Proposal: How To Effectively Integrate SRS in the Elementary Classroom Using The SRS Lesson Plan Template

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Abstract: This study examined how ten elementary teachers responded to an online instructional module on how to effectively integrate Student Response Systems (SRS) in the elementary classroom using the SRS Lesson Plan Template. The teachers all completed an online demographic survey, pre test, embedded test, post test, and attitudinal survey. Quantitative data was collected through criterion-referenced tests, which included the pre, embedded, and post test, which measured participants knowledge before, during, and after the Lesson Plan implementation. Qualitative data was collected using a demographic and attitudinal survey. The quantitative data collected revealed that participants did meet majority of the modules objectives and scores did improve in post test. The qualitative data revealed that most teachers generally feel more comfortable with SRS and agree that it is a valuable tool to use in the elementary classroom environment to engage students to be active participants in their learning.

Introduction

Digital natives are children who were born after 1980 and raised in a digital world. Digital natives are born into a world of digital communication technologies whereas digital immigrants adapted to the Internet (Palfrey & Gasser, 2008). In a sense, many of today’s K-12 students are digital natives and their teachers are digital immigrants. In schools that do not use technology to keep students engaged, motivated, and actively learning, the dilemma for digital natives is that they are avid digital multitaskers and are accustomed to technological devices as an integral part of their daily lives. Over the past four decades, educators have recognized the value of using technology in the classroom and since then have made many attempts to provide 21st century learning opportunities for their students (Fouts, 2000). To increase student and teacher interaction, as well as engagement and active learning strategies, this instructional
design project will incorporate a technology called Student Response Systems (SRS). The purpose of this study is to explore whether teachers can create a lesson plan using the Interactive SRS Lesson Plan Template. Specifically, the intent of the module is to demonstrate the benefits of using SRS and encourage teachers to implement SRS into their daily routines. Upon completion of this module, the researcher believes teachers will acquire the necessary skills to create lesson plans that incorporate best practices and pedagogical strategies when using SRS. An instructional design project is necessary to address the growing need to integrate technology effectively in the elementary classroom.

**Background**

SRS are an interactive technology that allows for ongoing formative assessments by enabling the teacher to pose questions and receive student answers immediately, which can then be displayed electronically for students to self assess (Johnson & McLeod, 2004). This technology provides the students with anonymity, speed of response collection, and the ability to share visual representations that help enhance recognition (Roshelle, 2003). According to research findings, SRS has a significant impact on student motivation and engagement (Hall, Collier, Thomas, & Hilgers, 2005). On the other hand, the subset of research available on the role of K-12 classroom SRS effects is relatively small, but at the same time very valuable.

SRS is only a technological tool that cannot function on its own. “Ultimately, … the pedagogical practices of the instructor, not the incorporation of the technology [is] key to student comprehension” (Judson & Sawada, 2002, p. 167). These pedagogical practices include the way the instructor views the class, the way the instructor designs the curriculum, and the questions that are developed to immerse the students in higher level
thinking (Beatty, 2004). When SRS are used in conjunction with effective questioning, discussion, and feedback—the technology “constitutes a powerful catalyst for conceptual change, heightened student engagement in class, and, because involvement and feedback for all students is equal” (Penuel, Boscardin, Masyn, & Crawford, 2007, p. 316). Researchers conclude that once students submit their answers through SRS, they become emotionally invested in the problem and are more inclined to pay deeper attention to the successive lecture (Beatty, 2004). Students like using SRS because it promotes active learning in large-class environments (Greer & Heaney, 2005). When SRS is integrated with effective peer-instruction strategies and best pedagogical strategies, students become more involved in the learning processes and have a sense of personal ownership over their contribution to the class (Beatty, 2004). Research on SRS in educational environments reveal a lot of potential on improving classroom learning. Although much research remains to be done to explicate why SRS are effective tools in the classroom, SRS does appear to enhance learning by creating an active learning environment, increasing participation, and increasing student enjoyment (Caldwell, 2007).

**Project Description**

Again, the purpose of this module is to explore whether teachers can create a lesson plan using the Interactive SRS Lesson Plan Template. Specifically, the intent of the module is to demonstrate the benefits of using SRS and encourage teachers to implement SRS into their daily routines. The ADDIE model and Gagne’s Nine Events of Instruction will be utilized to create the instruction. These frameworks will be described in the Methodology section of this proposal. The module will be delivered through a
QuickTime presentation, which will initially be created using Keynote presentation software.

The module aims to teach elementary teachers how to use the technological device, SRS. Teachers will learn how to implement SRS by completing the interactive lesson plan template, which includes developing questions to immerse the students in higher-level thinking and fostering student collaboration.

Design Methodology

Intervention

The five-phase instructional design model known generally as ADDIE will be used as a framework to design the module. The ADDIE model developed by Dick and Carey is a systematic instructional design model consisting of five phases: (1) Analysis, (2) Design, (3) Development, (4) Implementation, and (5) Evaluation. To address the conditions of learning, Gagne’s Nine Events of Instruction will be used to frame the evaluation.

The module will be designed based on a pre-developed instructional hierarchy. The instructional hierarchy identifies the necessary skills, which are presented in a logical order to accomplish the terminal objective. Each of the performance objectives are sequenced in an order that builds upon previous skills. Learners must be able to accomplish all skills in this particular order to move on to the next performance objective, and ultimately to reach the terminal objectives. For example, learners will need to recall prior knowledge to complete a performance objective that meets specific criteria. Additionally, learners will need to possess knowledge of the different components of a lesson plan in order to create a lesson plan.
Objectives will be sequenced and clustered into manageable chapters that are arranged by topic and related content to best facilitate the transfer of knowledge.

Performance objectives will be organized into three clusters, each of which includes a chapter focusing on a main component of the lesson plan. The fourth cluster will be a culminating activity for learners to create a lesson plan using the Interactive SRS Lesson Plan Template, which incorporates all the performance objectives. Each chapter will be given an estimated time frame for the learners to pace themselves throughout the module.

<table>
<thead>
<tr>
<th>Cluster 1</th>
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<tbody>
<tr>
<td>Entry Level 1</td>
<td>Recall specific assessment strategies</td>
</tr>
<tr>
<td>Entry Level 2</td>
<td>Define formative assessment</td>
</tr>
<tr>
<td>Entry Level 3</td>
<td>Define performance objectives</td>
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<tr>
<th>Cluster 2</th>
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<tbody>
<tr>
<td>Performance objective 1</td>
<td>Define SRS technology</td>
</tr>
<tr>
<td>Performance objective 2</td>
<td>Define backward design</td>
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<tr>
<td>Performance objective 3</td>
<td>Define questioning model</td>
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<tr>
<td>Performance objective 4</td>
<td>Define active learning strategies</td>
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<tr>
<th>Cluster 3</th>
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<tbody>
<tr>
<td>Performance objective 5</td>
<td>Identify Interactive SRS Lesson Plan Template</td>
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<tr>
<td>Performance objective 6</td>
<td>Demonstrate knowledge of backward design</td>
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<tr>
<td>Performance objective 7</td>
<td>Demonstrate knowledge of questioning model</td>
</tr>
<tr>
<td>Performance objective 8</td>
<td>Demonstrate knowledge of active learning strategies</td>
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<tr>
<th>Cluster 4</th>
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<tbody>
<tr>
<td>Performance objective 9</td>
<td>The learner will create an interactive lesson plan using the Interactive SRS Lesson Plan Template</td>
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*Figure 1. Performance Objective Sequence*
This instructional module is designed for elementary teachers who want to incorporate a new technology into their classroom. Their motivation is likely to foster and provide meaningful 21st century learning opportunities for their students. Any teacher who understands the need to integrate technology into the classroom, as an integral part of students’ daily routines, will benefit from this instructional module. These teachers are aware that technology should not just be an “add on” and proper pedagogical strategies must be used when technology is implemented to be effective and meaningful. The module is not biased to any specific subject matter, as it may be applied across various curricula, nor is it designed for teachers with a certain level of technology.
expertise. This module can be used by any teacher, whether a classroom, resource, or special education teacher. Additionally, these teachers may want to try a more innovative method for engaging and motivating their students to be active participants. Perhaps they feel a need to provide more learning experiences that incorporates more student and teacher interaction. Furthermore, these teachers may want to incorporate more formative assessment into their instruction as a means of engaging and motivating their students.

*Committee for Protection of Human Subjects*

Various steps will be taken to ensure participants’ confidentiality. Each participant will receive an identification number prior to the start of the study. This identification number will be used to label all test and survey materials and other related study items. The researcher will use the number to analyze data instead of subjects’ real names. No personal identifying information will be included with the research results. All information about subjects will be kept strictly confidential to the full extent allowed by law. Only the researcher will have access to information. The researcher will store all information in physical formats (paper test and surveys) in a locked cabinet and any electronic files will be saved only on the researcher’s personal computer. All file with participants information and test results will be discarded and electronically deleted after completion of this project. Subjects’ names and other information that can be identifiable to participants will never be published in study results.

*Formative Evaluation Methodology*

*Site*
The testing location will be in a classroom at Noelani Elementary School. All participants will meet in a classroom at this school on the test date. Permission to use the classroom has been granted by the Principal of the elementary school.

*Test Audience*

The subjects in this small group include 10-12 elementary teachers ranging in age from 25-38 years old. All these teachers have basic to advance computer technology skills and use computer technology in their classrooms regularly with students. However, none of them have any prior experience using SRS. Most of their technology application in the classroom includes using the Internet for web-based information searching, using online reading, writing, and arithmetic programs such as Destination Reading, Superstars, and Vantage Writing. All teachers have a general feeling towards a need to integrate technology effectively into their curriculum, however feel inadequate about their pedagogy skills using technology. Therefore, they represent the target population and can benefit from this module.

Additionally, teachers understand the basic elements of lesson planning and backward design. Although, many teachers do not create lesson plans regularly, they have the background knowledge and understanding of the different components of a backward design lesson plan. Most of these teachers have a general understanding of performance objectives.

Subjects in this study are all licensed Hawaii State teachers, therefore, have taken and passed all required Praxis examinations. Hence, basic collegiate caliber math, reading, and writing skills are expected of participants. All participants self reported their learning preference strengths as either kinesthetic or visual.
Three of the teachers have graduate degrees in curriculum studies or educational foundations and one is pursuing a degree in educational technology. However, all teachers have attended at least five different professional development workshops or completed various professional development courses. This implies that these teachers are interested in developing their skills and are open to using the most innovative and current pedagogical strategies.

Participants in this study are volunteers. Teachers choose to participate in this study either for professional development and/or because of an interest in SRS. Because no professional development credit or job-related incentive would be offered, the subjects are viewed as enthusiastic and eager participants. However, a small thank you gift of $10 in the form of a gift card will be given to all those who participate.

In summary, all participants meet the following criteria: is an elementary school teacher; have a basic understanding of lesson planning, backward design, assessment strategies, and performance objectives; and are eager to learn and participate in a technology integrated study (see Figure 2). Additionally, many of these teachers have direct access to students and can put their new knowledge, learned from the Interactive SRS Lesson Plan Template, into action.

<table>
<thead>
<tr>
<th>Affective Characteristics</th>
<th>Cognitive Characteristics</th>
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<tr>
<td>• desires to make a difference in children’s lives to prepare them to be successful learners of the 21st century</td>
<td>• possesses basic collegiate caliber math, reading, and writing skills (at the minimum)</td>
</tr>
<tr>
<td>• is open to learning new knowledge, skills, and strategies</td>
<td>• has visual and kinesthetic learning styles</td>
</tr>
<tr>
<td></td>
<td>• has developing or advance ability to create quality lesson plans</td>
</tr>
<tr>
<td></td>
<td>• possesses general assessment strategies</td>
</tr>
<tr>
<td></td>
<td>• attends various workshops and professional development courses</td>
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<table>
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<tr>
<th>Physiological Characteristics</th>
<th>Social Characteristics</th>
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The small group consists of 10-12 voluntary teachers who are able to complete the entire self-instructed module and complete the series of tests and surveys. A one-to-one reviewer session will be conducted prior to the small group testing. The one-to-one reviewer will be a person who represents the target audience, but is not a part of the small group. The following procedure—administration of three criterion-referenced tests and both the demographic and attitudinal surveys—will be completed in its entirety first with the one-to-one reviewer and later with the small group. Necessary revisions will be made to improve the module based on the one-to-one feedback prior to small group implementation.

In order to assess the learners’ knowledge of the Interactive SRS Lesson Plan Template, quantitative data will be collected through criterion-referenced tests, including a pre, embedded, and post test. The pre test will assess any prior knowledge before participation in this study. The pre test results will offer insight for the instructional designer to determine what information should be included in the module based upon the learners’ knowledge and skills. The embedded test will act as a mode of practice for learners to apply their new skills almost immediately throughout the module. The learner will be provided with immediate feedback on all embedded test questions. This will aide in the process of self assessment as well. Finally, the post test will assess learners’
knowledge and skills of all the concepts presented in the module. This test will be distributed at the conclusion of the module and will be used to determine whether the design of the module was effective in meeting performance objectives including the terminal objective.

Qualitative data will also be collected through the use of a demographic survey and attitudinal survey. The demographic survey will provide data that will be analyzed to determine if anomalies in quantitative data of the tests may be influenced by participant demographics. The attitudinal survey will be administered at the end of the study. This survey will serve as a reflective and insightful instrument that will collect information regarding the participants’ personal opinions related to the module.

**Instruments**

The demographic test will be administered using SurveyMonkey.com, a password-protected online survey software. Directions to the survey will be sent to participants via their email addresses. The demographic survey will collect general information about each participant. In addition, the demographic survey will include 25 Likert-scale questions and five open-ended questions regarding their background and experiences using technology in the classroom.

A paper-based method will be used to deliver the pre test, embedded test and post test. As participants complete the self-directed online module they will also be given a supplemental packet, which includes the embedded test. The module will indicate at which times the participants should stop and answer a question in the embedded paper-based test packet. Participants will answer a series of multiple-choice questions for all three tests that align with each performance objective. Additionally, questions across all
three tests will be parallel to one another. Each test will include a culminating activity that requires the participant to complete the lesson plan template by filling in sections of the template. Each multiple-choice question will be given 1 point if answered correctly and 0 points if answered incorrectly. The success rate for each performance objective will be determined by dividing the total number of points received in the corresponding performance objective by the total possible within the specific performance objective set. Each performance objective set consists of 1 to 4 multiple-choice questions. The success rate for culminating activity will be determined by dividing all correctly answered test questions from all sections in the lesson plan template by the total number of questions from all sections in the lesson plan template.

The attitudinal survey will be administered using SurveyMonkey.com, which will be sent to participants via their email addresses. The attitudinal survey will include 25 Likert scale questions and five open-ended questions regarding their experience participating in the instructional design project and their feelings toward SRS.

Data Analysis

Quantitative data, which includes pre, embedded, and post test, will be organized into graphs and charts to represent anomalies. Charts and graphs will then be analyzed in descriptive written form. Qualitative data, which includes demographic and attitudinal survey, will be represented in descriptive written form. Care will be taken to use participant identification numbers and not personally identifiable information.

Timeline

A timeline is created for the researcher, which list all tasks and due dates in an orderly and logical manner that adheres to the College of Education Educational
Technology Program’s milestones (see Figure 3). Each participant involved in this study will receive a timeline of all expected tasks, which includes a specified completion due date.(see Figure 4).

<table>
<thead>
<tr>
<th>Date</th>
<th>Procedures for Instructional designer</th>
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</table>
| October 2009 | • Approval on proposal and literature review  
• Develop hierarchy of objectives                                                                   |
| November 2009| • Develop module and materials                                                                      |
| December 2009| • Human Subjects approval  
• Distribute consent forms and commitment forms to participants                                     |
| January 2010 | • Conduct one-to-one review session  
• Revise module  
• Administer demographic survey and pre test to small group                                           |
| February 2010| • Small group testing: module and embedded test, post test, and attitudinal survey                   |
| March-May 2010| • Send out thank you cards to all participants  
• Data analysis and interpretation  
• Write up paper                                                                                     |

Figure 4. Instructional designer timeline

<table>
<thead>
<tr>
<th>Date</th>
<th>Procedures for Participants</th>
</tr>
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</table>
| December 2009 | • Review consent form, sign and return to instructional designer  
• Review commitment form, sign and return to instructional designer                                       |
| January 2009  | • One-to-one session with reviewer: demographic, pre test, module and embedded test, post test, and attitudinal survey  
• Small group: demographic survey and pre test                                                                 |
| February 2009 | • Small group: module and embedded test, post test, and attitudinal survey                                    |
| January 2010  | • Conduct one-to-one review session  
• Revise module  
• Administer demographic survey and pre test to small group                                              |
February 2010

- Small group testing: module and embedded test, post test, and attitudinal survey

March-May 2010

- Receive thank you cards in mail

Figure 5. Participant timeline

Limitations

Ideally, the instructional designer would have participants implement and test the effectiveness of the lesson plan they create with a group of students. However, due to the scope of the project, technological limitations, and time factors, it is not a feasible objective to pursue. Hence, creating a lesson plan using the Interactive SRS Lesson Plan Template is the terminal objective. However, participants are encouraged to implement the lesson plans on their own time with students.

Assumptions

Most assumption about learners are confirmed with the demographic survey. However, the assumption that all participants have the desire to make a difference in children’s lives to prepare them to be successful learners of the 21st century and the assumption that they are open to learning new knowledge, skills, and strategies are derived from the responses for the attitudinal and demographic surveys. Also, since all participants are certified teachers they must have passed the existing state Praxis exams, which require collegiate reading, writing, and math skills, as well as general skills in lesson planning and performance objective writing.

Summary

SRS has proven to be an effective tool in large enrollment college classes. Students like using SRS because it promotes active learning in large-class environments (Greer & Heaney, 2005). When SRS is used in conjunction with effective peer instruction
strategies and best pedagogical strategies, students become more involved in the learning processes and have a sense of personal ownership over their contribution to the class (Beatty, 2004). Ongoing formative, as well as summative assessments become possible with the use of SRS. SRS enable both the teacher and student to receive immediate feedback, which allows for timely remediation and contingent teaching and helps the student monitor their comprehension and self assess their understanding. In addition, when using SRS, clerical and administrative tasks for teachers are either reduced or eliminated, which may give the teacher more time to spend on planning engaging and meaningful learning experiences. With the students’ results from SRS, teachers have data at their disposal to assess the needs of their students, which allows for better instructional planning. Better instructional planning results in more motivated and engaged students.

Didactic routine lectures often fail to engage all students in the learning process. Using a much more interactive approach such as implementing SRS has deemed to be a more effective method of instruction. Much research reveals that SRS promotes participation from all students, as it requires all students to respond to the questions generated by SRS. Additionally, SRS promotes communication for the more reserved students who are afraid to speak up in class. As a result of the greater student participation, a stimulating classroom community is created. Peer collaboration is also an important aspect of effective implementation of SRS. Collaborative strategies can be implemented with SRS.

Although there have been many studies on SRS in higher education, very little research studies are available on SRS in a K-12 educational environment (Penual, Boscardin, Masyn, & Crawford, 2006). However, the studies that do take place in K-12
environments, suggest that many of the teaching pedagogical practices used in higher
education are also being used in K-12 classroom environments (Boscardin et al., 2006).
Hence, an instructional design module created for elementary teachers deems necessary
to support the need for teaching best practices and pedagogy for effective SRS
technology integration:

“Learning to operate the technology is the easiest part of becoming facile with CRS [SRS]-based instruction. More difficult challenges include creating and adapting suitable question, cultivating productive classroom discourse, and integrating CRS [SRS] use with the rest of the course, with curricular material, and with external constraints” (Beatty et al., 2005)

Research on SRS in educational environments reveal abound potential on improving classroom learning. Although much research remains to be done to explicate why SRS are effective tools in the classroom, SRS does appear to enhance learning by creating an active learning environment, increasing participation, and increasing student enjoyment (Caldwell, 2007). Informed by research in higher education settings, through proper implementation techniques, pedagogical strategies, and effective questioning, SRS could also increase motivation, engagement, and learning in an elementary classroom setting.
References


