# SITE Proceedings

# Professional Development for Technology Integration in the Early Elementary Grades

Cassie Froemming
Doctoral Student
Teacher Preparation, Administration, and Leadership
New Mexico State University
1780 E. University Ave.
Las Cruces, NM 88003
Phone: (320) 583-5158
Email: cassief@nmsu.edu

Lauren Cifuentes
College Professor
Teacher Preparation, Administration, and Leadership
New Mexico State University
1780 E. University Ave.
Las Cruces, NM 88003
Phone: (979) 575-4305
Email: laurenci@nmsu.edu

**Abstract**: This qualitative research study sought to identify effective elements of professional development that encourage technology integration by early elementary educators. Puentedura's (2014) Substitution, Augmentation, Modification, Redefinition (SAMR) model served as the framework for measuring the extent to which the teachers integrated technology as a result of a socially rich, learner-centered professional development experience designed to enhance the integration of Seesaw, an online communications and portfolio tool. The questions that guided this study before, during, and after the professional development intervention were: How do K-3 teachers change in their adoption of technology in their classroom teaching practices as a result of SAMR focused professional development? And, what SAMR focused elements of the professional development facilitated change in the K-3 teachers' integration of purposeful technology in their classroom teaching practices? Findings indicate the effectiveness of a socially oriented, student-centered, performance-based workshop with online support during classroom implementation and align with the literature.

## Introduction, Theoretical Framework, and Literature

This study aims to explore how early elementary teachers' digital teaching practices may be impacted by a professional development intervention that facilitates the adoption of the Seesaw application. The purpose is to better inform teachers, educational leaders, and policy makers of the possibilities and challenges associated with rapidly changing digital learning tools and the elements of professional development that encourage grades K-3 teachers to integrate technology meaningfully into their instructional plans.

The emergence of new digital tools, apps, and mobile devices has implications for teaching and learning in the kindergarten through grade three, or early-elementary grades. A growing body of research indicates that many children are now entering kindergarten with prior digital experiences (National Association for the Education of Young Children - NAEYC - and the Fred Rogers Center for Early Learning and Children's Media 2012; Blair, 2012: Guernsey & Levine, 2015; Barone, 2016; Common Sense Media, 2017). Common Sense Media (2017) reported that 95% of America's children ages birth to eight have access to mobile devices, and these children are spending an

average of 48 minutes each day on those devices. Early exposure appears to have changed the learning demands of young children (Prensky, 2001). Hence, traditional teaching practices no longer suffice.

Technology is beneficial when it is integrated into instruction in developmentally appropriate, purposeful ways (Guernsey & Levine, 2015). Unfortunately, many early elementary teachers are not yet integrating digital learning tools to the fullest potential, even though they are expected to "be knowledgeable and prepared to make informed decisions about how and when to appropriately use, integrate, and evaluate technology and media to meet the cognitive, social, emotional, and linguistic needs of young children" (NAEYC & the Fred Rogers Center for Early Learning and Children's Media, 2012, p. 11). The integration of new technologies for teaching and learning can be led by teacher influencers (Taylor, 2017). Qualitative research can provide the evidence-based insight necessary to fully understand how to develop, improve, and support innovative digital teaching practices in the early elementary grades (Office of Educational Technology, 2017).

The new technologies afforded to young children create many pedagogical challenges for early elementary teachers, yet elements of professional development that overcome these challenges are yet to be realized (Barron, Cayton-Hodges, Bofferding, Copple, Darling-Hammond, & Levine, 2011). Some teachers embrace the practice of integrating purposeful technology into their classroom instruction, yet many are reluctant to do so (Blackwell, Lauricella, & Wartella, 2014; Marsh, et al., 2015). Flewit, Messer, and Kucirkova (2015) assert that, "if innovative uses of new technologies continue to remain absent from the school curriculum and from pedagogy, then we risk turning our backs on a powerful switch that can provide new directions to light up this generation's learning" (p. 27). Knobel and Kalman (2016) further insist that teachers must be skilled in navigating new technologies and be able to purposefully integrate them into their daily teaching practices (p. 8). The collective education research community maintains that it is paramount to identify on-going, hands-on professional development opportunities for early elementary educators so they may be successful in their adoption of digital tools and practices specifically designed with young digital learners in mind (Barron, et al., 2011; Guernsey & Levine, 2015).

Several models exist to ensure appropriate and purposeful use of technology, which is essential for the delivery of high quality, student-centered instruction. Puentedura (2015) claims that through implementation of his popular Substitution, Augmentation, Modification, Redefinition (SAMR) model, technology should ultimately modify or even redefine learning outcomes. Puntedura argues that if a technology tool only substitutes what can also be done using traditional paper and pencil activities, it is not used purposefully. In other words, if an activity is only conceivable through the use of the digital tool, then it is purposeful.

Calvert (2015) fully endorses SAMR when used symbiotically with station teaching for a variety of reasons. Station teaching can enhance instruction, especially when skills are taught in authentic contexts for learning. This time-saving approach for integrating technology into learning across the content areas can be beneficial to young learners. Green (2014) however, claims that while recent research suggests that the SAMR model may be beneficial, he cautions educators not to misuse this model as a premise for shaping pedagogical beliefs because Puentedura's work is not fully backed by peer-reviewed research. Green suggests that SAMR should be used in light of a more student-centered approach and that authentic learning experiences should focus on enhancing the meaning making process. Hamilton, Rosenberg, Akcaoglu (2016) argue that although SAMR is used in many schools today, more qualitative and quantitative research on the impact of SAMR needs to be conducted within flexible, learner-centered contexts due to the rigidity of the model and the dynamic nature of technology integration processes in teaching and learning.

There is a need to identify elements of professional development that support early elementary educators in the adoption and implementation of digital learning tools. Professional development is most beneficial when it supports social-construction of understanding, is learner-centered, and is personalized. In addition, Green and Cifuentes (2011) found that online follow-up to professional development and peer interaction had positive effects on the quality of outcomes and completion. And professional development that facilitates learning communities, or networks, can support both follow-up and peer interaction (Cifuentes, Maxwell, & Bulu, 2011).

Research shows that personalizing interventions encourages rates of technology adoption, (LaMorte, 2018). Perhaps the most important element for the successful adoption and implementation of new technologies is asking for volunteers rather than imposing professional development on teachers (Taylor, 2017). Studies also found that two-hour professional development workshops initially inspired teachers to integrate technology into their instructional plans, but their motivation quickly faded due to lack of consistent coaching and on-going support (Cifuentes & Green, 2011; Delaney, 2011). Blair's (2012) findings from a technology needs assessments indicated that teachers would benefit from having an in-house technology coach to assist with their technology teaching and learning needs, specific to their own classroom setting. Yet while face to face technology coaching may seem ideal, McLoughin and Lee (2008) discuss a pedagogical shift toward on-demand learning due to the emergence of information sharing networks. Online communities, also known as Personal Learning Networks (PLNs), provide

real-time resources and support that teachers need in order to keep up with their students who come to school primed as creators, makers and designers of digital products. Delaney (2011) found that teachers need a combination of professional development, technology coaching, and PLNs to boost their confidence, motivation, and skills for integrating technology into their classroom instruction. Moverover, Gamrat and Zimmerman's (2014) research showed that micro-credential, digital badge systems showed promise for a more flexible, personalized professional development experience based upon goal setting and teacher needs within the context of their own classrooms. There is a need to identify elements of professional development that specifically supports early elementary educators in the adoption and implementation of digital learning tools in the context of their own, K-3 classroom settings.

The research objective here is to examine effective elements of professional development that encourage technology integration by early elementary teachers. The SAMR model was explored through a social-constructivist lens. This professional development experience was designed so that "educators will be supported by technology that connects them to people, data, content, resources, expertise, and learning experiences that can empower and inspire them to provide more effective teaching for all learners" (Office of Educational Technology, 2017, p. 28). Elements explicitly designed into the professional development were:

1) applying SAMR levels to digital tool use,
2) developmentally appropriate practice,
3) personalization,
4) stations where teachers can independently or with peers explore the technology tools,
5) one-on-one face-to-face support,
6) one-on-one online support,
7) online personal learning network (peer interaction),
8) access to resources both face-to-face and online,
9) anywhere, anytime, on-demand participation and feedback,
10) opportunities for reflections,
11) scaffolding,
12) learner-centered,
13) in-house technology coach, and
14) micro-credential badging.

The intention was to learn how K-3 teachers change in their adoption of technology in their classroom teaching practices as a result of SAMR focused professional development. And, what elements of the professional development facilitated change in the K-3 teachers' integration of purposeful technology in their classroom teaching practices?

## Methods

This naturalistic inquiry was conducted within a social-constructivist paradigm in which meaning is actively co-constructed through human interaction and the interpretations of previous and present lived experiences (Creswell & Creswell, 2018). The participants' interactions were interpreted using a participatory approach to the inquiry process, and the overall findings were explored through the social-constructivism paradigm lens (Creswell, 2013; Egbert & Sanden, 2014, Stringer, 2007). When taking the social-constructivist approach, qualitative researchers rely on their participants' views to contextualize and construct knowledge of the problem being investigated.

This study took place in a small, upper Midwest, outer suburban city, well-known for manufacturing, with a population of approximately 15,000. The superintendent and two principals in the school district requested professional development to encourage adoption of Seesaw for communication and development of student portfolios, because although Seesaw for Schools premium paid version had been previously piloted in the early elementary schools, teachers were resistant to adopt the software.

Seven out of nine kindergarten teachers and seven out of eight first grade teachers had volunteered to pilot Seesaw for Schools. During the pilot period, four professional development sessions were offered. The teachers were encouraged to attend at least one or two of the professional development sessions, but they could also arrange for one-to-one sessions for those uncomfortable due to limited technology knowledge and/or abilities. None of the teachers took advantage of the one-to-one learning opportunity. The teachers who participated in the pilot only attended one of the workshops, even though they were asked to try the materials covered and return to the next workshop with questions. Due to the teacher resistance, minimal participation in trainings, limited use of the application, and cost, the premium paid version was not officially adopted. Some teachers continued integrating the

free Seesaw application, which does not allow the teachers to share lessons in the activities library, utilize a shared activities folder for the school, or access a private teacher folder. The school's technology liaison claimed that many teachers who continued to use Seesaw were using only the most basic of the free features to post student work and/or family announcements, and therefore would benefit from Seesaw workshops directly aligned with the SAMR model (personal communication, 2019). This professional development experience provides the context for learning what elements of professional development are effective at encouraging technology adoption in the school district.

The research sites were two kindergarten through third grade elementary schools. The K-3 classrooms include internet access, an interactive white board, a computer, a laptop or a Chromebook, and the ability to check-out mobile devices for student use. The district follows the Professional Learning Community model (Marzano, 2003; Hattie, 2009), where the teachers meet weekly prior to the arrival of their students, for approximately 45 minutes. The teachers meet in grade level teams to examine and discuss instructional strategies, student data, and school improvement. The district holds staff development opportunities each trimester, as well as monthly two-hour late start meetings. Technology in the district is supported by a technology innovation specialist in the district.

Participants included the professional development designer and facilitator/researcher, a technology liaison, and the five kindergarten through grade-three teachers who have tenure and volunteered to participate. Each participant played a vital role in the study.

The procedures included collection of data before, during, and after the technology professional development intervention. Before the intervention, the K-3 tenured teachers completed and submitted informed consent and pre-intervention survey data. The purpose of the pre-intervention survey was to gain insight into the state of teachers' technology integration in their classroom teaching practices prior to the intervention. Data collected also informed the researcher of teachers' needs so that the professional development facilitator/researcher could personalize the technology professional development experience. During the intervention, the teachers participated in a one-day, six-hour face-to-face technology professional development workshop on SAMR, a framework for technology integration, and on how to integrate Seesaw in the classroom. The face-to-face workshop was followed by six-weeks of online support in the Seesaw Demonstration Classroom that provided for a professional learning network where all participants and the researcher communicated with one another as the teachers integrated the Seesaw application in their classrooms. The teachers submitted a guided teaching reflection and self-reported their SAMR focused technology integration competency levels (Christensen & Knezek, 2008). Then they filled out a post-intervention survey to identify changes in teachers' integration of technology in their classroom teaching practices as a result of the professional development and to identify elements of the professional development that facilitated such changes. Last, the teachers participated in a focus group.

Data sources were the Pre-Intervention Survey, the Post-Intervention Survey, researcher notes, teachers' reflective journals, digital artifacts, and a focus group. The pre-intervention survey and post-intervention survey were developed and administered by the researcher. Both surveys were administered online using RedCap prior to the professional development experience and again at the end of the intervention. Baseline and post-intervention data were gathered regarding participants' technology teaching and learning needs, technology integration skill level, and technology integration perceptions.

Data analysis took place before, during, and after the professional development. A comparison of pre-intervention and post-intervention survey data determined the impact of the overall professional development experience on their technology integration. The pre-and-post intervention surveys were examined by using frequencies of themes in conjunction with descriptive analysis; this included closed-coding for the yes/no questions and open-coding for the open-ended questions. The researcher iteratively examined her notes, the teachers' journal reflections, the digital artifacts, as well as the focus group transcription to identify and code emerging themes regarding participants' reactions to SAMR as well as elements of the professional development that positively impacted technology integration.

Member checking and external audits were applied to ensure accuracy in the transcription and to identify themes and categories.

## Results

We are in the process of data analysis. Preliminary findings are that the professional development experience was positively received by the participants. The participants changed in their technology integration as a result of the Seesaw professional development. Though some had already adopted Seesaw, most moved from resistance to adoption during the intervention period. Take for example, the data gathered from a teacher who initially showed evidence of resistance in the pre-intervention survey, as well as the face-to-face workshop. During the implementation period, she sought one-on-one support and later demonstrated a solid understanding of the

SAMR model by her digital artifacts, self-reported competencies, and teaching reflections. Change was also captured in the following private message exchange between the researcher and teacher:

Researcher: "How has everything been going so far with your activities? Do you have any questions or need help with anything? I am available *any* time, day or night…I will respond to you as soon as possible, you can call, email, or even text me with any questions you may have!"

Teacher: "I did it (Seesaw) today and it went great! Kids loved it and have no problem using it at all. I just did the photo part and used text boxes and recording. They were pumped!!!"

The teacher further demonstrates a shift in her digital teaching practices in her following journal reflection:

> I really appreciated the one to one help. I learn best myself by doing, so the step by step guidance and then trying it again in the break out stations. My hardest issue is also coming up with lessons. I really appreciated being told and learning about all the lessons that are already created for teachers. This helped make it not so overwhelming to me and an easier task to tackle. I feel like I need to jump in more and not be so afraid… This is just a start and a huge step forward for me. Thanks for giving me the push I needed. It is not as scary as it seems.

The data depicts the positive impact of the professional development experience and evidences how change can be facilitated when K-3 teachers have support in their digital teaching practices. Each of the elements explicitly designed into this professional development are under exploration with the intent to answer the research questions and help teachers develop their identities to what the Office of Educational Technology (2017) terms as "fluent users of technology, creative and collaborative problem solvers; and adaptive socially aware experts throughout their careers" (p. 37).

Effective elements of the professional development noted by the participants were the learner-centered design, the presence of an easy to use online community of practice, the ability to interact with each other to discuss their practices, the focus on developmentally appropriate literacy instruction, the SAMR approach to scaffolding and higher order thinking skills, and the focus of Seesaw on incorporating culture and language in education-based communications. These findings align with the literature and indicate the effectiveness of a socially oriented, student-centered, performance-based workshop followed by online support during extended classroom implementation.

## Discussion and Conclusions

This study affirms social-constructivist learning theory by validating the impact of social interaction among participants during and following professional development on their adoption of Seesaw. It also helps teachers recognize that they typically use technology to address low level thinking-processes (substitution and augmentation), as opposed to high level thinking-processes (modification and redefinition) as described in the SAMR approach to learning technology integration. Findings inform developmentally appropriate practices for technology integration because what teachers learned in this scaffolded, personalized, learner-centered professional development experience, positively impacted each teacher's instructional practice so they serve their young students in developmentally appropriate ways. Many early elementary teachers need professional development to facilitate the adoption of developmentally appropriate digital learning tools and to refine their digital teaching practices. Identifying elements of professional development for technology adoption that address teachers' needs and concerns informs diffusion of innovations theory as well as professional development practice in the early elementary grades.

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