Missouri University of Science and Technology (Missouri S&T) utilizes Canvas™, which offers the ability for students to engage with their professors and classmates via online discussion posts. The downsides of these non-anonymous methods are 1) they are incomplete solutions, as professors who utilize some or all of these methods still face challenges with incentivizing student participation and discussion, 2) they can negatively impact how comfortable students feel participating, and 3) they are not inherently accessible to other students. This means the majority of students in a class who were not involved in a non-anonymous interaction (e.g. an email exchange or in-person conversation between a single student and professor) may miss out on helpful explanations from the professor or other students.

The primary anonymous engagement method for students in the case of Missouri S&T, as well as other universities, is the end-of-course evaluation, which is a survey sent to students at the end of each semester to collect feedback about each of their classes and professors. A Missouri S&T survey (Missouri S&T Student Council, 2017) of over 400 students in 2017 found that nearly 90% of students indicated they generally fill out evaluations. However, less than half of students agreed that they feel their responses to evaluations are taken into consideration. Additionally, nearly 40% of students felt the evaluations take too long to complete.

To address the issues with student engagement and the tools traditionally used to promote and measure engagement, we developed a proof-of-concept application for simplifying and shortening the process for sharing class-related feedback with classmates and professors, and for supporting actionable insights from that feedback, with the ultimate goal of increasing student engagement.

KLASSBASE PROTOTYPE

Early in the prototyping process, we centered our the design of the KlassBase prototype around incentivizing the behavioral (i.e. participation) aspects of engagement. Asking and answering questions is a key component of participation both during and outside of class time, and therefore, our early prototype resembled a question-and-answer format. We hypothesized that if the prototype could incentivize students to feel more comfortable asking and answering more questions of their classmates and professors using an app outside of class, they would then be more engaged in the classroom. However, after conducting interviews with students and demonstrating the early prototype to them, we gained a few key insights that shifted our design approach:

- Anonymity -- one of the core features of our prototype which we assumed was critical to students' comfort with participation -- was not viewed by interviewees as highly important in the context of asking and answering questions. Some interviewees simply felt they did not need or want to ask questions during class.
- We believed a handful of features -- particularly, an "archive" of questions and answers posted during previous semesters, an "FAQ" page with answers to common questions, and the ability to "downvote" other students' posts -- would increase the value of the prototype and incentivize its usage. Those features were not well-understood by interviewees, as they were confused about how those features would work and how they would contribute value.
- Interviewees generally expressed they were more likely to utilize the resources already available to them for help with learning: friends, the professor, their textbooks, and the Internet.

From these insights, we decided to modify our approach to achieving the outcome of increasing student engagement. The features stated above (archive, FAQ page, and downvoting) were excluded from the final version of the prototype and the design focus shifted from incentivizing behavioral engagement, which is the traditional focus of teachers, to emotional and cognitive aspects of engagement. We also focused the key features more directly at addressing the issues with end-of-course evaluations and LMS discussion boards. For example, as supported by the Missouri S&T Student Council survey results, students perceive the evaluations' efficacy to be low and their completion time to be too long. Below, the design principles of our final prototype aimed at addressing those issues are listed:

- Reduce the effort required to share feedback with the class to incentivize students to form a habit of doing so
- Create an environment that encourages the honest exchange of feedback
- Reward students for sharing feedback by socially reinforcing the habit
- Reinforce the efficacy of sharing feedback and increase likelihood professor will read and act on feedback
- Incentivize the professor and students in a class to take action to improve student engagement

A number of core features were implemented into the final prototype to achieve the above design principles. These features were determined from the insights of the early interviews and analysis of the alternative engagement methods.

a) A "microsurvey," which students are reminded to fill out after each class period by a phone notification, requires students to rate the class period with "stars" and allows them to optionally provide open-ended feedback (which can be shared anonymously or using a pseudonym)

b) A "lounge" of students' posted feedback, which can be upvoted by other students if they share the same sentiment. Posts with many upvotes appear in the "daily report." Irrelevant or inappropriate posts can be reported and removed.

c) "Daily reports" to summarize feedback about a class period by displaying average ratings and top-upvoted posts.

d) A "class graph" to display average ratings over time of all measured indicators of student engagement and sentiment. The graph would enable the class to measure the impact of changes to the course on key indicators.
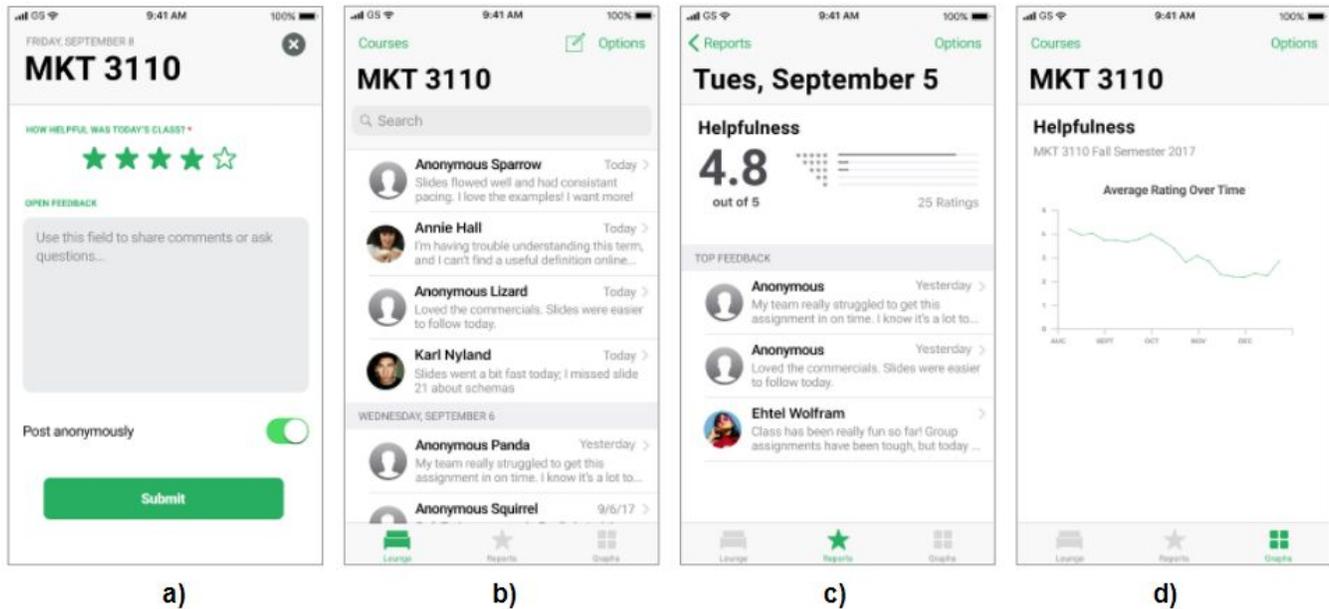

Figure 1. Selected Screens from the Final Prototype Design With Descriptions

We believed the notifications and short surveys, paired with optional anonymity, would incentivize students to share feedback about their class with their classmates and professor. Upvoting (or reporting), daily reports, and the class graph would, as we assumed, help the class improve both the quality and usefulness of the feedback, and especially students' perception of the efficacy of contributing feedback. In the next section, we will discuss the methods by which we tested the assumptions we incorporated into our final prototype design.

METHOD

To determine the effectiveness of our prototype, we performed a simple experiment that compared our KlassBase prototype to the current baseline, end-of-course evaluations. This experiment was designed to determine what effect each tool had on participants' in-class engagement and thoughts on the feedback loop for a given course. The results of this experiment would help us determine whether or not our prototype had the effect we hoped on these factors, especially in comparison to the tools already at each student's disposal.

Participants

Students (N = 77) from a Missouri university were asked to participate in our study. Many participants were asked to participate in our study in exchange for in-class extra credit. This helped grow our sample size, considering the length of our experiment, which deterred students from responding during early iterations of our prototype research. For this crossover

study, participants were divided into two groups, where Group A encountered the traditional end-of-course evaluation first and Group B encountered KlassBase first.

Experimental Task

Respondents were first asked a number of demographic questions, and then were queried on their present status concerning student engagement, as well as how professors utilize feedback. Then participants were given one of two scenarios: The first centered around end-of-course evaluations, and the second around the KlassBase prototype. In both cases, participants were asked to imagine themselves as a student having just exited a class for the day, and are presented with the given tool to provide feedback. After observing the tool and its features, participants were then queried on how they felt it would affect their in-class engagement and the class's feedback loop. When asked about KlassBase, respondents were also asked to rate the usefulness of a number of the prototype's features. Participants were then given the other scenario, depending on which one was first served. The experiment would then conclude.

Measures

Participants were asked multiple questions based around in-class engagement and the student-professor feedback loop, each utilizing a 5-point Likert scale. Questions between scenarios were near-identical, except for when referencing the name of each scenario's tool. Each scenario featured 16 questions on these topics. Participants were asked similar questions before viewing either scenario, in relation to their current status and feelings. In addition, participants also answered 15 questions concerning the usefulness of certain features of the KlassBase prototype, each on a 5-point "usefulness" scale. The survey was distributed online and participants could answer the questions on either a desktop/laptop computer or mobile device.

ANALYSIS/RESULTS

The preliminary questionnaire in our survey provided statements regarding factors that we believed would contribute to the success of our prototype in achieving increased student engagement. Participants were asked to rate how strongly they agreed or disagreed with these statements. The results of this questionnaire validated our assumptions about the importance of anonymity and what factors were necessary for people to use the app. We found that students are more likely to feel more comfortable sharing feedback with professors when they can be anonymous and may be inclined to share more detailed feedback more often. Our participants reported that they would feel more comfortable providing negative/critical feedback when they can be anonymous, but anonymity barely affected their decision to provide positive feedback or not. Participants reported that they would generally be more inclined to submit feedback to professors if the method was easy, quick, and convenient to do so. The absence of these factors may lead to higher bounce rates.

Average Rating	Statement
4.31	I feel more comfortable sharing feedback with professors when I can be anonymous.
3.82	I feel more comfortable sharing feedback (which can include questions) with classmates when I can be anonymous.
3.95	I share more feedback (which can also mean ask more questions) when I am anonymous.
3.86	I share more detailed/personal feedback/questions when I am anonymous.
3.13	I feel more comfortable providing positive feedback when I'm anonymous.
4.12	I feel more comfortable providing negative feedback when I'm anonymous.
3.92	I would prefer to share feedback (and/or ask questions) online while anonymous.

Table 3. Preliminary Questionnaire Results: Anonymity and Student Feedback on a 5-Point Scale

The results from our simple experiment indicate a number of key findings. Concerning intent to use, the students in our survey would prefer to leave feedback on the existing platform, End of Course Evaluations. Students may be more

comfortable, trusting, and confident in the current platform since it is the current implemented feedback system and they have already used this platform is a real classroom setting. However, participants reported that they see the direct benefit that KlassBase has to offer and generally believe that KlassBase would have a greater impact on a given course's current instruction and personally benefit the user more than End of Course Evaluations. Students also reported that using KlassBase makes them more engaged (+10.8%) and helps them be more active in the classroom (+18.6%) than the current alternative. Overall, the participants were 10.4% more satisfied with their experience using KlassBase than with their experience using End of Course Evaluations.

	Dependent Variable			
	Intent to Use Platform	**Perceived Immediate Benefit**	**Engagement in Class Using Platform**	**Active Interaction in Class Using Platform**
Platform: KlassBase	0.0292	0.7835***	0.3377*	0.5455**
	(0.1232)	(0.1653)	(0.1639)	(0.1627)
General Level of Engagement in Class	0.3254**	0.3813**	0.4409***	0.3203*
	(0.0975)	(0.1308)	(0.1297)	(0.1287)
General Level of Active Classroom Interaction	-0.1612	-0.1054	-0.1682	-0.1006
	(0.0929)	(0.1246)	(0.1235)	(0.1226)
Predisposition to Share Feedback With Classmates	0.1510	0.0234	0.0820	0.0566
	(0.0786)	(0.1054)	(0.1045)	(0.1037)
General Desire to Share Feedback With Professors More Often	0.1636*	0.0040	0.2235*	0.2158*
	(0.0722)	(0.0986)	(0.0960)	(0.0953)
Constant	1.9595***	1.4848**	1.0020*	1.0612*
	(0.3458)	(0.4639)	(0.4598)	(0.4564)

Note: $*p<0.05; **p<0.01; ***p<0.001$

Table 4. Research and Analysis Regression Model

Regressing the above dependent variables against the independent variables listed on the left of the table has provided some useful insights about the participants in our study and their behavior as it pertains to our prototype. It is important to note that while we altered the order that participants interacted with each platform between Group A and Group B, this did not have a statistically significant effect on any dependent variable. Participants' gender, general level of classroom interaction, and their predisposition to share feedback with classmates did not have a significant effect on our results.

There was a significantly positive effect on participants' perceived immediate benefit (such as a course instructor taking feedback into account and altering his or her instruction content or methods as a result), engagement in class, and active interaction in class using KlassBase as opposed to End of Course Evaluations. Participants' reported engagement using KlassBase increased by 6.8% and their reported active classroom interaction increased by 11% in the perceived scenario. Participants' general level of classroom engagement had a significantly positive effect on each dependent variable and their general desire to share their feedback with their professors more often had a significantly positive effect on their intent to use KlassBase, their engagement in class using KlassBase, and their active classroom interaction using KlassBase.

DISCUSSION

The Klassbase prototype currently focuses on providing a quick, easy, and convenient experience for students who wish to anonymously provide frequent feedback to their professors. Our research helped specify some intensely important aspects of

our design, which play a major role in accomplishing our student engagement goals. Respondents indicated the importance of anonymous responses, along with the simple and quick submission of microsurveys. This, alongside notification frequency, are make-or-break features that will either draw in potential users or shut out others. Striking a balance between the length of the surveys and the frequency of application notifications is key towards maximizing user interest; If surveys take too long to fill out, or notifications are received too often, those surveyed would likely find the app much less useful. As such, these features play a key role in making our prototype desirable among students, while simultaneously increasing student engagement. The research is loud and clear- including anonymity and reminding users to participate in short, small microsurveys boasts greater results than other learning management systems that don't sport these features.

For future research on our prototype, we hope to improve on many aspects of our design. Our current prototype lacks much interactivity, such as the ability for participants to submit their own feedback; Those surveyed also utilized a desktop computer, rather than a smartphone. These factors may diminish the realism of the scenario and skew the responses. Therefore, it would be beneficial to further test and develop the prototype into a functioning smartphone application that enables students to interact with it how it was intended to be used.

Participants were also asked to imagine themselves within a scenario, and determine how they feel a tool could change the way they participate in a class. While this data is invaluable, it only gauges how a participant expects they would react, not how they would actually respond in a classroom setting. Future experiments will involve having students within a specific course use our prototype, and seeing how the results differ in a real-life scenario rather than an imagined one. A fully functional app that could be used in classes over an entire semester would allow us to glean deeper insights into how behavioral student engagement is affected and to receive rich qualitative feedback about the app in action. From there, we can refine the features of KlassBase to better encourage consistent feedback for classes and to promote student engagement.

REFERENCES

Cothran, D. J., & Ennis, C. D. (2000). Building bridges to student engagement: Communicating respect and care for students in urban high schools. Journal of Research and Development in Education, 33(4), 106-117.

Davis, Heather A., et al. "What Does It Mean For Students to Be Engaged?" An Interpersonal Approach to Classroom Management: Strategies for Improving Student Engagement, Corwin, 2012, pp. 21–33.

"Learning Management System | LMS | Canvas by Instructure." Canvas LMS, Instructure, www.canvaslms.com/.

Missouri S&T Student Council. "Student Academic and Advising Survey." 2017.

Stephens, Tammy L. "Encouraging Positive Student Engagement and Motivation: Tips for Teachers." *Pearson Blog*, Pearson Education, 21 Aug. 2015

Taylor, L. & Parsons, J. (2011). Improving Student Engagement. Current Issues in Education, 14(1). Retrieved from http://cie.asu.edu/

Willms, J. D. (2003). Student Engagement at School: A Sense of Belonging and Participation. Results from PISA 2000. Paris: Organization for Economic Co-operation and Development (OECD). Retrieved from http://www.unb.ca/crisp/pdf/0306.pdf