

# Do Clickers Depersonalize the Classroom? An Evaluation by Shy Students

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## Abstract

The benefits of interactive teaching aids like the Personal Response System (PRS) have been widely heralded. This study examined whether the PRS would increase learning as measured by quiz scores and be liked more by shy and female students. Using the PRS resulted in significantly higher quiz scores than when not using the PRS. Shy compared to non shy students more strongly agreed that the PRS both depersonalized the course and did not allow adequate expression of their opinions in the class. No gender differences were found. The situation-specific nature of shyness was proposed to explain the findings.



The effectiveness of the Personal Response System (PRS) has been widely studied. Brewer (2004) found that educational tools such as the PRS and a web-based system improved student attitudes as well as increased the amount of study time outside the classroom. Blackman, Dooley, Kuchinski, and Chapman (2002), also noted a difference in test scores using the interactive teaching tool. Interactive teaching aims to revolutionize the traditional lecture format of teaching, which neither requires nor elicits active participation. The benefits of these interactive educational tools are further discussed in self-reports by educators who have used them (Steele, 1998; Community College Week, 2000; McQuin, 2004).

Because the PRS and other equivalent systems have been shown to be extremely beneficial in the general classroom setting, it seems reasonable to assume that the PRS would be especially effective with and preferred by those students who are less inclined to speak up and participate in class discussions. These students fall into two main categories: the shy student (Lacinda-Gifford, 2001) and the female student (Gilligan, 1993).

This study evaluates the effectiveness of the PRS system in an introductory psychology course in a college classroom. The hypotheses of this study are: a) The average quiz score over material covered while utilizing the PRS will be higher than the average quiz score over material covered using a traditional lecture approach. b) There will be more positive ratings for the PRS from shy students than non shy students. c) Female students will have more positive ratings of the PRS than male students.

## Method

### Participants

Participants were 78 students (27 men, 51 women) from an introductory psychology course in a small, private college in Northern California. The reported ethnicities were broken down as follows: 43 Caucasians, 17 Asians, 3 African Americans, 8 Hispanics, 6 other, and one who declined to respond.

### Materials

Materials included independently generated quizzes from two chapters in a general psychology course. Additionally, a survey was used to assess the students' attitudes towards the PRS, as well as their gender, ethnicity, class standing, total hours of recreational computer use each day, and total hours spent each week preparing for the class. Students' shyness scores were measured using the revised Cheek and Buss Shyness Scale (RCBSS).

### Procedure

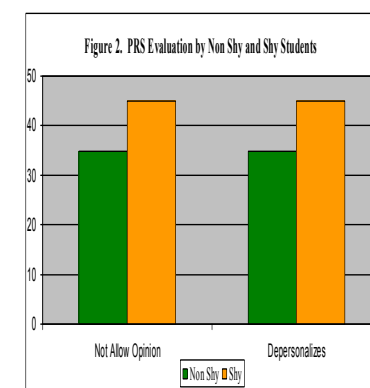
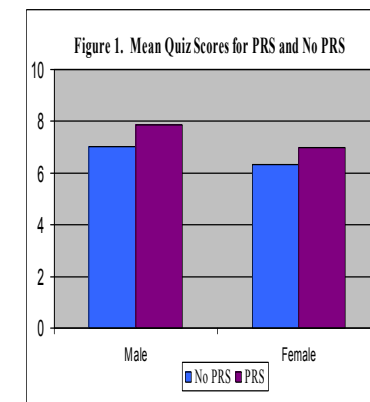
The timeline involved covering the chapter material prior to the quiz. Two chapters from a general psychology textbook were selected because of their equivalent difficulty based on the mean quiz scores obtained from these chapters during the previous quarter. In the no PRS condition, traditional lectures and class activities occurred prior to the quiz. In the PRS condition, the instructor used the PRS during lectures to: 1) survey the class on attitudes about the class topic in order to stimulate discussion, and 2) check comprehension of concepts through a few practice quiz items presented throughout each class period. After the material was covered, the students were given a quiz. Students were then given the option to participate in the study by filling out the PRS attitude survey and the RCBSS for extra credit. In order to maintain anonymity and encourage honesty, students signed and detached the consent form from their surveys before returning them. In this way, we were unable to ascertain how the shy students' quiz scores were affected by the PRS.

## Results

Using a split-plot analysis of variance, the average quiz score over material covered using the PRS ( $M = 7.4$ ,  $SD = 1.8$ ) was found to be significantly higher than the average quiz score over material covered with no PRS ( $M = 6.7$ ,  $SD = 1.9$ ),  $F(1) = 12.41$ ,  $p = .001$ , thus supporting the first hypothesis. Further analyses revealed a between-subjects effect for gender with the mean quiz score for men of 7.44 ( $SD = .26$ ) significantly higher than the mean quiz score of 6.64 for women ( $SD = .27$ ),  $F(1) = 4.57$ ,  $p = .04$ . However, there was no significant interaction effect between condition (PRS, no PRS) and gender. See Figure 1.

Multiple items were used to assess student attitudes about the PRS. Students reported that the PRS contributed to their learning through their increased attention, participation and direct feedback. Using the Mann-Whitney U test, results revealed that shy students ( $n = 36$ ) were more likely than non shy students ( $n = 42$ ) to feel that the PRS did not allow them to express their opinions in class,  $z = -2.008$ ,  $p = 0.045$ . Additionally, shy students were more likely than non shy students to believe that the PRS depersonalized them,  $z = -2.005$ ,  $p = 0.045$ . Both of these results are depicted in Figure 2. The third hypothesis that female students will have more positive ratings of the PRS than male students was not supported.

Shy students ( $n = 36$ ) were more likely to use the computer for recreational use than non shy students ( $n = 42$ )  $z = -2.375$ ,  $p = 0.018$ . There was a significant correlation between shyness scores and internet usage,  $r(78) = .30$ ,  $p = 0.008$ .



## Discussion

Using the PRS to supplement the traditional lecture format appears to benefit student learning as measured by higher quiz scores. Today's technologically savvy generation may feel disconnected and alienated in the traditional lecture hall. The PRS may provide a bridge for these students into the traditional classroom.

Use of the PRS was not more beneficial for women than men nor for any specific ethnic group with respect to quiz scores. A future study should measure the frequency and speed at which men and women respond to questions in a classroom competitive game setting. In this way, one could compare the number of responses with the PRS to a traditional approach and detangle the question of whether women are benefiting more from the PRS than men through increased participation. Because both men and women are benefiting from the PRS, this technology in the classroom is a promising tool that can be used to eradicate sexism in the classroom. The PRS allows all students, regardless of age, gender, or ethnicity to respond equally to questions raised in class. Immediate feedback is given to all students both through the automated response charts, and through teacher feedback. The teacher is blind to which students clicked which response, so one source of gender bias is removed.

Contrary to our hypothesis, shy more than non shy students feel that the PRS does not allow them to express their opinions and depersonalizes the classroom. Although clickers allow everyone to actively participate, shy students may feel that they are being deprived of a setting in which they regularly receive social stimulation through listening to others speak up in class. Since shy students outdistance non shy students in their use of the internet for recreational purposes, they may have a larger need and greater expectation for social stimulation in the live classroom. Hence their need for social stimulation may be such that they are more likely to feel that the clickers are depersonalizing and limiting expressions of opinions. In other words, the shy student's need for personal contact may be situation specific.

Although results indicate that all students benefit when the PRS is used in the classroom, clearly shy students have some strong negative attitudes about its efficacy for them. Future research needs to compare quiz scores of shy and non shy students under both the PRS and no PRS conditions. Until then, we cannot determine whether the PRS helped shy students do better on their quizzes than non shy students. Without this information, one should be hesitant to recommend the PRS as a panacea for all students.

