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Reflections at Hand: Using Student Response Technology to Mediate Teacher Reflection

In Dewey's (1933, 1938) writings, he claims that the ability to reflect is initiated only after a problem is recognized and its uncertainty is accepted. The dissonance created by realizing that a problem exists engages the reflective thinker to actively critique current conclusions and generate new hypotheses. In addition, "reflective thinking requires continual evaluation of beliefs, assumptions, and hypotheses against existing data, and against other plausible interpretations of the data" (Larrivee, 2000, p. 294). For teachers reflecting on student learning, the 'existing data' are student responses to questions. Several studies have reported that teachers utilize student responses to modify instruction. In one case study examining computer mediated feedback, researchers found that the instructor altered her instruction by providing more examples and explanations based on the feedback she received from her students (VanDeGrift, Wolfman, Yasuhara, & Anderson, 2000). Burnstein and Lederman (2001) found that response technology indicated how well the students understood the material presented and enabled teachers to fine tune their teaching effort to the students' level of comprehension. Yet teachers have overwhelming demands placed on their time. Added responsibilities and administrative duties steal time away from their academic preparation and instruction. Consequently, teachers lack the time to pause and reflect on their instruction.

One technological tool, Student Response Systems (SRS), may be the catalyst for dissonance described in Dewey's process of reflection and provide the necessary data teachers need to reflect on their instruction and student progress. SRS technology provides a means for teachers to reflect on student progress and reflect on their capabilities as a teacher instantly. This technology combines wireless remote control devices and software to create interaction between the teacher and students in the classroom. It has several capabilities which enable teachers to monitor student understanding by allowing teachers to create multiple-choice questions related to curriculum topics and embed them into their lecture. Once all students have selected an answer, a histogram displays an itemization of the students' answers. The display offers the opportunity for students to see the correct answer and anonymous responses of other students while giving the teacher the opportunity to explain why one answer is correct and the others incorrect. Moreover, this display offers the teacher immediate information on her students' understanding. This comprehensive data source provides instantaneous formative feedback on which she can reflect about her instruction and make necessary changes.

Student Response Systems

Student response systems are classified by a variety of names in the educational and product literature. Various names found over the years include: classroom communication system (Abrahamson, 1999; Beatty, 2004; Dufresne, et al., 1996), computerized response system (Garg, 1975), electronic response system (Bessler & Nisbet, 1971), electronic voting system (Draper & Brown, 2004), and student response system (Littauer, 1972). SRS are also referred to informally as response pads, keypads, or more commonly as "clickers".

Early student response systems were initially developed to help instructors evaluate student comprehension of presented content in large lecture classes (Bessler & Nisbet, 1971; Garg, 1975; Littauer, 1972). Early systems electronically received student responses to teacher questions and displayed the combined results (Beatty, 2004). These systems were hard-wired devices attached to students' desks with wires running to a central location where the instructor could view the responses. The hard-wired systems consisted of mounted knobs, buttons, or telephone key pads that communicated through wires running to a series of voltmeter gauges attached to the instructor's podium indicating the number of students responding to each choice (Judson & Sawada, 2002). Draper (2005) describes a one-button response system used in large lecture courses in the late 1940's in Holland and Belgium as one of the first known electronic response systems. However, Abrahamson (2006) claims the first systems were used at Stanford University in 1966 and at Cornell University in 1968. Regardless of when the first systems were used, the information available on the early systems is limited. The Cornell system was designed and built by Littauer (1972) and he is the first instructor to report positive classroom experiences from response system use.

Current student response systems technology has evolved into more portable handheld remotes with software capable of many advanced functions. Although the physical appearance of SRS has changed, the goal is still to support communication and interaction in the classroom. This technology allows a teacher to present a question or problem to the class; allows students to enter their answers into a remote device; and instantly aggregates and summarizes students' answers for the teacher and for the class (Beatty, 2004). Today's response system equips each student with a wireless, handheld electronic device that communicates with a receiver/computer in the front of the room.

The Classroom Performance System (CPS), created by eInstruction was the response system investigated in the present study. Since the release of CPS in 2000, over three million response pads are being used in all 50 states and in 10 foreign countries worldwide in thousands of k-12 schools, over 600 universities, and business institutions (http://www.einstruction.com). CPS provides a tool for teachers to engage all students in the classroom at any point in the instructional process through teacher questioning. Immediate real-time feedback is provided by SRS to both the teacher and students in the classroom.

In multiple studies, teachers reported satisfaction from using student response systems. Burnstein and Lederman (2001) found that the technology clearly differentiated easy and difficult topics, and students' comprehension of the material. A one button system used at New

Mexico State University provided students with the option of pressing the button when they did not understand lecture content. All buttons were wired to a meter at the instructor's podium indicating how many students were pressing the button and their collective level of understanding of particular topics presented in the lecture (Draper, 2005). Burnstein and Lederman (2001) found that SRS dramatically increased interactions between the teacher and students describing the remotes as "a powerful learning tool for the instructor".

Teacher Reflection: Steering the Ship's Course

Rhodes (1988) equates the effective teacher to a ship's captain who must repeatedly make small adjustments to the ship's course in order to reach the desired destination. Each of these small corrections is based on prior experience and knowledge about what could lie ahead. Such reflective practice is required for adapting to new circumstances when there are no obvious solutions and for life-long personal and professional learning (Aukes, Geertsma, Cohen-Schotanus, Zwierstra, & Slaets , 2007).

In *The Reflective Practitioner* (1983), Schön first mentioned the notion of reflection as a component of professional practice. Schön offered two types of reflection: reflection-on-action and reflection-in-action. Reflection-on-action is reflection on practice and on one's actions and thoughts undertaken after the practice is completed; whereas, reflection-in-action involves simultaneous awareness and reflection on one's actions and thoughts in the midst of action (Schön, 1983). Further, reflection informs one's actions and creates the opportunity to build new understanding. Specifically, Schön (1983) describes it this way:

> The practitioner allows himself to experience…confusion in a situation which he finds uncertain or unique. He reflects on the phenomenon before him, and on prior understandings…. He carries out an experiment which serves to generate both a new understanding of the phenomenon and a change in the situation (p. 68).

The value of reflective practice has gained in currency. When teachers become reflective practitioners, they "move beyond a set of basic skills to a place where they integrate and modify skills to fit specific contexts, and eventually, are able to invent new strategies" (Larrivee, 2000, p.294). Reflective teachers do not merely seek solutions, nor do they do things the same way every day without an awareness of the impact of their actions. By developing self-reflection, teachers become more cognizant of the dynamic responses between teachers and students (Larrivee, 2000). These interactions become the necessary external feedback that prompts reflection, the opportunity for new understanding, and instructional modification.

This external feedback serves as a type of formative assessment. In contrast to summative assessments, which include comprehensive assessments at the end of instruction for the purpose of verifying mastery or grade assignment, formative assessments are ongoing, repetitive measures that provide information to the teacher to meet individual needs of students (Boston, 2002). Formative assessment provides a means for the teacher to monitor learner progress, to identify students' errors in understanding, and to provide useful feedback concerning the effectiveness of instructional activities. Indeed, the on-going, collaborative use of formative assessment as a reflective tool to improve teaching and learning has been found to be a powerful motivator for reflective change (Ash, Tucker, Austin, Ferguson, Kraft, & Heller, 1999). Boston (2002) found that when teachers know how students are progressing and where they are having trouble, they can use this information to make necessary instructional adjustments, such as re-teaching, trying alternative instructional approaches, or offering more opportunities for practice, thus leading to improved student success.

Student Response Systems, a Tool to Elicit Formative Feedback and Promote Reflective Practice

According to early SRS users, "better teaching" was the goal from the beginning (Abrahamson, 2006; Bessler & Nisbet, 1971; Garg, 1975; Littauer, 1972). While this goal has yet to be substantially supported in research, the use of a student response system has the potential of meeting this goal (Abrahamson, 2006). It is common for a teacher to ask "a question that the majority of students do not understand" (Abrahamson, 2006). Abrahamson points out, however, that after one has "summon[ed] up one's best elucidation of the point in question, ask[ed] another question, and find[s] the majority *still* do not understand," she/he is prone to reflect on teaching, thus, "motivating the seeking of better pedagogical content knowledge" (p. 11). Concurring with Abrahamson, Beatty (2004) found when a student response system is first used, "instructors are shocked by how incorrect their expectations are of students' comprehension" (p.5).

Early SRS developers also designed the systems to help address participation and learning issues in large lecture-based classrooms. School class size continues to be an issue in both public education and university settings. Burnstein and Lederman (2001) felt that introductory lecture courses were highly ineffective due to class size. To attempt to increase participation and learning of students in a university lecture class, the investigators included "how am I doing questions" throughout the lecture. Students responded with choices from 'very clear, no questions'; 'I have a question or two'; 'I have a lot of questions'; and 'I am so confused, I don't have any questions'. It was found that these questions interspersed in the lecture allowed the instructor to stop and extend, repeat, or modify the lecture to meet the students' needs. The investigators claim that the use of the keypad response system dramatically changed the typical one-way interaction between teacher and student in a short time and was a powerful learning tool for the instructor (Burnstein & Lederman, 2001). Boston (2002) claims that when teachers know how students are progressing and where they are having trouble, they can use this information to make necessary instructional adjustments, such as re-teaching, trying alternative instructional approaches, or offering more opportunities for practice; thereby leading to improved student success.

In an earlier yet related study, Garg (1975) explained his use of an electronic response system to allow students to overtly inform the instructor on the pace of instruction. Specifically, students were able to repeatedly input selections such as “go faster” or “go slower” during the instructor’s lecture. As Brown (1972) illustrates, students are able to control the “conveyor belt of knowledge” with electronic response systems. Instructors are able to pace the lecture according to student responses by moving faster or stopping to clarify, redefine, and explain. Ultimately, the consequence of formative feedback afforded by response systems gets back to the original goal of SRS technology: Better teaching.

The Relationship between Reflective Practice and SRS Use

While some SRS researchers have inadvertently found reflection as a reported benefit, none of the studies was theoretically grounded within the constructs of reflection and SRS use. The purpose of this study was to examine the correlation between teachers’ existing self-reflective practices and their use of student response systems. In other words, is SRS associated with self-reflection, a practice which influences a teacher’s instruction? Using the metaphor of teacher as ship’s captain, does SRS data facilitate changing the steerage of the ship’s course?

The following research questions were addressed in this study:

Question 1. What is the relationship between teachers’ reflective practice and their use of student response systems?

Question 2. To what extent does use of SRS predict self-reflection?

Question 3. To what extent do teachers differ on self-reflection and SRS use based on grade level and level of experience?

Method

Population and Sampling

Teachers from elementary, middle, and secondary public schools (N=481) in southeastern US were recruited to participate in this correlational research study. Schools were selected based on willingness to participate, access to student response system technology, and convenience to the researcher. Two hundred fourteen participants (44% return rate) completed online the *Teachers' Technology Use and Belief Survey* (TTUBS) instrument containing questions on self-efficacy beliefs, self-reflection practices, openness to change, and personal use of student response systems. Only the data related to self-reflection and SRS use are presented here.

Instrument Development

The *Teachers' Technology Use and Belief Survey* (TTUBS) instrument was developed from an existing reflection instrument and with additional questions constructed by the researchers. The instrument included background demographic information about the participant related to education levels, teaching experience, and current teaching placement. The instrument also included questions related to the availability of student response systems and typical use. These questions were constructed for the purpose of gathering the necessary information on how often and in what capacity student response systems are used in the classroom. Participants were asked questions in yes/no, open-ended, and forced choice formats.

The reflection items were drawn from the Groningen Reflection Ability Scale (GRAS) developed by Aukes, et al. (2007). The GRAS was developed to measure personal reflection in medical practice and medical education. The original scale contained 23 items on a 5-point Likert scale ranging from 'totally disagree' to 'totally agree' and was worded for medical students. The developers of the instrument reported an internal consistency reliability of a Cronbach's alpha coefficient of 0.83 (2007, p.180). According to the standards for educational and psychological testing (American Educational Research Association et al., 1999), the GRAS can be regarded as 'good' for less important decisions at the individual level (0.70 ~ 0.80). For this study, the researcher selected 14 applicable items and revised the wording to apply to classroom teachers and their instruction.

Instrument Reliability

The overall reliability for the entire TTUBS instrument is 0.90. The reliability for the self-reflection sub-scale was 0.84. The reliability reported in this study was slightly higher than previously reported reliabilities of 0.83 (Aukes, et al., 2007). There were five SRS items with one of these items divided into seven parts for the analysis. The reliability for SRS use was 0.91. This is a high reliability score for the SRS items constructed for this study and not found in other studies.

Data Collection

Research approval was obtained from district leaders and principals in participating schools. An invitation letter that explained the research study, detailed participant rights, and contained an internet link to access the survey online was presented via email to 461 teachers and presented to 20 teachers in person. A total of 216 teachers responded to the survey. Two surveys were incomplete and removed resulting in 214 teachers in the study, which yields a 44% response rate. Hamilton (2005) claims that the average response rate for online surveys for a sample under 1000 is 41.21%. The 44% response rate in this study is viewed as an acceptable rate since it exceeds Hamilton's expectation for online survey participation.

Characteristics of Survey Respondents

Gender and Race. Table 1 displays aggregated respondent characteristics and reveals that the responding sample was comprised of 21 males (9.81%) and 193 females (90.19%). This rate is lower than the demographics in the school districts as a whole. Although the male research participants in this study are underrepresented as compared to district totals, females still largely dominate public school classrooms and that is shown here. Surveys were received from one American Indian, four African-Americans, and 209 White teachers. In one of the school districts, African-American teachers account for less than 2% of all teachers. In another school district, African-American teachers account for about 7% of the teacher population (2006

State Report Cards). While the responding sample is predominately white, it resembles the racial composition of the school districts represented in this study.

Table 1

Demographic Data of Sample

Demographic	N	Percent
Gender		
Male	21	9.81
Female	193	90.19
Race		
American Indian	1	.47
African-American/Black	4	1.87
White	209	97.66
Highest Degree		
B.A.	27	12.62
B.S.	82	38.32
M.Ed.	87	40.65
Ed.S.	10	4.67
Ed.D.	1	.47
Other	7	3.27
National Board Certified		
Yes	36	17.14
No	174	82.86
Experience Level		
Beginning	30	14.08
Intermediate	67	31.46
Advanced	116	54.46
Grade Level		
Elementary	87	41.83
Middle	84	40.38
High	37	17.79

Experience Level. Teachers were divided into three groups. A code of ‘beginning’ was assigned to teachers with 3 or fewer years of experience (14.08%). Teachers with 4 to 10 years of experience were coded as ‘intermediate’ (31.46%). Majority of responding teachers (54.4%) self-reported more than 10 years of experience and was coded as ‘advanced’.

Data Analysis

The data were imported into the statistical analysis software package SAS. Items were reversed, as needed, so all variables were one-dimensional. Descriptive statistics were calculated for each item and factor. Frequency distributions were used to create a profile of the responding sample. Means and standard deviations were generated from the self-reflection items. The Pearson product moment correlation was computed to explain relationships between the variables. Both the magnitude and the direction of the relationship were determined. Simple linear regression analysis was used to describe how the mean of a response variable changes according to the value of the explanatory variable. This bivariate model was used to individually predict self-reflection from SRS usage.

Research Question 1: What is the relationship between teachers' reflective practice and their use of student response systems?

Self-reflection and SRS use show a significant low correlation at .38 (p<.01).

Research Question 2: To what extent does use of SRS predict self- reflection?

The R^2 for the linear model was .14, indicating the proportion of variance in self-reflection explained by the predictor variable. Fourteen percent of the variation in self-reflection can be explained by the use of SRS technology. The P-value for this variable is significant (p<.001). SRS use does affect self-reflection, as displayed in Table 2. Specifically, for a one-unit increase in SRS use, there is an expected increase in self-reflection by .40 points.

Table 2

Linear Regression Analysis Predicting Self-Reflection

Variable	R^2	β	*P*
SRS Use	0.14	0.40	.00

Note. F = 14.80, df = 89

Research Question 3: To what extent do teachers differ on self-reflection and SRS use based on grade level and level of experience?

As shown in Table 3, the means and standard deviations for individual scale scores based on grade level revealed high school teachers had the lowest score for all variables investigated.

Table 3

TTUBS Scale Scores by Grade Level and Experience Level

	Self-Reflection		SRS Use	
Demographic	M	SD	M	SD
Grade Level				
Elementary	77.90	5.23	8.60	4.76
Middle	78.20	6.83	10.16	6.39
High	75.92	6.16	4.00	2.35
Experience Level				
Beginning	75.64	5.79	10.73	7.16
Intermediate	77.97	5.98	9.65	5.39
Advanced	77.82	6.21	7.88	5.33

Middle school teachers had the highest self-reflection score and SRS use score. In order to determine if the groups were significantly different, t-tests were performed. A pooled sample method was used for the variances of the variables that were statistically equivalent; however, the Satterthwaite method was used for unequivalent variances. (*Note*: The Satterthwaite method is used to adjust the variances and determine significance when the null of the equal variances test is rejected in a t-test.) High school teachers were found to be significantly lower on SRS use when compared to elementary school teachers (p=.0002) and middle school teachers (p<.0001). In terms of level of experience, intermediate teachers, four to ten years of experience, had the highest self-reflection score. Beginning teachers, three or fewer years of experience, had the highest SRS use score. In order to determine if the groups were significantly different, t -tests were performed. All of the variances of these variables were statistically equivalent; therefore the pooled sample method was used. The results showed one significant difference in the groups. Comparisons were not significant.

Discussion

Research question one focused on self-reflective practice and SRS use. Self-reflection and SRS use have a low yet significant correlation. The researchers expected much higher association with these two variables, for SRS use has been shown in multiple studies to aid in formative assessment, presenting data to teachers that enable them to reflect on their existing practices, and ultimately make changes for the better (Abrahamson, 2006; Boston, 2002; Burnstein & Lederman, 2001). It is possible that while the relationship between self-reflection and SRS use is logical, it has not yet been put into practice in the classroom. Perhaps the teachers in this sample do not use the technology enough to have an impact on self-reflection.

The second research question examined SRS use as a predictor of reflective practice. It is not surprising that an increase in SRS predicts an increase in self-reflection. The very nature of SRS technology is one that promotes reflection and formative assessment. While the construct of self-reflection has not been overtly studied with SRS technology, findings from previous studies elude to the benefits of SRS technology to self-reflection. The self-reflection finding in this study is consistent with findings from previous researchers who claim that the use of keypad response systems dramatically changes the typical one way interaction between teacher and student in a short time and is a powerful learning tool for the instructor (Burnstein & Lederman, 2001; VanDeGrift et al., 2000). Reflection-in-action described by Schön is cyclical in nature where teachers try new things, build theories about what worked and what did not, and then take that new knowledge into the next experience (1983). SRS technology potentially could speed up this cycle by providing instant feedback allowing teachers to reflect more quickly and more often on their instruction. The convenience of the aggregated student responses by SRS technology provides teachers with the necessary data to be more reflective.

The final research question investigated the grade level and level of teaching experience relative to SRS use. The findings in this study show SRS use the highest in middle school classrooms. It is not surprising that middle school teachers have the highest use of SRS systems. Middle school students will enjoy the novelty of a classroom remote system. Also, the issue of anonymity is vitally important for middle school students who begin to engage in social comparisons and want to avoid looking bad in front of their peers. During the course of this study, some elementary school teachers, primarily kindergarten teachers, expressed that SRS technology was not appropriate for their age group. This could explain this finding. Equipment issues could be a reason high school teachers do not use SRS technology as much as others. And, advanced concepts in high school subjects requiring special characters in math and science could hinder the use for some teachers.

With regard to level of experience, the data indicate that beginning teachers have the highest SRS use score. This is consistent with findings that beginning teachers tend to integrate technology more into daily instruction (NEA, 2008). This could be a result of the push for technology integration into instruction by university teacher preparation programs or the push from principals hiring new graduates with the expectation of technology integration. Also, the majority of beginning teachers are *millennial.* These individuals are defined as being born during the middle 1980's, and who have grown up using technology in their everyday lives (U.S. Department of Education, 2004).

It is interesting that intermediate teachers had the highest self-reflection score. For this study, intermediate teachers had between 4 and 10 years of teaching experience. It is possible that intermediate teachers are comfortable with everyday teaching practices and routines and have more cognitive resources to expend on learning new things. Additionally, it is possible that teachers at this stage are approaching burn out and are looking for new ways to add interest to their teaching. Intermediate teachers perhaps have not become set in their ways and are willing to learn from themselves and their students through self-reflection. Berliner's research (1989) on expert and novice teachers claims that teachers are not able to reflect until around year five of teaching. Although they may have the skills earlier, they are much slower at using them. In addition, Berliner claims that expert teachers rarely reflect when things are going smoothly because they are capable of making decisions effortlessly and without much thought (1989).

Some Considerations: SRS Availability, Training, and Use

A relevant issue for this study is SRS availability. This study purposefully sought out schools with SRS technology available to the teachers. Yet a majority of teachers at each of the schools surveyed were unaware of the available technology, likely due to a lack of detailed communications by school officials concerning equipment availability and usage, or a hoarding of the available systems. The majority of classroom teachers in this study do not have a system permanently in their classroom and are forced to share a number of systems with all teachers. It is possible that a few technology superstars may hoard the systems for their own personal use reducing the availability to other teachers. Teachers also reported a lack of awareness of checkout procedures in their school, possibly the result of the lack of communication about availability of the systems and/or written operational procedures.

Another important concern relates to SRS training. This study, like many other studies on technology, shares the finding that more training is needed on technological tools (NEA, 2008). Many of the respondents indicated no knowledge of how to use SRS technology. The technology is available to them; however, they do not know how to use it. Learning how to use a new technology requires hands-on opportunities for teachers to interact with the system, make preparations for use, and simply “play around” with the technology in a structured training environment with available help from a qualified instructor. The National Education Association’s report on technology epitomizes the results found in this study. Although teachers receive mandated training, they do not feel adequately prepared to integrate technology into their instruction (NEA, 2008).

A limitation of this study is that data were gathered exclusively through teacher self-report. Research in which self-report is used can be problematic because it is easy and tempting for participants to supply answers that sound better than what actually is truthful (Miller, 1998). Another limitation is with generalizability of the results. This study involved school districts in southeastern United States and the responding sample was predominantly white and female; therefore, the data in this study can only be generalized to similar school districts and demographics. Teachers in other regions may provide different answers simply because of the structure of their schools, evaluation procedures, and the availability of technology.

Implications for Practice in Schools

Research has suggested that reflection is at the heart of educational practice (Black 2002; Sweeney, 1998). A reoccurring theme in the data was the value of self-reflection. In this study, an increase in self-reflection showed an expected increase in SRS use. Another finding represented by the data revealed that intermediate teachers had the highest self-reflection score indicating a need for self-reflection development among beginning and advanced teachers. Of these teachers, middle school teachers had the highest self-reflection score and high school teachers had the lowest score. Therefore, the data suggest a need for self-reflection development opportunities for teachers, especially beginning and advanced elementary and high school teachers. Self-reflection should be used as a tool for professional growth. Specifically, Dewey (1916) encourages teachers to be thoughtful and alert learners growing through reflection.

Reflection is improved when teachers practice it within a supportive community (Pedro, 2005). Schön (1996) suggested that reflective practice involves thoughtfully considering one's own experiences in applying knowledge to practice while being coached by professionals in the discipline. Active participation with a mentor provides opportunities to collaborate and engage in reflective dialogue. Administration should provide mentors to teachers and promote a reflective and collaborative school environment.

Additionally, this study found that with increased SRS use, an expected increase in self-reflection occurs. SRS technology provides the necessary data for teachers to reflect on their teaching; however, teachers may not use the technology on their own. Therefore, teachers should be paired with a technology mentor to model implementation and help in the integration process. These technology leaders should have advanced knowledge, skill, and experience with SRS technology and provide ongoing, collaborative, technical and instructional support (Glazer & Hannafin, 2008). Through the process of mentoring, teachers are encouraged to use these technological teaching tools to reflect on their current classroom practices and make positive adjustments. Findings of this study should encourage school administrators to increase reflection opportunities by providing mentors and SRS technology. Administrators, however, must be cautioned that providing SRS technology is not enough. To use one last time the metaphor of teacher as ship's captain, effectively steering her students toward achieving a deeper level of understanding, requires adequate time, availability and training in order for the technology to be effective in enhancing teacher reflection.

Future Research

The connection of SRS use and self-reflection is a valuable finding and needs more study. It is the researchers' contention that the self-reflection opportunities afforded by SRS technology are the greatest benefit of using the technology. While the findings were only minimal in this study, there is real promise in the relationship between self-reflection and SRS use. Future studies need to address teachers' use of all forms of self-reflection as compared to self-reflection initiated by SRS technology measuring the differences and benefits of technology mediated reflection. A study investigating how reflective practice is developed and sustained throughout the teaching career would be of particular interest in determining potential stages of reflection. In addition, research evaluating the changes teachers make to their instruction related to their reflective practice and the feedback received through SRS technology would provide further information regarding the connection between reflection and SRS technology.

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