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Professional Development and Effective Technology Integration

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Technology drives our society and plays a crucial role in classrooms today. Technology is being purchased and put into classrooms at an alarming rate. While the impact on learning has not reached its potential; educators need to explore how we go about integrating technology so that it positively impacts educational processes and learning outcomes. This research study explored both teacher and administrator perceptions of technology integration and professional development with the intent of finding ways administrators can support teachers with integrating technology in the classroom in order to impact learning. Teachers and administrators in the Archdiocese of Galveston-Houston were surveyed and their responses were used to develop a second survey. This survey was given to a focus group of teachers at Christ the Redeemer Catholic School in Houston, Texas. The study revealed differences between: how administrators and teachers define technology integration; ways in which teachers want to learn about technology integration; ways in which administrators plan on presenting that information; and between what teachers want to learn about technology integration and what administrators are teaching during technology-related professional development.

Professional Development and Effective Technology Integration

Technology drives our society and plays a crucial role in classrooms today. In a study conducted by the National Center for Educational Statistics (2009), less than half of the 3,000 surveyed teachers reported using technology often during instructional time: it was used more frequently for administrative tasks such as grading and attendance. While the benefit of technology for administrative tasks in a school is beneficial, most experts in technology integration envision technology use that supports inquiry, collaboration and, most importantly, students who are using technology (Mishra & Koehler, 2009). Technology is being purchased and put into classrooms at an alarming rate. While the impact on learning has not reached its potential; educators need explore how

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we go about integrating technology so that it positively impacts educational processes and learning outcomes. Many professional development (PD) sessions focus on how to use the technology instead

of how to integrate technology to impact learning.

This study sought to explore both teacher and administrator perceptions of technology integration and professional development in order to find ways in which administrators might support teachers in integrating technology in order that technology positively impacts learning.

The Issue of Technology Integration in Today's Classrooms

As beliefs in education have changed, the desired role of technology in the classroom has evolved. Integrating technology into classroom instruction requires more than teaching basic computer skills and software programs in a separate computer class. In 2005, McCain stated that technology is not the critical issue facing education today, but rather the issue is in teaching students to develop thinking skills so they can use technology to do powerful work. Student learning is a major goal of education systems, but what students need to know and how they should learn material is continually being debated and researched. According to the International Society for Technology in Education (2007) and the Partnership for 21st Century Skills (2011), the skills students need to be successful in our new global economy include not only mastery of core subjects but creativity and innovation, critical thinking and problem solving, communication and collaboration skills, research and information fluency, multiple literacies, digital citizenship and technology operations and content. The goal of technology integration within the curriculum is to use technology to enhance the students learning of all of those 21st century skills. The core issue is, "how do we get teachers to possess the knowledge, attitudes, and beliefs required to enact a 21st century pedagogy" (Brantley-Dias & Ertmer, 2013) enriched in technology so that our students are fully prepared for the world?

Ascertaining what teachers want and need from PD on technology could allow administrators to more effectively support technology integration in the classroom. The purpose of this mixed methods research project was to explore teachers' and administrators' perceptions of technology-related professional development.

Literature Review

According to Hixon and Buckenmeyer (2009), technology purchases by schools are increasing but the impact on student learning is lacking. Many researchers suggest that PD is the key to effective technology integration (Ertmer & Ottenbreit-Leftwich, 2010). Niederhauser and Wessling (2011) emphasize that "just as students need to have meaningful and authentic work that drives them to inquiry, creativity, and intellectual risk, so must teachers have the same kinds of learning environments" (p. 39).

Effective Technology Integration

Effective technology integration goes beyond using technology in the classroom to using technology to support curriculum goals. In order to integrate technology effectively, teachers must be grounded in solid educational learning theories and principles (Manitoba, n.d.). According to the Center for Applied Research in Educational Technology's review of research, Nebbergall (2012) with ICF International, report one of the major benefits of effective technology integration is the increase in student learning. Nebbergall (2012) also notes that improvement to student learning happens when technology supports the curriculum objectives being assessed, provides academic performance feedback to both the student and teacher, allows students to collaborate and can extend the curriculum into teaching methods such as project-based learning. It is once a clear vision of effective technology integration is established that educational leaders can then move towards developing a plan to help

teachers do the same.

SAMR model. The SAMR (Substitution, Augmentation, Modification, Redefinition) model was developed to help teachers infuse technology in teaching and learning (Schrock (n.d.)). The four levels of technology integration in the classroom are:

1. **S:** Substitution- complete same tasks previously completed without technology
2. **A:** Augmentation- technology used to substitute but with functional improvements
3. **M:** Modification- technology allows the learning activity to be redesigned
4. **R:** Redefinition- technology allows for the creation of tasks that could not be done without the use of technology

According to Romrell, Kidder and Wood (2014), it is in the modification and redefinition levels that true potential of technology integration is fully realized. According to Kirkland (2013), this framework provides teachers and administrators a way in which to assess the level at which technology is integrated in the classroom.

Professional Development as the Pedagogical Approach to Technology Integration

Technological Pedagogical and Content Knowledge (TPACK) provides content teachers need to know about effective technology integration, the SAMR model provides an assessment about effective technology integration, and PD is the method of instruction or pedagogy to educate teachers about how to implement effective technology integration (Kirkland, 2013).

Characteristics of ineffective technology-related professional development. Potter and Rockinson-Szapkiw (2012) report that a large amount of technology purchased for a classroom is not used, and ineffective PD is often identified as the primary reason for the lack of effective technology integration. According to Ryan and Bagley (2015), some of the major weaknesses in PD are a “one size fits all” approach, viewing PD as a one-time event, holding PD somewhere other than a classroom, providing little support after the one-time event, providing no opportunity for practice, follow up or reflection, delivering PD in a traditional lecture style of teaching with little time for active learning, and spending most of the time on teaching the tool rather than on integrating the tool into instruction. Based on their research, Ryan and Bagley (2015) conclude that by implementing more effective modeling of technology integration and providing strong mentors to teachers, educators would be able to strengthen technology PD.

Characteristics of effective technology-related professional development. Potter and Rockinson-Szapkiw (2012), recommend an administrative-supported and mentor-supported approach. This approach should be rooted in constructivist and adult learning theory that also takes into account the barriers of technology integration, especially the role of teachers’ attitudes and beliefs about the use of technology. Potter and Rockinson-Szapkiw (2012) organize effective technology-related PD into three aspects: technology operation, technology application, and technology integration with mentor and community support. More specifically, Potter and Rockinson-Szapkiw (2012) report technology operation is defined as teachers knowing how to operate the technology. Once teachers know how to operate the technology, they can move into technology application: a learning environment in which time is devoted to identifying how the technology can be used in the classroom. Finally, Potter and Rockinson-Szapkiw (2012) describe technology integration with mentor and community support as support based on the premise that training must be relevant to the needs of teachers and that relevance equates to student learning.

Potter and Rockinson-Szapkiw (2012) stress that mentors can provide personalized support in the classroom, but they should have common planning time and time to spend in the mentee’s

classroom helping with implementation of technology. In his research, Kopcha (2012) reports that a mentor can help teachers keep the vision of technology going and assist with teachers' perceptions of access to the technology, as well as keeping the technology working. Kopcha (2012) maintains that mentors help improve teacher beliefs in their own ability to create and implement lessons that integrate technology. Teachers then need to make the transition from having a mentor to being an active member of a professional learning community. Potter and Rockinson-Szapkiw (2012) affirm that administration needs to build professional learning communities in which teachers feel safe to take risks and try new teaching strategies. In his research, Kopcha (2012) discovered that when teachers transitioned from a mentor to a professional learning community, the teachers rated the barriers related to PD, time, and access lower than when they were working with the mentor.

Fang (2007) proposes a Performance-Based Faculty Development Model that includes five major components: formal training, communities of practice, performance support, formative evaluation, and knowledge sharing. This model moves away from strictly training to a model that includes training, motivation, and support.

Barriers to Technology Integration

Researchers have identified external and internal barriers in regards to technology integration. Hixon and Buckenmeyer (2009) and Ryan and Bagley (2015) conducted extensive research on external barriers, also known as first-order barriers, or those obstacles that are out of a teacher's control. For example, the amount of technology available at school, type of PD offered, the fact that technology is ever-changing, the quality of technology tools/internet access available, and limited or non-existent technology support, and limited time (Hixon & Buckenmeyer, 2009; Ryan & Bagley, 2015). According to Kopcha's research (2012), teachers consistently report that time is the biggest barrier. Kopcha (2012) clarifies that this was most likely due to the fact that integration requires planning, teaching, classroom management, and additional training.

Internal barriers, also known as second-order barriers, include teachers' personal beliefs about teaching and learning (Hixon & Buckenmeyer, 2009). Kim, Kim, Lee, Spector and Demeester (2013) found that teachers felt other teacher's attitudes and beliefs toward technology, as well as their own current levels of knowledge and skills, were the strongest barriers to technology integration. Ryan and Bagley (2015) stipulate that teachers with traditional teacher-centered beliefs typically use technology in a low level manner, whereas constructivist-thinking teachers tend to have high-level, student-centered teaching practices. Ryan and Bagley (2015) go on to conclude that reforming PD may be a potential answer to both external and internal barriers to technology integration. Although this reform will not improve the quantity or quality of the technology in classrooms, it can "help teachers improve their mastery of skills, offer continual support as technology continues to change, provide ways to create more rich student-centered learning opportunities, and boost teacher self-efficacy while lessening fears and anxiety associated with using technology in the classroom" (Ryan & Bagley, 2015, p. 39).

In summary, a review of the literature indicates technology is available in the classroom, but teachers struggle to integrate technology into classroom routines, processes, and instruction (Funkhouser & Mouza, 2013; Groff & Mouza, 2008; People for Education, 2014). Teachers primarily use technology for organizational purposes and low-level forms of instruction (Gray, Thomas & Lewis, 2010). Most researchers agree that PD is the key to getting teachers to use technology in high-level forms of instruction (Ryan & Bagley, 2015). The literature also indicates that traditional PD formats have little to no effect on assisting teachers to integrate technology effectively in the

classroom. Rather, a more individualized constructivist-based PD seems to be of benefit in getting teachers to integrate technology in the classroom (Fang, 2007; Kopcha, 2012; Potter & Rockinson-Szapkiw, 2012; Ryan & Bagley, 2014).

Methodology

In this study, surveys were used to collect quantitative and qualitative data from both teachers and administrators regarding their perceptions of technology-related professional development. Resulting data was compared in order to a) determine themes related to supporting effective technology through professional development, and to b) develop a subsequent quantitative survey to be sent only to teachers in a smaller focus group. The purpose of the second follow-up survey was to more accurately identify the ways administrators could support effective technology integration in the classroom.

Research Questions and Research Design

Ascertaining what teachers want and need from professional development related to technology integration could allow administrators to more effectively support technology integration in the classroom. The purpose for this mixed methods research project was to explore teachers' and administrators' perceptions of technology related professional developments.

The following questions guided the research:

1. What can school administrators do to support their teachers with technology integration in the classroom?
2. How do teachers want to learn about technology integration?
3. What are the barriers teachers may encounter when integrating technology?

The research design for this two-part study was an exploratory survey followed by a descriptive survey utilizing a mixed methods approach that included both qualitative and quantitative components..

Two surveys were used in part one of the study: one survey was provided to teachers and a separate survey was provided to administrators. The teacher survey began with three demographic identifying questions, followed by a Likert rating scale question on their personal perceptions of their effectiveness in using technology integration and concluded with six qualitative-based questions. The administrator survey began with two demographic identifying questions, followed by a Likert rating scale question on the administrators' perceptions of the teachers' effectiveness with technology integration and concluded with six qualitative-based questions. According to Leedy and Ormond (2013), a qualitative approach should be used when the research question is exploratory, which is the case in this study.

In part two of the study, an additional survey was developed from the data collected in the first two surveys. This third survey consisted of a short video informing the participants about the SAMR model, followed by a self-rated question about their current level on the SAMR model in regards to technology integration. The video portion was followed by two quantitative questions based on the answers the teachers and administrators gave in part one of the study. This quantitative-based survey was only given to a small focus group of teachers.

Population and Participants

The target population of the study was K – 8 teachers with access to technology in the classroom and K – 8 administrators. The participant pool used was purposeful as well as one of convenience, in that individuals who participated in this study were administrators and teachers in K-8 Catholic schools in the Archdiocese of Galveston-Houston. The list of schools and contact information was obtained through the Catholic Schools Office for the Archdiocesan of Galveston-Houston. Emails were sent out on May 20, 2015 to 50 administrators and they were asked to forward to their teachers. Seven administrators and 18 teachers responded to the survey.

Participant demographics were collected from the part one teacher survey relating to grade levels taught, years of experience, and their personal rating on a 1-5 Likert scale rating their ability to integrate technology in the classroom. Of the teachers surveyed, 33.3% taught Prekindergarten through 2nd grade, 33.3% taught 3rd-5th grade and 33.3% taught 6th-8th grade. The experience of the teachers ranged from 16.7% with 0 - 5 years of teaching experience, 16.7% with 6-10 years and 66.7% with 11+ years. Of the teachers surveyed, 16.7% rated themselves as a 5, which stands for the highest level of expertise with technology integration, 50% rated themselves as a 4, 33.3% rated themselves as a 3, 0% rated themselves as a 2 and 0% rated themselves as a 1, which stands for the lowest level of expertise with technology integration..

Participant demographics were collected from the part one administrator survey relating to experience and the expertise of the teachers on staff in regards to technology integration. The experience of the administrators ranged from 14.3% with 0 – 5 years experience, 28.6% with 6-10 years, and 57.1% with 11+ years. Of the administrators surveyed, 0% rated their teachers as a 5, which stands for the highest level of expertise with technology integration, 28.6% rated their teachers as a 4, 42.9% rated their teachers as a 3, 28.6% rated their teachers as a 2 and 0% rated their teachers as a 1, which stands for the lowest level of expertise with technology integration.

Participation in the part one surveys was voluntary and every administrator and teacher in the Archdiocese of Galveston-Houston PK-8th grade schools was given an opportunity to participate in the study. Each principal received an email, with a letter attached, explaining the purpose of the study along with a link to the teacher and administrator surveys. The principals were asked to forward the email on to all of their teachers and school administrators to complete. The surveys were sent on May 20, 2015 and the deadline for completion was June 1, 2015. A reminder email was sent two days before the window ended. Once the deadline passed, the researcher collected all of the responses and continued with data analysis of the first round of data.

For the part two, follow-up survey, a small focus group within the larger participant group formed the participant pool. Teachers who participated in this follow-up survey were from Christ the Redeemer Catholic School. The survey was sent to current teachers at the school as well as the teachers who had signed contracts for following year. This participant pool was also purposeful as well as one of convenience. It was purposeful because the teachers at this school were part of a new school that was also a 1:1 device school, so they were all in the beginning stages of implementing a technology-integrated curriculum. This group was a sample of convenience because this is the school where the researcher was employed. Emails with the follow-up survey were sent out on June 15, 2015 to 18 teachers. 15 teachers responded to the survey, giving a response rate of 83.3%.

Instrumentation and Data Collection Procedures

Instruments used in this mixed methods study consisted of surveys utilizing demographic

questions, Likert scale questions, and six open-ended questions for teachers or administrators. Open-ended survey questions were developed from a review of the literature and discussions with experts in the field. Each survey was accompanied by a cover letter explaining the purpose of the research, deadlines for completion, and assurances that all responses would be confidential and no identifying information would be asked in the surveys. Permissions were obtained from the Superintendent of the Archdiocese of Galveston-Houston.

All surveys were created using Google Forms Surveys software. In order to assure validity and reliability of the questions used in both surveys, part one surveys were piloted with a group of six individuals. During this pilot process, the researcher ensured the validity of each question, terminology of each question was easily understood, and responses would help to answer the research questions.

Once responses from the first surveys were coded and analyzed, collected data were used to develop the part two, follow-up survey for a smaller focus group of teachers. Permission for the follow-up survey was received from the principal of Christ The Redeemer Catholic School. The follow-up survey consisted of close-ended questions. The survey was sent on June 15, 2015 and the deadline for the completion was June 26, 2015. A reminder email was sent one day before the survey window ended. Once the deadline passed, the researcher collected all of the responses and continued with data analysis.

Treatment of Data/Data Analysis

Data for the part one surveys were recorded into Google Sheets. Percentages were compiled using the demographic information from the surveys along with the Likert scale survey questions. Responses to open-ended questions were compiled and sorted into possible themes or categories in order to get a sense of patterns or what the data might indicate (Leedy & Ormond, 2013). Once patterns and themes were identified, resulting information was used to create the part two follow-up survey questions.

Data from the part two, follow-up survey were recorded in a Google Sheet. Quantitative data were analyzed for averages and numerical relationships between certain responses on questions and responses to subsequent questions. For example, the percentage of teachers who rated themselves on a substitution level from the SAMR model was compared to the percentage who felt the best way to learn about a new technology was from a mentor.

Findings and Analysis of Data

The part one administrator survey asked administrators to define technology integration. Of the seven administrators who completed the survey, 71% included technology as a means to enhance curriculum and instruction, 43% included technology as a means to enhance student learning, and 14% only referenced the use of technology in their definition of technology integration. The next question asked administrators what they look for in regards to technology integration in the classroom. Of the respondents, 57% were looking for the use of technology in the lesson, 29% were looking to see if technology made the lesson more effective and engaging, and 14%, or one of the seven principals, was looking to see if the students are using the technology to create in order to meet the learning objective.

In the part one teacher survey, teachers were also asked to define technology integration. Of the 18 teachers who completed the survey, 28% included technology as a means to enhance curriculum and instruction, 28% included technology as a means to enhance student learning, and 44% only

referenced the use of technology in their definition of technology integration. The next question on the survey asked teachers to give examples of ways they integrate technology in the classroom. Of the respondents, 67% mentioned using the technology during the delivery of instruction, 11% mentioned students using technology for research, and 11% gave an example of students using technology to create work illustrating mastery of the learning objective.

Findings Related to Research Question One

Both part one and part two surveys examined three research questions. Research Question One explored how school administrators might support teachers with technology integration in the classroom.

Administrators' perceptions of supporting teachers. Three administrator survey questions were designed to elicit perceptions of how administrators were assisting teachers with technology integration in the classroom. One of these questions explored upcoming topics administrators planned on presenting to teachers in trainings on the topic of technology integration. Results showed that 71% plan on presenting on how to use technology in the school, 29% planned on presenting ideas that connect the technology to learning, and 14% did not know what would be presented because PD would be outsourced.

Another question examined how those topics would be presented to teachers. The most frequently mentioned way PD would be presented was by the administrator or technology specialist during a PD session at the school. 57% of respondents mentioned this method of delivery. 29% of administrators surveyed planned on outsourcing trainings, and 29% planned to use teachers who were already using technology to present professional development. 14% of administrators planned on sending teachers to a conference, and 14% planned on setting up collaborative learning communities on technology integration. None of the administrators mentioned a hands-on learning experience with technology, and none mentioned allowing teachers to complete independent studies.

Still another question specifically asked administrators to explain how they determined what teachers to include in professional development. As shown in Table 1, the majority of administrators planned on including all teachers, with 57% administrators reporting. In contrast, none of the responding administrators planned on creating an individualized path for professional development on technology integration.

Based on the research conducted, most administrators planned to conduct a professional development session for all teachers on how to use the technology that is in the school. Very few, if any, administrators planned to create an individualized learning path for teachers in regards to technology integration. According to the results, very little time is being spent on professional development related to connecting technology to learning.

Teachers' perceptions of how administrators support technology integration in the classroom. An initial survey and a follow-up survey were provided to teachers, in order to gather data on teachers' views on how administrators might support technology integration in the classroom. According to the part one teacher survey, data was gathered on what teachers want to learn about in regards to effective technology integration during professional development opportunities. Results showed that 17% of respondents wanted more information on how to use the technology in the school, 72% wanted more ideas that connect technology to learning, and 11% did not want to learn any more information about technology integration. Table 2 shows a comparison of teachers' perspectives and administrators' perspectives on topics being presented at technology-related professional development.

Another question in the part one teacher survey asked participants to identify ways in which

Table 1

Percentages of Administrators Differentiation of Technology-related Professional Development

Differentiation of PD	Percentage of Administrators Reporting	<i>n</i>
All teachers will participate	57.14	4
Stronger teachers will participate	14.29	1
Combination of all teachers and individualized professional development	28.57	2
Individualized professional development	0.00	0

Note. *n*=number of respondents.

administrators could support teachers with integrating technology in the classroom. One participant, or 6%, remarked that administrators needed to be more knowledgeable about the technology in order to support him/her more. Of the respondents, 17% stated they need administrators to provide more time, and 17% stated they would like to be given and/or watch more specific examples of technology being used in the classroom. 22% wanted more technology and resources, and 22% wanted more professional development, while 28% mentioned their administrators were doing a good job supporting them with technology integration and did not need anything else.

Table 2

Comparison of Administrator and Teacher Perceptions of Technology PD Topics

Technology PD Topics	Percentage of Administrators Reporting	Percentage of Teachers Reporting
How to use technology	71.43	16.67
Connect technology to learning	28.57	72.22
Unknown or no topics	14.29	11.11

The part two follow-up teacher survey sought to take the data collected from the part one surveys and develop questions to gather more focused data on how administrators might support teachers with effective technology integration in the classroom. Teachers were asked to identify two ways administrators or technology specialists could help with technology integration, specifically in regards to the SAMR model. Over 65% of teachers responding indicated hands-on learning experiences was one of the two ways in which they would prefer to learn about technology integration. More specifically, 66.7% requested administrators provide hands-on learning opportunities in which teachers could develop lessons with colleagues. 26.7% of respondents requested administrators provide time to specifically plan technology activities. Both having a technology specialist come into

the classroom to co-teach and providing more professional development during faculty meetings were requested by 26.7% of respondents. 20% of respondents asked that administrators help teachers come up with ideas/provide a list of suggestions or have students learn the technology skills needed during an enrichment class. No teachers selected Other as their response.

Table 3 shows the percentage of responses for ways in which administrators might support teachers with effective technology integration in regards to teachers' self-rated level on the SAMR model. More specifically, 2 of the 15, or 13%, of teachers rated themselves at the Substitution level of the SAMR model. 27% of the teachers rated themselves at the Augmentation level, 60% rated themselves at the Modification level and 0% rated themselves at the Redefinition level. 100% of the teachers on the Substitution level requested help coming up with ideas or provided a list of suggestions, 50% of the teachers on the Augmentation level requested this choice, and 0% of the teachers at the modification level requested this choice. 50% or more of all teachers at each level indicated that they would prefer hands-on experiences with the technology. No one at the Substitution level wanted more professional development at faculty meetings, but rather data indicated these teachers preferred hands-on learning and a technology specialist coming into the classroom to co-teach a lesson using technology. Time was the second greatest support requested by teachers working on the Modification level, but time was not a priority for those working at the Substitution and Augmentation level.

Table 3

Percentage of Teachers' Preferred Type of Support Based on Self-rated Level on the SAMR Model

Type of Support	Substitution	Augmentation	Modification	Redefinition
Provide hands-on learning opportunities where you can develop lessons with colleagues	50.00	50.00	66.67	0.00
Give time to specifically plan technology activities	0.00	0.00	33.34	0.00
Have a technology specialist come in and teach with you	50.00	25.00	22.22	0.00
Provide more professional development during faculty meetings	0.00	25.00	22.22	0.00
Help you come up with ideas, provide a list of suggestions	100.00	50.00	0.00	0.00
Have students learn the technology skills needed in an enrichment class	0.00	0.00	22.22	0.00
Other	0.00	0.00	0.00	0.00

Findings Related to Research Question Two

Research Question Two explored how teachers would prefer to learn about technology integration. According to responses gathered from the part one administrator survey, administrators planned to deliver most professional development during an administrator or technology specialist led session during a staff meeting. Administrators were least likely to organize collaborative learning communities, send teachers to conferences, provide hands-on learning experiences, or allow for independent studies. According to the data gathered from the part one teacher survey, 67% of teachers responding preferred a hands-on learning experience, 22% wanted to attend a conference, and 11% wanted to complete independent studies. Table 4 shows the comparison of teachers' perceptions and the administrators' perceptions in regards to how a teacher would prefer to learn about technology integration.

The part two, follow-up teacher survey provided responses regarding how teachers would prefer to have a hands-on learning experience in regards to technology integration professional development over other types of PD. Of the responding teachers, 53.3% selected teacher learning communities, in which teachers meet regularly to discuss what they are doing in the classroom with technology integration and then visiting other classrooms within their schools. Attending a technology conference was selected by 46.7%. Small group training, based on ability and technology knowledge desired, was selected by 40% of respondents, and 33.3% preferred having a presenter at a faculty meeting. Having a technology specialist come in the classroom and model a lesson was selected by 26.7%, and no teachers selected independent study or the category of Other.

Table 5 shows the percentage of teachers who chose each way they want professional development on technology integration to be taught based upon their self-rated level on the SAMR model.

Table 4

Comparison of Administrator and Teacher Perceptions of Preferred Types of Technology Integration PD

Types of Technology Integration PD	Percentage of Administrators Reporting	Percentage of Teachers Reporting
Faculty meeting/administrator led	57.14	0.00
Speakers/outsource	28.57	0.00
Teachers present	28.57	0.00
Conferences	14.29	22.22
Collaborative learning communities	14.29	0.00
Hands-on experiences	0.00	66.67
Independent study	0.00	11.11

Table 5

Percentage of Teachers Who Chose Each PD Type Based on a Self-rating on the SAMR Model

PD Type	Substitution	Augmentation	Modification	Redefinition
Teacher learning community-meet regularly discuss what doing in classroom and visit each other's classrooms	50.00	25.00	66.67	0.00
Small group based on ability and technology knowledge desired	50.00	50.00	33.33	0.00
Technology conference	0.00	50.00	33.33	0.00
Presenter at faculty meeting	0.00	25.00	33.33	0.00
Technology specialist come in the classroom and model lesson	100.00	0.00	22.22	0.00
Independent study	0.00	0.00	0.00	0.00
Other	0.00	0.00	0.00	0.00

Findings Related to Research Question Three

Research Question Three explored barriers or struggles teachers might encounter when integrating technology in the classroom. Administrators identified both teachers' fear or lack of understanding and more the need for additional professional development as the number one barrier or struggle with technology integration with 57% of the participants choosing each of those responses. For example, one administrator stated, "resistance by teachers who lack technology skills themselves." Another administrator stated, "They are afraid of it. They don't want to use it if they are not comfortable with it." Very few administrators saw students' proficiency or the amount/quality of resources as barriers to effective technology integration.

In contrast, 39% of responding teachers identified the amount/quality of resources as a barrier to technology integration in the classroom. Over a quarter of the respondents, or 28%, identified time as a barrier. For example, one teacher stated, "finding the time to sift through resources on the Internet to find things that are developmentally appropriate and relevant to what we are learning." Only a very few teachers, 6%, identified students as a barrier. No teachers reported not being willing to change or learn as a barrier, and none reported professional development as a barrier to effective technology integration. Table 6 provides a comparison of administrator and teacher perceptions regarding barriers to effective technology integration in the classroom.

Table 6

Comparison of Administrator and Teacher Perceptions of Barriers to Effective Technology Integration

Barrier or Struggle	Percentage of Administrators Reporting	Percentage of Teachers Reporting
Fear/lack of understanding	57.14	11.11
Not willing to change or learn	28.57	5.56
Time	42.86	27.78
Professional development	57.14	0.00
Money	28.57	16.67
Amount/quality of resources	14.29	38.89
Students	0.00	5.56

Discussion and Conclusions

Data from this study indicated that a majority of administrators (71%) referenced technology as a means to enhance curriculum and instruction, but in contrast, the majority of administrators (57%) are looking only for the use of technology when they visit classrooms. Teachers in this study referenced only the use of technology in their definition of technology integration 44% of the time and gave examples of the teacher using the technology during the delivery of the content 67% of the time. Despite administrators defining technology integration in terms of enhancing curriculum, instruction, and student learning, they were only looking for use of technology in classrooms, and in turn, the teachers were defining technology integration only in terms of the use of technology.

How do we get teachers' and administrators' ideas of technology integration to align with experts' definitions of technology integration and then support teachers in truly using technology to impact student learning? Additional follow-up survey questions were developed in order to find ways in which administrators could support their teachers with technology integration, to determine how teachers want to learn about technology integration, and barriers teachers might encounter related to technology integration.

How can school administrators support their teachers with technology integration in the classroom? Survey data indicated administrators planned on presenting how to use technology during a professional development session at the school to all teachers. In contrast, data indicated most teachers wanted more ideas that connect technology to learning during a hands-on learning opportunities where they can develop lessons with colleagues. Additionally teachers indicated they would like to meet in small learning communities. The part two follow-up teacher survey indicated that teachers who were just developing the use of technology, as indicated by their self-rating on the SAMR model (substitution, augmentation) wanted more direct instruction and ideas on connecting technology with learning. Teachers that were more advanced in technology integration wanted more collaborative learning experiences in which they could learn from each other. This supports Koh, Chai

and Tsai's (2013) research that contended that teachers need professional development that develops knowledge for both the technology itself and its pedagogical uses.

How do teachers want to learn about technology integration? Teachers indicated they preferred hands-on learning experiences when learning about technology integration. None of the teachers reported wanting to learn during faculty meetings during the first teacher survey and only a minority of teachers (33%) wanted a presenter at a faculty meeting during the follow-up survey as a means of professional development on technology integration. This data supports previous research in that Ryan and Bagley (2015) found delivering in a traditional lecture style of teaching with little time for active learning as a major weakness of professional development.

What are the barriers teachers encounter when integrating technology in the classroom? Data from administrators indicated teachers' fear and lack of understanding, professional development, and time as the biggest barriers to effective technology integration. Data from teachers indicated the amount and quality of resources, time, and money as the most common barriers to effective technology integration. Although teachers and administrators agreed on time as one of the biggest barriers, they differed on other barriers. Administrators identified teachers as more of a barrier and teachers identified resources as the bigger barrier.

In conclusion, administrators can support teachers by providing hands-on learning experiences that connect technology to learning. Additionally, depending on where the teacher falls along the continuum of effective technology integration, different needs should be addressed by professional development provided by the administration. Data from this study supports a more individualized or differentiated approach to professional development, in order for teachers to reach their full potential in technology integration.

Implications for Practice and Future Research Needs

Based on findings from this study, glaring differences exist between administrators' and teachers' perceptions of effective technology integration. First and foremost, there was a wide range of definitions of technology integration among the teachers and administrators and in turn there was probably a wide range of visions for technology integration that each administrator possessed for their schools. It would be beneficial for administrators to clearly articulate their vision and expectations for technology integration in their school to their teachers.

Second, it would be beneficial if administrators spent time understanding their faculty's knowledge level, needs, and desires for how to learn about technology integration, so administrators can more accurately align their professional development to meet the needs of their staff. This could be accomplished by surveying teachers, conducting classroom observations, or conducting interviews with staff members. Gathering this information would allow administrators to move away from traditional professional development formats to a more individualized constructivist-based approach that research indicates may have a positive effect on technology integration in the classroom (Fang, 2007; Kopcha, 2012; Potter & Rockinson-Szapkiw, 2012; Ryan & Bagley, 2014).

Finally, it may be beneficial for administrators to receive training in effective professional development. Based on findings from this study, teachers articulated the need for a more individualized, hands-on experience that allows them to collaborate with colleagues to gather ideas for the classroom. Training might assist administrators implement ongoing, individualized professional development experiences that are collaborative in nature. This may in turn lead to more successful technology integration at their schools (Potter & Rockinson-Szapkiw, 2012; Kopcha, 2012; Fang, 2007).

This study explored administrators' and teachers' perceptions of professional development related to technology integration. Future research should be conducted to include the quality of the professional development delivered to teachers. Additionally, more research should be conducted on the impact of implementing a professional development program based on the knowledge, needs and desires of a particular staff, and the impact professional development has on effective technology integration and ultimately student learning.

As teachers are expected to create a 21st century learning experience for students, administrators should be towards creating a 21st century learning experience for teachers. As data from this study indicates, administrators are called to develop a philosophy of professional learning that allows the individual needs of each teacher to be met. This philosophy should lead to differentiated professional development that can increase teachers' abilities to problem solve and to use critical thinking skills in order to apply their knowledge of technology and best pedagogical practices to create classrooms that utilize effective technology integration. Additionally, administrators should provide time for learning and create an atmosphere in which teachers can collaborate and take risks in order to further their learning on topic of technology integration. Finally administrators need to encourage creativity. Once administrators understand and implement needed changes in professional learning, teachers will be better supported in making improvements in technology integration within the classroom.

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