

## EVALUATION OF AN ONLINE STUDENT RESPONSE SYSTEM

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### Abstract

The objective of this study was to assess an online student response system. I have previously used hardware-based student response systems (SRS). Consistent with the literature, I had found them to be effective in enhancing classroom engagement. However, also consistent with the literature, I found that hardware-based SRS presented occasional technological problems and to be slow to set up. I postulated that an online SRS system might enhance the classroom environment but not pose the technological issues experienced with hardware-based systems. I used an online SRS system in two marketing classes. Indeed, students reported that the use of the online SRS enhanced their learning and enjoyment of the class. Survey results indicated that they verbally participated at an increased level versus previous classes and that they preferred the online SRS to the hardware-based system. The students and I found that the online SRS posed much fewer technological issues and took less time to set up.

### Introduction

The socio-constructivist approach to learning supports the view that students learn through social interaction; listening, questioning, answering, discussing, etc. (Hickey, 1997). Through cognitive processes, they “construct” an understanding of the material covered in a given course. Hence, the instructor’s role is to provide the opportunity for the students to become an “active learners,” fully engaged in the classroom and learning process.

As a supporter of this pedagogical approach, it was with some excitement that I first tried a hardware-based student response system (SRS) approximately four years ago. I believed that the use of SRS would increase student engagement. First introduced in the mid-1980’s, hardware-based student response systems have also been referred to as remote response systems, clickers, group response systems, electronic response systems, and personal response systems.

It appears that SRS have established a strong foothold in higher education. The company, Audience Response Systems, refers to themselves as the original supplier of SRS and advertises that they have a rental “fleet” of 10,000 keypads available ([www.audienceresponse.com](http://www.audienceresponse.com)). They appear to be targeting the corporate events market. Another supplier, Turning Point, discusses their commitment to higher education on their website and claims to have 2,300 U.S. colleges and universities using their system with six million units sold ([www.turningtechnologies.com](http://www.turningtechnologies.com)). Similarly, iclicker states that their systems are in use in 1,300 higher education institutions ([www1.iclicker.com](http://www1.iclicker.com)).

My experience with a hardware-based SRS generally mirrors the results that researchers have reported in the literature. My course evaluations indicated that students enjoyed answering the SRS questions and seeing how the class responded overall. These positive comments are consistent with the findings of Carnaghan (2007), Hoffman (2006), Keogh (2009), Permursoso (2011), and Presby (2006) all of whom reported positive assessments of SRS.

Both my students and I experienced frustrations with the hardware-based SRS “clicker” technology. The clicker system took time to set up in each class. Students sometimes had technical issues in getting their clickers to work. Also, students were very frustrated with the cost of the clickers. They purchased them at the beginning of the semester with assurances from the bookstore that they would be able to return them at the end of the semester.

Unfortunately, the bookstore had an oversupply of used clickers at the end of the semester and refused to accept any additional units.

Cunningham (2008) reported that students complained that the clickers did not always work and you could not participate if you forgot your clicker. Keogh (2009) stated that it took 8-12 minutes to get each clicker to work and that cost was a negative factor. Ghosh (2009) suggested that faculty needed to share SRS questions in order to lower the “time investment” for new faculty wishing to get started with SRS.

While I was pleased with the enhanced student engagement that the use of SRS brought, I was frustrated with the technical and cost issues associated with the hardware-based system I was using. Hence, it was with great interest that I recently learned about online SRS.

### **Online Student Response Systems**

In recent years, online SRS have emerged as an alternative to hardware-based SRS. They provide similar capabilities as hardware-based systems, but as the name implies do not require dedicated hardware or clickers. Instead, students can respond to poll questions via their computers, laptops, tablets computers, or smartphones.

### **Evaluation of an Online Student Response System**

With the belief that online student response systems might address the technical challenges of hardware-based SRS while still providing enhanced class enjoyment and learning, I decided to conduct an evaluation. I used the “Top Hat” system.

### **Method**

#### **Top Hat: An Online SRS System**

When used in the university setting, Top Hat is an online system that allows students to vote in polls presented by the professor. In preparation, the professor sets up an online Top Hat account and each student in class also registers with Top Hat online. Professors create questions on their Top Hat account. When ready to use in the classroom, the professor is able to retrieve the questions from his/her Top Hat account and display them for the class. Students can vote by using the Top Hat “app” that they have downloaded to their smartphone, tablet computer, or laptop.

There is no charge to universities for the use of Top Hat. Students pay \$20 per semester or \$38 for a five-year subscription. Free accounts are available for classes under 30 students; institutional pricing is also available.

Top Hat’s corporate website claims that their system is in use at 350 universities around the world (<https://tophat.com>).

#### **In Which Classes was Top Hat Used?**

Top Hat was employed in two classes at a large public university:

- Undergraduate introductory marketing class (100 students)
- Undergraduate market research class (40 students)

Top Hat questions were used in approximately 75% of the classes over the course of the semester.

#### **Pedagogically, How was Top Hat Used?**

As a new topic was introduced, I would present a series of three to four questions on Top Hat. Students were then given a few moments to respond. Summary results were immediately and anonymously displayed.

For example, at the outset of discussion on retailing, the following question was presented via Top Hat:

Excluding groceries and restaurants, what percentage of your purchases is done online?

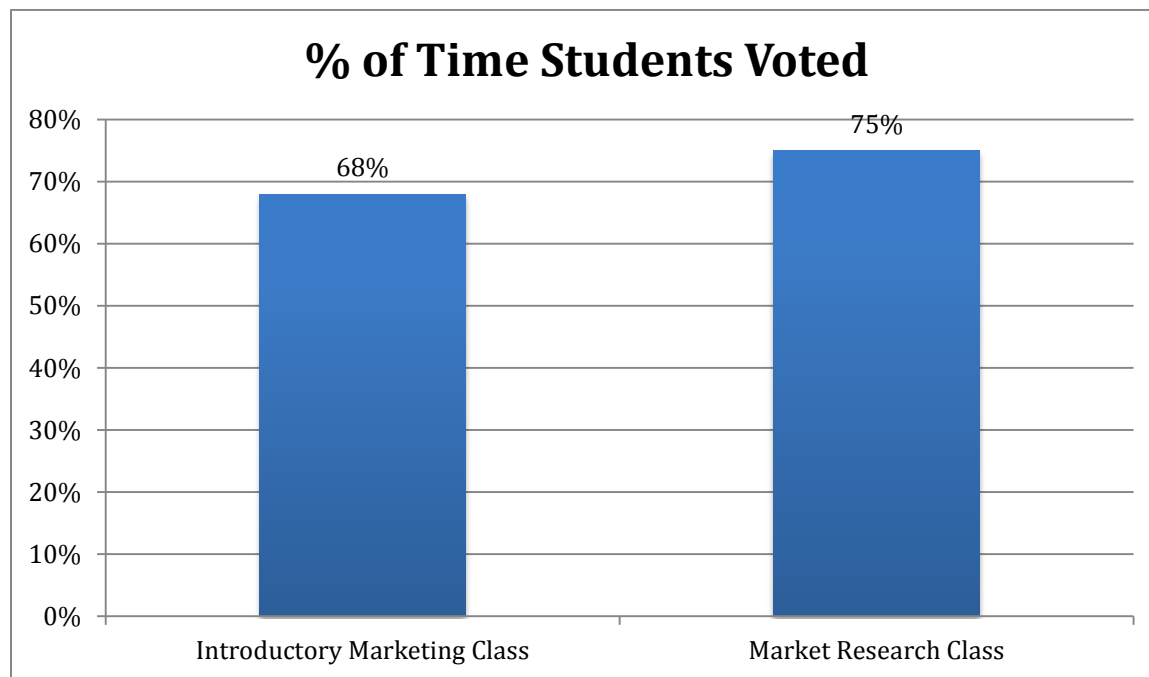
- a) 0-20%
- b) 21-40%
- c) 41-60%
- d) 61-80%
- e) 81-100%

The survey results served as a springboard for discussion of online shopping and retailing in general.

## Results

### Did Students Actually Use Top Hat?

Yes, the use of Top Hat was required and virtually all students registered. Of the opportunities available to respond, 68% of the students in the introductory marketing class (100 students) and 75% of the students in the market research class (40 students) participated in Top Hat polls.

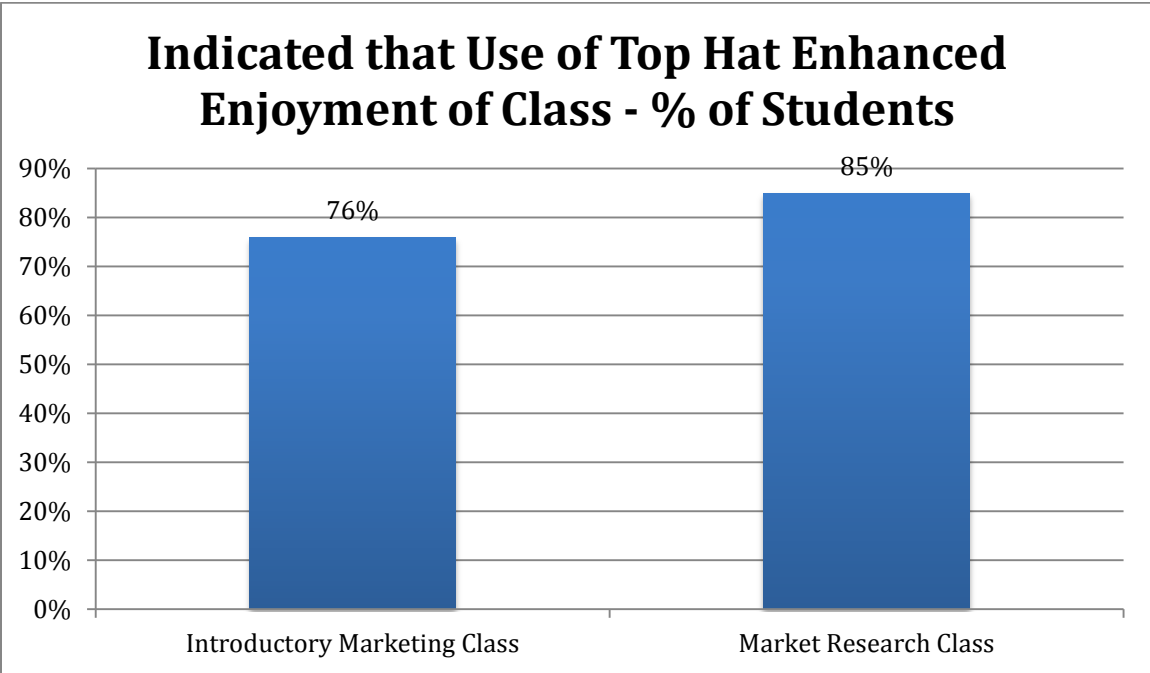


**Figure 1:** % of Time Students Voted

Toward the end of the course students were asked to complete a survey regarding their use of Top Hat. Key results follow.

### Did Top Hat Enhance Student Enjoyment of the Class?

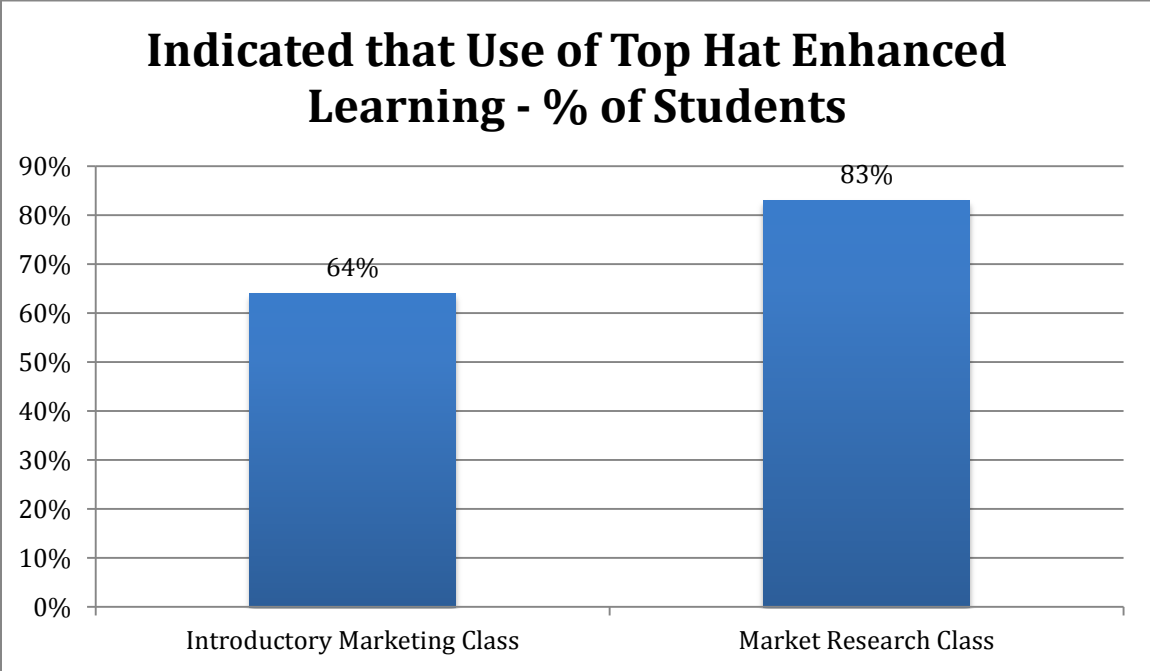
Yes. The percentage of students agreeing that Top Hat enhanced their enjoyment of the class in a positive way is shown below.



**Figure 2:** Indicated that Use of Top Hat Enhanced Enjoyment of Class - % of Students

**Did Top Hat Enhance Student Learning?**

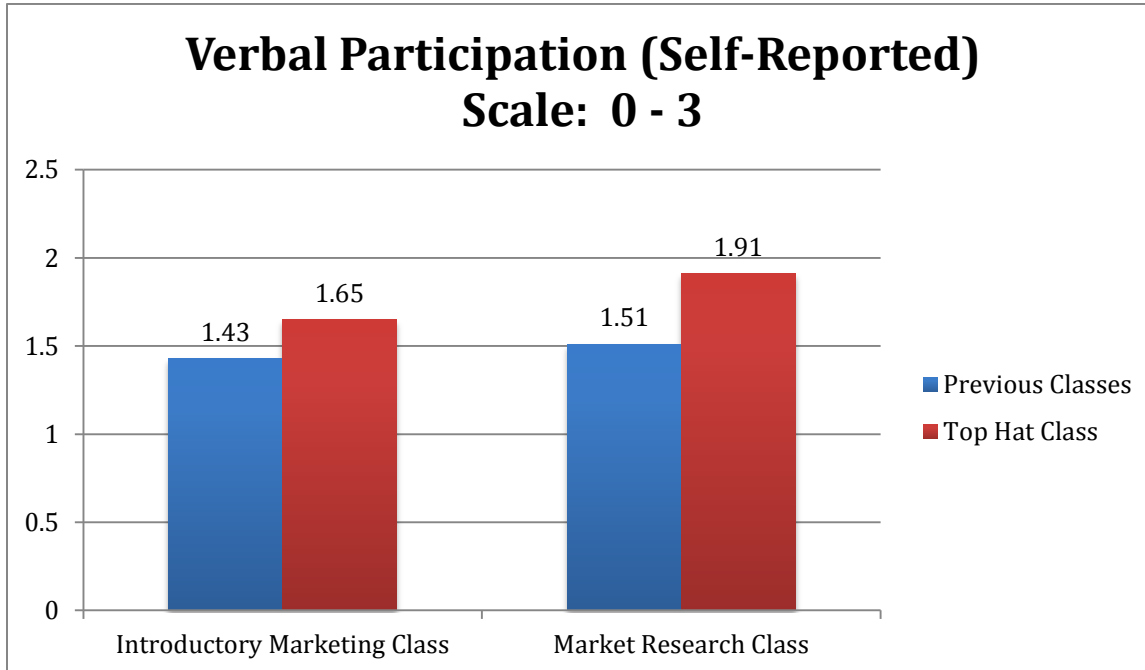
Yes. The percentage of students agreeing that Top Hat enhanced their learning experience in the class in a positive way is shown below.



**Figure 3:** Indicated that Use of Top Hat Enhanced Learning - % of Students

## Did the use of Top Hat Increase Verbal Participation in the Class?

Yes. The average level of participation increased in both Top Hat classes versus previous classes (self-reported by students).



**Figure 4:** Verbal Participation (Self-Reported)

Students were asked to rate their level of participation in previous classes and in the current marketing class on a four-point scale from 0 (no participation) to 3 (multiple comments in virtually every class). For both classes, the mean participation increased in the Top Hat marketing class versus previous classes.

**Table 1:** Average Participation

Class	Average participation for previous classes	Average participation for current Top Hat class	Difference in Means	Difference in Means (%)
Introductory marketing class	1.43	1.65	0.22 <sup>4</sup>	+15.3%
Market research class	1.51	1.91	0.4 <sup>5</sup>	+26.5%

## In What Ways did Top Hat Facilitate Verbal Participation?

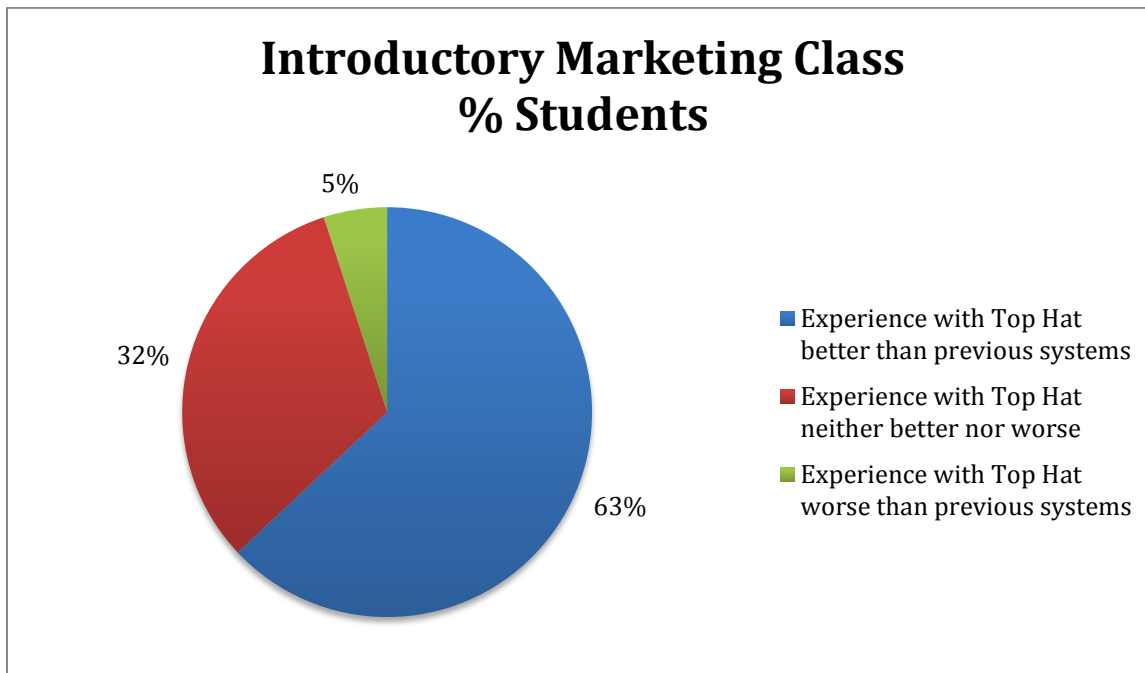
<sup>4</sup> Significant at 95% confidence level

<sup>5</sup> Significant at 95% confidence level

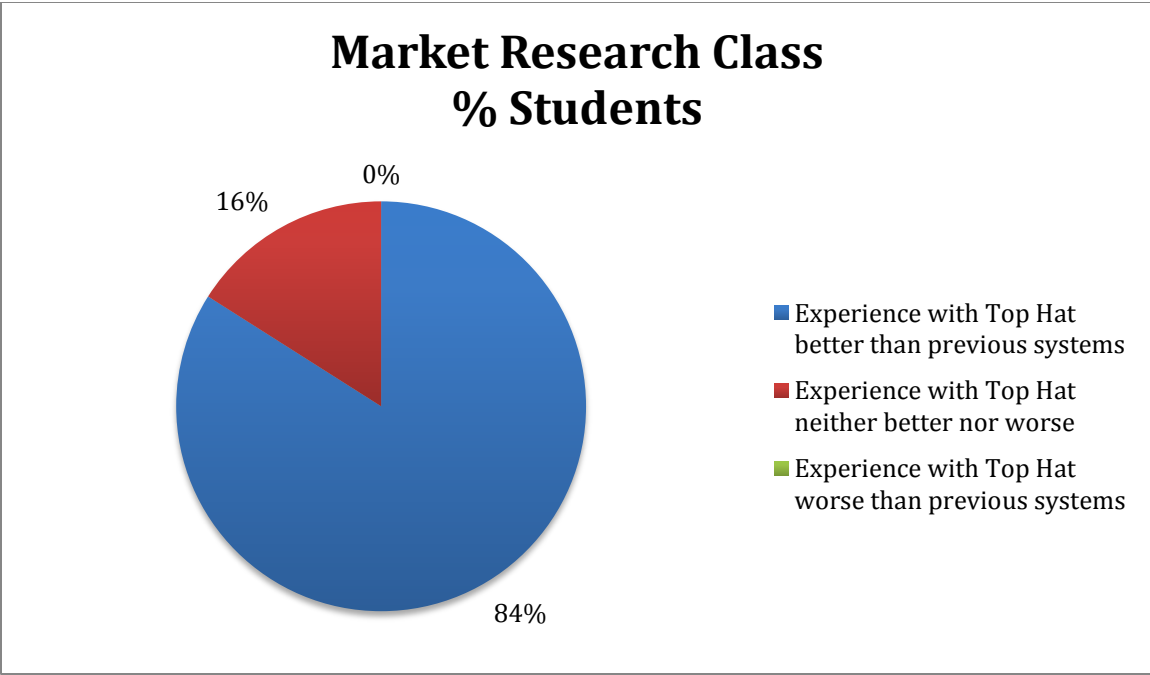
For those students who indicated that Top Hat had a positive impact on their verbal participation, we asked them to indicate why and in what ways. Representative quotes follow:

- Top Hat added something to talk about. It becomes a focal point that can start a discussion.
- It had a positive impact, I think for the whole class. Saved time and made it easier for everyone to be part of the discussion at once as a whole.
- It made me feel more involved especially in such a large class.
- Top Hat motivated me to discuss my answers to the questions being asked because it makes you want to give your opinion.
- It is interesting to see the results of the questions with actual percentages. It helps spark class discussions on the results from the class.
- I am a shy person and I hardly speak. But by using Top Hat, made me more interested in the subjects.
- It had a positive impact on my level of participation by allowing me to interact with the class.
- It showed me that some students were thinking the same things so it made me not afraid to speak my mind.
- It was a very engaging and erased the fear of answering a question wrong in class. It also showed that if you got the wrong answer you were not the only person.
- Top Hat had a positive impact on my level of participation because I got to see what other students were thinking of (and it is good to know I had similar answers to classmates).

How did students view Top Hat relative to other student engagement systems? Students were then asked if they had experience using other student response systems such as iClicker. Approximately half of the students in each class had. Those with previous experience were asked to comment on their experience with Top Hat versus previous systems. Results follow.



**Figure 5:** Introductory Marketing Class - % Students



**Figure 6:** Market Research Class - % Students

Students with previous experience with student engagement systems were asked to comment on the ways in which they felt Top Hat was better or worse. Representative comments follow:

- It (Top Hat) was simpler and visually more organized. Little to no training required to use it.
- It was better as I didn't have to purchase a clicker or bring it to class.
- Accurate, quick, fun. Able to track what you answered and display your results instantly. No clicker necessary. Able to access from the phone app.
- It is mobile friendly and easy to use.
- Top Hat was better because it is online and very reliable. The iClicker would have problems and was a waste of money.
- The iClicker sometimes lagged and was not always very responsive as Top Hat. Overall better tool for class discussions.
- Top Hat was better than iClicker. Sometimes the iClicker wasn't responsive. Top Hat had no errors all semester.
- iClickers are expensive clunky, slow and inefficient. Top Hat is easy to use, and relevant. iClickers cost \$50+ and are only used 3 times per semester. iClickers are not worth it at all. If Top Hat requires students to pay anything over \$20, it is not worth it.
- Better because responses are immediate and anonymous. It is nice that it has a mobile app for your phones so the purchase of a clicker is not necessary if a computer is not present. It encourages class discussion. My previous response system was slow and inaccurate. I was never sure if my responses were being received. Top Hat allows you to view your responses and see if you were correct or not.

**Discussion**

Based on this assessment in two classes, the use of Top Hat, an online SRS, does appear to have enhanced the enjoyment and learning the class. Students, on average, reported that they participated more in these two Top Hat classes than was the case for previous classes they had taken. Their qualitative comments indicated that students appreciated the opportunity to see, through Top Hat, that their views and thoughts were consistent with the rest of the class. This in

turn, gave them the confidence to raise their hands and participate verbally in class. These overall findings are, in general, consistent with previous research. From a technological perspective, among students who had used both hardware-based SRS and Top Hat, a significant majority preferred Top Hat. They mentioned the system's simplicity, lack of hardware, ease-of-use, and cost as advantages over hardware-based systems. From my point-of-view as an instructor, I found the Top Hat system to be extremely easy to use and set up. I too appreciated the fact that there was no external hardware for me to remember to take to class. When I did have questions, I found the technical support at Top Hat to be helpful and available. I look forward to continued use of online SRS.

References Available upon Request