Journal of Educational Research and Practice
2011, Volume 1, Issue 1, Pages 23–35

DOI: 10.5590/JERAP.2011.01.01.02

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Phenomenological Investigation of Elementary School Teachers Who Successfully Integrated Instructional Technology Into the Curriculum

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Technology integration in school curricula promotes student achievement, yet many teachers are not successfully integrating technology for learning. This phenomenological study explored the strategies of 10 elementary teachers in Georgia who overcame barriers to technology integration to successfully incorporate lessons within the public school curriculum. To understand the successes, we assessed strategies for overcoming barriers, intrinsic and extrinsic motivators, and professional development experiences. Rogers's innovation-decision process provided the theoretical foundation and data sources consisted of an open-ended questionnaire and two in-depth, semistructured interviews. Data were coded for preliminary categories, and themes were generated using open coding. Despite common barriers, the findings suggested that critical factors for successful integration included moderate technical skills, self-motivation to engage in instructional technology, supportive peer communication channels, and flexibility in approaches for planned lesson.

Keywords: *elementary school, instructional barriers, successful practices, technology integration*

Introduction

Even though technology access in many schools has increased dramatically, few public school classroom teachers successfully integrate instructional technology with their students (Hofer & Swan, 2008–2009; Levin & Wadmany 2006–2007, 2008). We conducted an analysis of why some teachers were able to successfully integrate technology in their classrooms by exploring the barriers they overcome. These barriers were found in teacher attitudes and beliefs about technology in an era of high-stakes testing, the availability of technology support, strategies for gaining technological skills and know-how, teacher self-efficacy in using technology, and established pedagogy and classroom practices. Rogers's (2003) innovation-decision process was used to explain the adoption process for teachers who successfully integrated technology into teaching and learning. This study used an open-ended survey and two interviews with the teachers to determine how they had been able to successfully integrate technology in their classes.

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Literature

Technology and Academic Success

The more technologically astute the teacher, the better the learning experience is for the students (Hofer & Swan, 2006, p.192). Whether for instruction or learning activities, use of technology in educating was perceived by teachers as resulting in increased engagement, skills, learning, and academic achievement (Walden University, 2010). Teachers may develop knowledge about the benefits of technology for learning before their beliefs emerge (Chen, 2008). Chen found that teachers strongly agreed that instructional technology is advantageous for students and teachers, but the beliefs that lead them to actually use technology with their students was shaped by previous negative experiences.

In a mixed-methods study, Li (2007) investigated the perceptions of teachers and students in a Canadian school about the use of technology for learning. He found that teachers and students held opposing views to using technology for learning because of their different goals. The goals of the teachers were to "survive" the demands and challenges of diverse students in the learning environment. The students were focused on having the process of learning being efficient, engaging, and exciting.

Students used technology for learning outside of the classroom and believed that it was a tool that facilitated learning and made it more efficient and interesting. Students acknowledge that the use of animations, simulations, and other interactive technologies would prepare them for a society that is becoming increasingly more technical. "Student needs are more likely to be met when teachers are able to make active decisions regarding curriculum, assessment, instruction, and the use of technology" (Robinson, 2005, p. 57).

Barriers to Technological Integration

The beliefs, attitudes, and personalities of teachers have an influence on technology integration in K–12 (ChanLin, Hong, Horng, Chang, & Chu, 2006). This process requires time and often spans many years in order for the beliefs and attitudes of teachers to change. Because the teaching and learning process takes place in a complex environment, the introduction of innovative technological instruction is a process that requires a change in teacher beliefs and attitudes, along with pedagogical knowledge (Pundak & Rozner, 2007). Teacher resistance toward adopting innovative technologies was influenced by the belief of some teachers that computers will soon replace the physical classroom teacher (Li, 2007, p. 391). Beliefs and teaching behaviors are not likely to be abandoned by teachers, but are enhanced with new ones as a result of professional development (Levin & Wadmany, 2006–2007, p. 174).

The determining factors affecting student-centered technology integration were perceived by teachers to be their ability to overcome the stress of immediate priorities in the classroom, time constraints, curricula mandates, and pressures of high-stakes testing (Brown & Warschauer, 2006; Zhoa, 2007, p. 328). Even among teachers who believed in the benefits of frequent use of technology for learning, the pressures of standardize testing often prevented them from acting on their stated beliefs (Chen, 2008, p.23; Lim & Chai, 2008). Sociocultural factors trumped the sound pedagogical beliefs of many teachers.

The integration of technology hinges on a variety of supports beginning with teacher beliefs and attitudes. Beyond this, important barriers to overcome were factors in the learning environment, the

ability to integrate nonstructured tasks into the existing curriculum, and having a solid support system with full resources (Levin & Wadmany, 2006-2007).

Motivators to Integrate Technology

Teacher resistance to technology integration provides a barrier to student achievement when students aren't permitted to use technology for learning. McKenzie and Scheurich (2008) found four recurring beliefs that contributed to teacher resistance to social change including technological innovation. First, teachers expressed that factors outside the classroom such as SES and race were the cause of low achievement and achievement gaps. Second, teachers reported that they felt accountability systems and high-stakes testing mandates were destructive factors to them and to what they were able to accomplish in their classes. Third, they viewed suggestions for change in their pedagogy as being personal critiques rather than productive or constructive. Finally, they felt they were not being treated as leaders (p. 117). McKenzie and Scheurich suggested that teacher morale could be improved, resulting in positive social change, if school leaders helped teachers redefine how they viewed their role and value in schools. Low self-efficacy may affect teachers' willingness to integrate technology in the learning process.

Self-efficacy has to do with the confidence teachers have toward meeting a goal and is a predictor of human behavior. Rada (2011) suggested that when determining a teacher's attitude concerning technology usage, an evaluation of the teacher's self-efficacy regarding the use of technology is essential. Teacher self-efficacy can be increased through exposure to technology integration and professional development (Niederhauser & Perkman, 2008, p. 109). Self-efficacy boosted competence and confidence with tools and resources related to productivity (Overbaugh & Lu, 2008, p. 56). Professional sessions geared toward technology were conducive in aiding teachers to break from their established pedagogy and classroom practices (Bauer & Kenton, 2005).

Professional Development

Niederhauser and Perkmen (2008) concluded that even if all external barriers to technological integration were removed for teachers and students, that it would not be a natural process for teachers to use technology authentically for learning without training. The leap from personal technological use to its inclusion for innovative learning requires professional development (Keengwe, Onchwari, & Wachira, 2008; Sahin & Thompson, 2006). Pedagogical reform regarding technological innovation was directly related to the amount of time spent in professional development (Penuel, Fishman, Yamaguchi, & Gallagher, 2007).

Three key motivators for technological innovation were found among 92 preservice teachers: external rewards, self-contentment and internal rewards, and social recognition (Niederhauser & Perkmen, 2008). When they conducted a follow-up study 6 years after the initial study, they found the participants had the same level of excitement toward technology integration and usage as they had in the earlier study. They attributed this finding to the ongoing professional development the teachers encountered as they engaged in the integration of technology in their own classrooms.

Rogers's Innovation-Decision Process

Successful technology integration initially hinges on the teachers' desire to be a trailblazer (Lim & Chai, 2007, p. 77). This research was based on the conceptual framework of Rogers's innovation-decision process theory that is defined as,

> The process through which an individual (or other decision-making unit) passes from gaining initial knowledge of an innovation, to forming an attitude toward the innovation, to making a decision to adopt or reject, to implementation of the series of choices and actions over time through which an individual or a system evaluates a new idea and decides whether or not to incorporate the innovation into ongoing practice. (p. 168)

The innovation-decision process is a derivative of Rogers's diffusion of innovation theory, which focused on how innovations are communicated through channels and received over a period of time within a social system.

Rogers (2003) postulated five sequential stages of the innovation-decision process. The innovation-decision process stages included knowledge, persuasion, decision, implementation, and confirmation. Teacher-participants provide information from their experiences with technology integration in order to determine specific innovation-adoption categories. This study analyzed the teacher-participant questionnaire, interview transcripts, and audio recordings for themes that describe which specific innovation category each teacher-participant behavior exhibits, and obtained information about the sequence they followed moving to the successful integration of technology in the classroom.

Method

In this qualitative phenomenological study, a purposive sampling of 10 elementary school teachers was invited to participate through referrals from each teacher's school administration, based on proficiencies in utilizing technology for instruction. These teachers had reputations for promoting environments conducive to computer-based learning and technology integration. Two Caucasian males and eight Caucasian females—ranging in age from late 20s to late 40s—participated in the study, which took place in a small metropolitan school district near Atlanta, Georgia, during the spring of 2010.

Research Questions

1. How do teachers who successfully implement instructional technology in the elementary classroom overcome such key barriers to technology integration as (a) teacher attitudes and beliefs, (b) nature of technology, (c) lack of teacher technical skills and know-how, (d) teacher power or social positionality, and (e) established pedagogy and classroom practices?

2. How did the intrinsic and extrinsic incentives teachers experience have an impact on their successful integration of instructional technology into the curriculum?

3. What impact do professional development experiences have in preparing teachers to integrate instructional technology in the curriculum?

4. In what ways does the behavior of teachers who successfully integrate technology in the curriculum reflect Rogers's (2003) innovation-decision process?

Data Collection and Analysis

Data were collected using an open-ended questionnaire and two in-depth interviews. Responses to the questionnaire were analyzed to provide a foundation for the interviews; data from the surveys were reanalyzed after the interviews for words or phrases that could be categorized or themed in support of the data from the interviews. A field note log in which participant mannerisms and

behaviors undetected by the audiotape were recorded, room or lab arrangements were noted, and discrepancies springing from data analysis were pinned and clarified during member checking.

After the data from the initial semistructured interview were transcribed and analyzed, participants were probed in greater detail in regard to their responses. A second interview was conducted to investigate further and for member checking. Relevant information from the second interview was transcribed for analysis.

Results

Data were analyzed for themes and patterns in reference to the four research questions. The focus of the questions was in discovering how various barriers were overcome and how participant success was gained when integrating instructional technology into lessons. Responses to the research questions were triangulated from a questionnaire and two separate interviews with 10 teachers.

Research Question 1: *How Do Teachers Who Successfully Implement Instructional Technology in the Elementary Classroom Overcome Such Key Barriers to Technology Integration as (a) Teacher Attitudes and Beliefs, (b) Nature of Technology, (c) Lack of Teacher Technical Skills and Know-How, (d) Teacher Power or Social Positionality, and (e) Established Pedagogy and Classroom Practices?*

Four themes regarding teacher attitudes and beliefs surfaced: sustained student attentiveness, valuable time saved, different way of presenting lessons, and new learning experiences. Two prevalent themes were found related to the nature of technology: strong technological support and lesson plan flexibility. Three themes emerged under the lack of teacher technical skills and know-how topic: self-motivation, professional development opportunities, and self-submergence into technology. Two themes were found regarding teacher power or social positionality: positive view of self-efficacy and dismissal of self-efficacy. Two themes emerged under established pedagogy and classroom practice: integration of more technology and combination of technology with tradition.

Teacher Attitudes and Beliefs

Each participant held positive attitudes and beliefs toward the regular use of instructional technology due to the pressures of the Georgia state standardized testing Criterion-Referenced Competency Test. Four themes regarding teacher attitudes and beliefs surfaced: sustained student attentiveness, valuable time saved, different way of presenting lessons, and new learning experiences.

Sustained student attentiveness. Student focus increased when technology was integrated into the lesson plans of five participants. Regardless of students' academic ability, economic status, race, or native language, instructional technology captured their focus and engaged them better than a traditional approach. Successful integrators drew students' attention through the technology that they were exposed to outside of school. Teachers would go beyond the capabilities of the technology to focus on the principle issue of student achievement.

Valuable time saved. Four participants believed that using technology with students was less time consuming than a traditional method. Having more time to devote energies toward other classroom obligations also helped the participants succeed at integrating instructional technology. Time saved allowed them to work faster and cover more material efficiently with their students.

Different way of presenting lessons. Technology was viewed as an ideal way to diversify their lessons for 7 of the 10 teachers. They wanted to go beyond the traditional way of reading and discussing subjects, so they sought fresher ways to present lessons using the same yearly lesson objectives. The use of technical media alone helped these teachers successfully present various lesson objects. When preparing students for the state standardized test, these participants believed technology was simply one of many tools that helped ease the re-creation of yearly activities. Varying the resources used to present concepts was believed to be another approach to successful technology integration.

New learning experiences. Six participants believed that instructional technology was one of many methods utilized in gaining new learning experiences. It was conducive in helping to teach students in a different way. Technology provided greater authentic learning experiences, many of which tapped into higher-order thinking skills. Through the instructional use of technology, the participants were able to spark higher-order thinking skills, support more learning styles, and provide an opportunity for more authentic learning experiences. Teachers cited this as another reason that they were successful integrators. Integrating technology as experienced by the participants allowed the dismissal of static learning and welcomed three-dimensional learning, to which the students were more receptive.

The Nature of Technology

When technical difficulties arose, many participants were self-motivated to troubleshoot the issue(s) on their own. Unlike teachers who were not strong integrators of instructional technology, if the participants could not remedy the issue, they did not abandon their lesson plans. There were two prevalent themes that developed from the nature of technology: strong personal technological support and lesson plan flexibility.

Strong technological support. When two of the participants were unable to fix technical troubles on their own, they sought assistance from their respective schools' media specialists. Media specialists in the state of Georgia usually manage a school's library and all its technological equipment, including computers and other assigned devices. The participants were grateful for their school's media specialist because it helped them remedy issues faster than they could have independently or if they had to wait for a technologist to come to the school. They lost little time and continued with the business of teaching and learning in their classrooms—which added to their lesson successes—while the media specialist sought solutions to their technicalities. This seeking out of help was a strong factor in their successful technology use.

Lesson plan flexibility. Resorting to traditional resources momentarily when technology failed was a strategy used by seven participants. Successful integrators, therefore, had another plan available and/or were quick to think on their feet if they did not have technological access. Having the lessons unimpeded by technical difficulties was very important to the participants because they believed that planned learning should not stop for this simple reason. They mentioned that once a technical difficulty arose, moving quickly and effectively to another plan was instrumental in maintaining student focus. Participants understood that a successful technology lesson called for an alternative lesson; all were aware of the unpredictability of technology. Expecting the unexpected was the subconscious mantra for majority of the participants; this awareness helped prepare them mentally for lesson success.

Lack of Teacher Technical Skills and Know-How

Each participant showed certain levels of motivational behaviors when it came to technology and instruction. This intrinsic motivation permeated their responses to questions regarding their

technological savvy. Three themes emerged under the lack of teacher technical skills and know-how topic: self-motivation, professional development opportunities, and self-submergence into technology.

Self-motivation. Self-motivation was an integral part of the successful technology integration of 8 of the 10 participants. They gained their technology savvy through intrinsic opportunities to engage with technology. Teachers were not willing to allow barriers to defeat their instructional technology plans and objectives because they believed that students deserved to learn in actively impressionable ways. In other words, the participants were self-motivated to motivate their students, which was a large part of their successes in instructional lessons with and without technology. Having a genuine interest in learning about and engaging in technology on their own time was a key characteristic to their successes.

Professional development opportunities. Four teachers shared that professional development opportunities were the catalyst for their technological know-how. The participants spoke of their preferred professional development opportunities as a way of gaining valuable hands-on, minds-on experiences presented similarly to how they would present lessons to their students. These experiences helped to build positive technological perspectives and ideas that could be transferred to their own classrooms. Hands-on professional development that engaged teachers in lessons and activities they could use with their students helped the participants become successful integrators of technology instruction.

Self-submergence into technology. One participant's success in being technologically savvy was in not always creating new instructional lessons or activities, but in searching for and modifying existing lessons. Another participant's love of technology coupled with strong self-motivation allowed her to seek authentic hands-on experiences for herself. She believed if she submerged herself into various technological advancements, she would be able to transfer this learning to her own instruction and e-learning. Unbeknownst to these two participants, their motivation to submerge themselves in technology supported the first three stages of Rogers's (2003) innovation-decision process theory: knowledge, persuasion, and decision. Learning more about technology/Websites gave them greater leverage to establish opinions that helped them decide whether to implement or reject the innovation. The latter participant admitted to being in a profession that tended to lag behind the outside world in authentic technology applications with students. This motivation prompted her to submerge herself into technology whenever possible. Ironically in her case, this deficiency in her school system was actually conducive to and stimulated her success with her students in technology.

Teacher Power or Social Positionality

Because many decisions for public schools are made by federal and state departments, some teachers have become conditioned to believe that they have little or no influence on these decisions; many teachers withhold personal ideas or opinions for this reason. They may believe that in school, teachers hold a social rank that must not be broken (Overbaugh & Lu, 2008). The majority of the participants in this study held a completely different view. Two themes emerged regarding teacher power or social positionality: positive view of self-efficacy and dismissal of self-efficacy.

Positive view of self-efficacy. All 10 teachers thought positively about their social positionality at their schools of employment. The believed their opinions on issues related to technology instruction were valued and used in local school decisions. The participants were aware that many of their colleagues depended on their successful technology experiences to propel their own. Being knowledgeable with instructional technology not only promoted the participants' successes but the successes of other, less experienced colleagues whom they influenced. The participants who were invited by the administration to lend their knowledge and opinions on their adopted innovations for

this study believed that their confidence and social positionality was elevated. This provided confirmation that what they shared was significant. They felt their opinions were respected and supported by their administrative teams and colleagues, allowing them to feel like more of an influential team player. Most participants were eager to share their concerns and successes. They believed this not only initiated other success stories but it was an opportunity to dispense awareness to those, especially the administration, who could advocate for change on higher levels.

Dismissal of self-efficacy. Two teachers downplayed their self-efficacy regarding technology reformation at their schools. Both had positive instructional technology influence to an extent, even though they did not admit it directly. Their principals recommended them as successful integrators of instructional technology. That referral alone suggested that their educational contributions were valued. Believing otherwise helped them ease the pressure of knowing they were being constantly monitored to help set the technology bar at their schools of employment. In this way, they could continue with the business of teaching and learning without the added conscious responsibility. This mental freedom helped them in this case to be successful integrators of instructional technology.

Established Pedagogy and Classroom Practices

The operational landscape in the public classroom has long depended on traditional teaching approaches for its successes with student learning. When technology was introduced into the classroom, some established classroom practices for the participants became relaxed or replaced, to a degree. The participants were asked whether or not their classroom practices deviated from established pedagogy. Many shared that they did not deviate far, revealing that the concept was the same, but the teaching resources were digital. Two themes emerged: integration of more technology and combination of technology with tradition.

Integration of more technology. Two participants stated that they utilized more technological practices than traditional practices in their classroom instruction, although they both admitted to returning to a traditional approach if there were irresolvable technical difficulties during a lesson. The use of technology proved to be better in some learning situations, and in others, the traditional methods was better. Teachers demonstrated discretion in deciding when technology was a useful tool for learning. These two participants credited their successes to intuitive professional judgment in reading their students and understanding when to switch to a different instructional approach. Successful integrators of instructional technology knew which objectives were better presented through its use and which were not.

Combination of technology with tradition. The participants all recognized the careful balance between traditional pedagogy and the integration of technology as key to their successful instructional technology integration. Much like the cases in which participants used more technology than traditional approaches to learning, it was imperative to the success of technology-integrated lessons that the teacher had the ability to know when to incorporate technology and when to resort to traditional approaches. The participants were in-tune with their students' abilities and knew when it was most conducive to use technology and when to resort to traditional delivery. This was another trait that helped them present successful lessons.

Research Question 2: *How Did the Intrinsic and Extrinsic Incentives Teachers Experience Have an Impact on Their Successful Integration of Instructional Technology Into the Curriculum?*

The participants all tended to exemplify intrinsic motivators that had an impact on their successful integration of instructional technology into the curriculum. In addition, extrinsic incentives that were indirectly present were time and professional development. The various intrinsic incentives

experienced by the participants were the residual effects of time constraints. Three themes resulted: time conservation, student receptiveness, and technological astuteness.

Time Conservation

Teachers believed that technological integration was a time saver for instruction and that it facilitated student learning. Because there were many learning objectives and skills to be taught within the 180 days of each academic school year and classroom instruction time was approximately 4 hours each day, time conservation was viewed by the participants as a success in itself. By saving time with technology, more time could be devoted toward students' academic deficiencies.

Student Receptiveness

The greatest intrinsic incentive of six teachers was finding student interest in learning and academic achievement. They found using technology to advance the academic achievements of their students as a strong intrinsic reward. As successful integrators of instructional technology, they found the motivation from within, particularly when students were actively engaged and effectively learning. Participants spoke of the "confidence" students had when they were sure of their conceptual understanding.

Technological Astuteness

Three teachers were intrinsically motivated to go beyond the simple use of technology for learning. They believed doing so had a positive impact on their instructional technology integration skills and that technology could be used to help students more fully learn. Their biggest reason to integrate technology was to make sure students were equipped with the skills they needed to progress to the next grade level. One teacher stated, "It's not just [about using] technology because you say I use the computer well. Did it better your lesson? Did your children understand it more? Did it become more real to them? If it didn't, don't use it. You use what you know." The technologically astute teacher uses technology to help learners "learn how to learn" and delve deeper into a subject.

Research Question 3: *What Impact Do Professional Development Experiences Have in Preparing Teachers to Integrate Instructional Technology in the Curriculum?*

Opportunities to attend professional technology development sessions in reference to instruction were mentioned by seven of the participants. Three themes were found regarding the impact of professional development experiences: satisfaction of intrinsic eagerness to explore innovations, facilitation of instructional technology reformation experiences, and knowledge of applicable strategies.

Satisfaction of Intrinsic Eagerness to Explore Innovations

The opportunity to receive hands-on experience with technology during their professional development sessions had a major impact on two teachers. They were able obtain immediate guidance from the facilitator with self-guided explorations while socially interacting with other teacher attendees. The participants reported being hands-on learners, so professional development sessions that fed this need were crucial to the success of their technology-integrated lessons.

Facilitated Instructional Technology Reformation Experiences

Professional development experiences had an impact on the way three teachers viewed how technology was changing the instructional panorama. Remaining current on the benefits of technologies and on ways to troubleshoot technology was an aspect that helped the participants to become successful in their own lessons because they could attempt resolving their own issues. Being

aware of the power technology incurred to positively reform current instructional situations was a quality of the participants.

Knowledge of Applicable Strategies

The biggest impact for two participants was in discovering authentic strategies that supported learning objectives using technology. These strategies helped the participants to integrate successful lessons incorporating technology because it was used as a teaching tool for learning, not solely as a tool for drill and skill. Participants believed that the hands-on professional development sessions they experienced lent them real-world insight into ways to implement, confirm, and even troubleshoot instructional technology in the classroom. Attending model classrooms through professional development sessions helped the participants tailor and apply what they had learned. Observations in model classrooms were a part of what helped the participants with the successful integration of their own lessons.

Research Question 4: *In What Ways Does the Behavior of Teachers Who Successfully Integrate Technology in the Curriculum Reflect Rogers's (2003) Innovation-Decision Process?*

Participant behavior was analyzed around four themes reflecting the innovation-decision process: student academic needs versus technology awareness, technology instruction in traditional environments, technology lesson continuance despite challenges, and social confirmation of instructional technology.

Student Academic Needs Versus Technology Awareness

Each participant believed that student academic needs were tied to their knowledge or awareness of various innovations, and most stated that the academic needs of their students drove their selection of learning activities. Teachers struggled to determine whether the lesson objective was a major factor in deciding whether students' academic needs drove technological decisions or if the awareness and knowledge of the technology to meet those needs did. Many participants concluded that the two had a reciprocal relationship. Technology could capture and hold the attention of students in ways that a traditional lesson presentation would not. The knowledge and awareness of this nonprescriptive approach led to the participants producing successful technology-integrating lessons.

Technology Instruction in Traditional Environments

Favorable experiences when implementing instructional technology into the largely traditional school environment were described by eight of the teachers. The participants found that mixing routine approaches with newer approaches helped to boost student focus, which in turn helped them academically succeed. Many participants also demonstrated that technology was not the only captivating tool for teaching and learning; a lesson could also be successful when combined with traditional approaches or when technology was used exclusively.

Technology Lesson Continuance Despite Challenges

A persistent tenacity in reconciling unplanned technical difficulties with traditional approaches in order to continue their planned lessons was exhibited by five teachers. For the participants, flexibility and quick thinking within a lesson were essential to overcoming technological difficulties. The most beneficial approach for successful teachers was to be able to seamlessly move between the use of traditional resources and 21st century tools as needed.

Social Confirmation of Instructional Technology

Five participants reported various social confirmations for their integration of instructional technology. Social reinforcement—which helped to boost motivation that triggered knowledge

seeking, the first stage of the innovation-decision process—was an important part of the participants' success. Whether the social reinforcement was from advertisers, administrators, colleagues, parents, and/or students, its presence was necessary for teachers to overcome the barriers they faced. For the participants, however, the greatest social reinforcement was positive student engagement and the demonstrated knowledge that resulted when technology was integrated. Teachers indicated that this made it all worthwhile.

Discussion and Conclusion

Traditional learning does have a place in the 21st century classroom for all of the participants. Knowing when and how to balance these two areas was important to the success of teaching and learning. The rejection of a planned lesson was not an option for the participants when technological glitches occurred; lessons were only rejected when the students did not understand the concepts and skill being taught. Even then, lessons were revisited once the students obtained a better understanding of what was being taught. Participants did not view technological challenges as helplessness; instead technological challenges fed the motivation of teachers to reinvent and deliver their lessons.

Anchoring instructional lessons for the 21st century classroom can be viewed as an intimidating task, especially considering that many students or digital natives are more technologically engaged outside of school than inside their classrooms. Using the learned experiences from successful integrators of instructional technology is one way to effect positive technological change in school systems. This also begins with district leaders initiating and necessitating the authentic integrated use of instructional technology while encouraging the use of technology district-wide and supporting local school principals in their technological decision-making.

The participants of the eight schools in this study worked with small cohorts of peers who also integrated instructional technology into their classrooms. Many of the participants did not consider themselves extremely technologically skilled; in fact, the majority of participants responded that they were moderately skilled with technology relevant to other teachers. Those who lack technological skills should be assured that it is possible for moderately skilled teachers to embark on successful instructional technology experiences.

Professional development that allowed observations and hands-on experiences were most helpful to the participants. "Sit-and-get" sessions were not conducive to teacher engagement or teacher retention of what was being shared. In other words, professional development sessions were more effective in a constructivist-learning environment. Traditional approaches to education were not completely disregarded in instruction. Many of the participants used a combination of the two, noting that it was good to have a balance.

Technology integrators are most successful when they have access to strong technological support, such as a skilled media specialist to assist in alleviating challenges as they occur. This access enabled teachers to continue their lessons with their students while the media specialists sought to resolve technical issues. Teachers who did not have this technology support in their schools were hindered in the delivery of their lessons when problems arose and were discouraged from using technology.

Successful integrators have gained valuable classroom experience necessary to facilitate the diffusion of innovations within the traditional structure of school. In addition, successful teachers had supportive administrators, colleagues, and classroom environments in which to teach. They were equipped with an intrinsic motivation that propelled their determination to integrate

instructional technology despite specific barriers that affect most technology users. Failed experiences were the catalyst to their eventual successes. Such experiences led to flexibility in lesson approaches, collaboration with others for technical support, and increased motivation.

Providing strong in-house technology support (such as a skilled media specialist who can alleviate challenges as they occur) can increase the number of teachers who successfully integrate technology in their elementary school classrooms. Administrators should extend hands-on professional development opportunities in their schools relative to instructional technology integration where teachers use the technologies they are learning to integrate. This study promotes positive social change by providing insight into ways in which successful teachers integrate instructional technology into classrooms to improve student learning objectives.

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