The Impact of Technological Professional Development Based on Teacher Need

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**Introduction**

Many teachers across the country face the daunting task of implementing technology without the proper training to implement the technology effectively in their classrooms. This is a study of the effect of technological professional development based on the needs of teachers. Approximately 18 middle school teachers from one school will be used for this study. All teachers will take a survey at the beginning of the school year to determine their technological needs. The leadership team will analyze the data from the survey to develop professional development opportunities for the teachers based on the areas of most need.

At the end of each professional development opportunity, teachers will be given exit surveys to measure the effect of the training. Some teachers will also be randomly chosen to write reflections about experience and the effectiveness of the training. The leadership team will also conduct walkthroughs into classrooms to further support the transition from the training to use in the classroom setting. A combination of the surveys, teacher reflections, and leadership team walkthroughs will be used to determine the effectiveness of the technological professional development.

The purpose of this study is to determine the impact of technological professional development that is based on the needs of the teachers. It is hypothesized that middle school teachers who received technological professional development based on their needs will develop more positive attitudes toward usage of technology. For the purpose of this study middle school teachers are defined as grades 6-8.

Technological professional development has been the focus of many studies for years. The studies used surveys, teacher reflections and other forms of support for teachers. In this
study, technology is defined as iPad usage in the classroom. The only way to further develop the teachers’ knowledge of this new tool is through professional development. Professional development is defined as a continuous process of lifelong learning and growth that begins early in life, continues through the undergraduate, pre-service experience, and extends through the in-service years (Loveland, 2012).

This year will be the second year the Central Middle will use iPads for instruction. In our district we are considered to be in the one-to-one program. The one-to-one program is defined as a school that instructs students entirely paperless, through the use of a device (iPad or laptop). This year the majority of our professional development on campus will be administered by the leadership team. The leadership team is made of administrators, a teacher coach, a district support person, and a team of teacher leaders on the campus. The job of the leadership team is to collectively make decisions that will impact the school and be a model for our school goal.

The leadership team at Central Middle School will conduct the study. As a teacher leader it is my job to create meaningful professional development for the teachers on the campus and support their needs throughout the learning process. The first step is to create a survey that encompasses technological needs through the district, some new technology and some older. Incorporating a variety of tools makes the survey open to cover the needs of various teachers, veterans and new teachers to the district. After the survey is complete, the leadership team will analyze the data to determine the needs of the teachers on the campus. After the data is analyzed and the needs determined, the leadership team will develop professional development opportunities that address the needs of the faculty. In turn, teachers will incorporate the newly learned technology skills in their classrooms, further impacting student engagement and student achievement.
Central Middle is located in Gonzales, Louisiana. Central serves grades sixth through eight and has a population of about 720 students. The teacher to student ratio is 25:1. The demographic makeup of the school is 64% Caucasian, 10% Hispanic, 23% African American, and 3% two races. The gender distribution is 49% boys and 51% girls. Forty-nine percent of the students at Central qualify for free or reduced lunch.

This will be the second year that Central will be a one-to-one school, using iPads for instruction. Last year, many teachers had just begun to explore the technology in their classrooms. The goal, as in most pilot programs, was to work out issues. This year, many new teachers have joined the Central Middle faculty, which means that the leadership team needs to provide professional development for these teachers to meet their needs as well. This often happens on campuses across the district, forcing leadership teams to set up professional development opportunities that meet the needs of the teachers and scaffold learning.

The school goal for Central this year is to increase student achievement by 3% based on our school performance score (SPS) that is released by the state. SPS is calculated using iLEAP and LEAP scores from that year and additional bonus points from high school courses are added to give the school a letter grade. Currently our school is a B school striving to become an A school. One of Central’s sub-goals is for teachers to utilize iPads for the instruction that will increase student achievement. In order for teachers to use the technology proficiently, the leadership team must provide professional development opportunities for teachers to explore and create lessons using the iPads. In order for this to be successful and for teachers to use the training, the leadership team must allow the teachers to have ownership in what kind of training they want to have. If teachers have ownership of their own learning, they are more likely to use
the new skills in their classrooms to impact student achievement and positively impact our school goal.

Many teachers at Central were very critical of the iPads last year because they felt that they didn’t get the professional development they needed to use the iPad successfully. This year, the leadership team will try to remedy this attitude by allowing teacher input through the use of surveys to identify the teachers’ needs. The barriers may include some of our veteran teachers feeling overwhelmed about using new technology in the classroom. One way the leadership team and staff could overcome this is to master one concept at a time to meet teachers where they are in the learning process. This will ease tension and fear of not being proficient or effective. The paradigm shift that will have to occur at Central is the attitude towards the iPads and the apathy towards change. Again, this can be addressed by the slow transition and the support offered by the leadership team and peers.

The risks that will be present through the implementation will be the attitude of veteran teachers and impact of student achievement. The attitude of teachers is a risk because if the teachers’ feel that they are not supported enough, they will not try to implement the technology in the classroom. Most of the teacher attitude of technology comes from teachers being overwhelmed and not having enough time to explore the new technology. The impact of student achievement is also risk because we really have no evidence that using technology in a classroom increases or decreases scores, leaving it open to question.

**Review of Literature**

Teachers around the nation and world participate in technological professional development throughout the year every year, but is it really making a difference with instruction
or student achievement? Professional development is a “continuous process of life, learning and growth that begins early in life, continuous through the undergraduate, pre-service experience and extends through the in-service years” (Loveland, 2012). In education, this means that throughout your career, professional development will help you improve your pedagogy to impact student achievement. According to Smolin and Lawless (2011), “technology has the potential to expand learning in ways that a traditional curriculum cannot.” This means teachers must incorporate technology in their lessons so that we can address high levels of student achievement. Technology can make it easy for the teacher to assess students and differentiate student lessons.

According to Pan and Franklin (2011), there is “a large gap between teachers and students regarding the adopting of computer technologies for personal use and school task. This gap must be bridged before computer technologies can be integrated successfully into classrooms.” Teachers are responsible for the continuous growth and new technological learning because education and students are changing everyday. This means that teacher growth and learning is continuous throughout the career of the teacher.

Many districts across the nation have been increasing technology budgets to keep up with the changing technology. According to Potter and Rockinson-Szapkiw, “Grand efforts and large budgets have been dedicated to purchasing new technology and training teachers how to use the new technology. Unfortunately, these efforts have often been short-sighted and only grazed the surface of meeting teachers’ needs to fully support technology embedded in classroom instructional practices.” Schools districts are wasting millions of educational dollars on technology that teachers do not use. This leaves many to question, is it because of the lack of support?
Many times, teachers do not get the support that they need to truly implement the newly learned technology, or they feel that they are not fully capable of making the technology work fluidly during the lesson and use it to improve student achievement. The lack of support is mostly because the professional development is “targeted only at operating equipment rather than instructional technique for integration” (Potter & Rockinson-Szapkiw, 2012). This type of training leaves educators with a lack of motivation and feeling like the technology is not relevant to student achievement, making the technology just extra bells and whistles. Furthermore, administrators and district leaders are back to square one trying to develop another plan to implement technology into the classroom efficiently and address student achievement.

Many of the technological challenges faced by educators are the comfort level and the fear of not addressing the students’ content needs while using technology for instruction. “It was found that the factors of technology professional development, attitude towards technology, and computer experience were significantly related to the secondary school teacher’s ability to use technology” (Mason, 2007). The teacher needs to feel confident that the technology he or she uses for instructional use will work and is relevant to instructional needs. In order to make professional development meaningful to teacher, it needs to be structured appropriately and try to address all of the teachers on campus needs.

According to Harris (2008), there are five goals when developing a relevant professional development: awareness of the tools and resources, curriculum integration, instructional techniques, school reform, and social change beyond the school. As stated previously, one of the biggest factors in technology implementation is the motivation of the teacher, meaning the teachers need to see the relevance of the technology. According to Harris (2008), “One of the keys to effective educational technology professional development design is to match models to
goals and both to participating teachers’ needs.” Again, teachers must see how the technology is relevant and needed for student achievement.

As earlier stated, learning and being able to apply technology takes time, meaning “learning would improve after the cognitive and the psychomotor learning and would take longer time to be established” (Bumen, 2012). This type of learning has to happen in stages, and teachers need support throughout the learning process. Administrators and district leaders must decide to set long-term goals when embedding new technology in the district. These long-term goals will help teachers “make increment gains” and “work toward transforming the nature of teaching and learning in the classroom” (Bauer et al., 2003). The transition of efficient use of technology is scaffolded, and trainings should be presented in chunks and support should be provided throughout the learning process.

Another way that teacher learning can be scaffolded and chunked is by having their peers involved in collaboration and being the trainers. “An advantage of local trainers is they know the situation our staff is in and can tailor the PD to their skills and needs” (Schrock, 2012). Local trainers are also an excellent way to motivate teachers because there could be teachers at their school who are using this type of technology, making it seem that it is possible that they learn how to implement it as well. Local trainers can also give teachers a sense of comfort because they are learning from their peers. One problem that could arise with local trainers is “limited PD with others outside of the district, which may inhibit the adoption of new ideas and practice” (Schrock, 2012). This could be an issue, but in order to address this, the district needs to have a reliable and up to date tech department that can release new technology to the districts.
Another importance of technology professional development is staying current in our society. The modernization of communication drives the world today and makes our modern world a global society. “Globalization is a major element in the 21st century economies, and its dependence of technology makes the role of computer-related technologies in education critical” (Mason, 2007). Not only is it important for the teacher to know for instructional purposes but for student achievement and success later in life. Computer skills are absolutely critical skills in the modern world.

“Today, American students are not only familiar with digital tools and devices, they often participate in the Web 2.0 environment in their personal life” (Pan & Franklin, 2011). Technology often seems the center of most young peoples social and learning world. This makes it more critical that technology should be integrated into current curricula in schools because technology knowledge is a real world job skill. Student long-term success and achievement is tied to technology skills. According to Martin et al (2010), “Professional development that makes an explicit connection between technology and specific types of instruction that have been shown to be effective can establish a viable chain of reasoning in which technology use can be linked to changes in student learning.” This means that the use of technology in the classroom can positively impact student achievement. Bumen (2012) stated, “The increase of technology usage ITP participant teachers was also transferred to the their students,” meaning that the skills that you model and teach in your classroom will be transferred into real life skills that students can use in the work force.

As stated earlier, if this educational change is to take place, teachers must feel supported throughout the process. A few ways to be supported through the process is through evaluations, collaboration and peer learning. According to Bumen (2012), “attitudes are being influenced by
the organizational context and it can be improved by social learning”. Through collaboration with peers, the learning process can be smoother because of the familiarity with your peers and because the teacher feels they are not alone. “Further, teacher-to-teacher mentoring can maintain sustained efforts, happen in real time and met specific needs” (Potter & Rockinson-Szapkiw, 2012).

Another important support system is administration. “Administrative support is also needed for the promotion and development of professional learning communities devoted to pedagogically sound technology integration in the classroom” (Potter & Rockinson-Szapkiw, 2012). According to Killion (2013), “For any professional development to add value, educators must received sustained, ongoing support”. Administrators must have a deep understanding of the technology for evaluation and how it impacts student achievement in order to continue supporting the teacher’s needs. Evaluation of teacher’s use of technology can be difficult because teachers need proper time to develop the skill. As previously stated, it takes time to master the new technology. Ham (2010) stated, “teacher professional development is too manifold and complex an intervention in teacher professional lives to be conducive to evaluation through simplistic, goals- outcomes correlations”. This leads administration and support staff to conduct multiple evaluations to measure improvement overtime and provide feedback and support to continue teacher growth and student achievement.

The benefits of implementing job embedded professional development are easy to understand. The most important benefit being, teacher time. Many teachers feel pressure to improve their technology knowledge but lack to the time to explore and become familiar. Another benefit is the continued support throughout the learning process. Many teachers feel that after the professional development they may need continued guidance and support to master
the new technology for instructional use. The final benefit is being trained by your peers. Many times this takes the pressure off of teachers and allows the learning process to happen naturally because teachers are more willing to share and support one another.

Methodology

Research Design

A concurrent, mixed methods design (QUANT+QUAL) will be used for this study. The quantitative component of the study will use the single group pre-test post-test design using a beginning and exit survey after each professional development opportunity. The independent variable will be the professional development. The dependent variable will be the attitude towards technology. Classroom observations and teacher reflections will be used to collect qualitative data.

Sampling

This study will utilize convenience sampling using the teachers on the campus. There will be approximately 18 teachers that vary with about 30 to 0 years teacher experience. The treatment group will consist of 18 teachers. Two percent of the treatment group will be male, and 98% will be female. Eighty-three percent will be Caucasian and 17% will be African American.
Instrumentation

For this study, several surveys will be developed by the leadership team and will be given as a pre-test and a post-test for each professional development opportunity. The surveys are designed to measure the teacher’s attitude and the effectiveness of the training. The test will consist of five to seven multiple-choice questions and a reflection question to gather additional evidence about the effectiveness of the training and the teacher attitude towards the technology. The post-surveys will be administered after each professional development opportunity, giving the leadership team several pieces of data after the professional development. These exit surveys can be used to measure the progress of professional development effectiveness throughout the learning process. Teacher reflections will be compared to the survey to ensure the content validity. The additional resources that will be needed are special programs or apps the teachers request and rooms set up with smart boards, projectors, and elmos to serve our technological needs.

Procedures

The teachers involved in the study will be selected from the same school. All teachers involved in the study will be required to obtain signed consent forms to participate in the study. The consent forms will include: the teacher’s name, grade they teacher, years of experience, race, and gender. This information is obtained for research purposes for the study.

Two grade levels of the school will be included in the treatment. All teachers will have the opportunity to take the survey to have their needs meet for professional development. This will also be a mandatory professional development. The professional development will be given during school hours on early dismissal days, so that teachers’ time will not be compromised.
Once the needs of the teachers have been determined, the leadership team will set up professional development opportunities in which teachers can choose the training they want to attend by setting up stations for the most popular needs. The professional development opportunities will take place on early dismissals during the 1st nine weeks and will be called “Tech Tuesdays”. At the end of the nine weeks, the teachers will take a survey and complete a reflection to determine the effectiveness of the professional development. Additional information necessary to carry out the action plan for professional development at Central will be the access to certain software and apps. To address this, the leadership team can research materials available to the district and ask that material be made available to our school. Some of the programs that could be presented will be our new testing software illuminate, blackboard for instructional use, differentiation with iPads, and formative assessments with iPads.

The goal throughout the entire professional development process will be to grow student achievement as a school. In order to develop a sense of community and a community of learning, the leadership team will use a survey to identify the needs of the teachers. Building a sense of communal learning and make the learning process flow smoother.

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<tr>
<th>Steps</th>
<th>Who Responsible</th>
<th>Timetable</th>
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<tbody>
<tr>
<td>1. Develop teacher needs survey</td>
<td>Leadership Team</td>
<td>Aug. 7-12</td>
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<tr>
<td>2. Teachers take survey</td>
<td>Teachers</td>
<td>Aug. 13-22</td>
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<tr>
<td>3. LT analyzes data from survey and develop 1st PD</td>
<td>Leadership Team</td>
<td>Aug. 25-29</td>
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<tr>
<td>4. 1st tech PD</td>
<td>Leadership Team &amp; Teachers</td>
<td>Sep. 11</td>
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<tr>
<td>5. Analyze results from exit survey, reflections and</td>
<td>Leadership Team</td>
<td>Sept. 15-26</td>
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The purpose of this study is to determine the impact of technological professional development that is based on the needs of the teachers. It is hypothesized that middle school teachers who received technological professional development based on their needs will develop more positive attitudes toward usage of technology.

Subjects

This study will utilize convenience sampling using the teachers on the campus. There will be approximately 18 teachers that vary with about 30 to 0 years teacher experience. The treatment group will consist of 18 teachers. Two percent of the treatment group will be male, and 98% will be female. Eighty-three percent will be Caucasian and 17% will be African American.

Discussion of Data

In order to support this hypothesis and research question, 18 teachers were given a survey at the beginning of the school year to determine their technological needs and areas they
Impact of Technological Professional Development

want to improve on for instructional purposes. The areas that were determined for teacher need was a software called Illuminate and Blackboard. It was determined by the survey that 80% of teachers needed support with Illuminate and 30% needed support with blackboard. Both of these tools are tools that teachers can use daily to support instruction in their classrooms.

After sitting down an analyzing the results, the leadership team determined that we needed to focus on illuminate during the early dismissal trainings and work on Blackboard need with the teachers who identified that as a need individually in professional learning communities and planning time because the highest need identified by the teachers was illuminate. As a leadership team, we decided to start with inputting questions into illuminate. The teachers were given a survey before the training that determined their level of knowledge coming into the training. This help the leadership team determine were the biggest areas of need were with this topic.

Due to the software being completely new, 43% of the teachers said in the survey that they did not feel confident at all using illuminate, 57% stated they were slightly confident. The survey also revealed that 42% of teachers could input questions into illuminate, 33% of teachers could not print bubble sheets, and 83% could not pull reports to analyze student data. Those teachers that were slightly ahead are teachers that explore and discover on their own time. These teachers tend to learn on their own and are self-starters.

After the training teachers were given an exit survey to determine the effect of the training on the teacher’s knowledge. The survey contained the same questions as the pre-survey before the training. The results revealed that 42% of teachers felt that could slightly use illuminate for instruction and 58% felt very confident in using illuminate for instruction, leave
none of the teachers to not feel confident at all. The survey also revealed that 100% of the teachers could input questions into illuminate and print bubble sheets. Additionally, 83% of teachers could pull student data reports to analyze student data.

After analyzing the results of the exit survey for the first training, the leadership team felt that many of the teachers had a grasp on inputting questions into illuminate. We knew there would be some teachers who needed additional support and we planned to us the help of professional learning communities to further support teacher need, we also encouraged exploration of the software. The next identified need was online testing. The reason this was identified as a need was because our district would be implementing our first district benchmark assessment completely online, to prepare students for state testing in the spring.

At the beginning of the training teachers were given a survey. The results of the survey concluded that only 15% of the teacher felt confident with online testing. During this training, the leadership team reviewed the important steps to online testing with Illuminate. Some steps included populating test with your students, pulling data after testing and printing pre-slugged bubble sheets. After the training was complete, the teachers took a post-survey that contained the same questions as on the pre-survey. The results revealed that 100% of teachers could populate test, pull data, and print pre-slugged bubble sheets.

After the second training session, the leadership team analyzed the results of the data and decided to give a post-survey about the entire Illuminate training to give us more information about the next phase of support. The survey included questions that reflected both sessions and the attitude of the teachers about Illuminate after the trainings. The results of the survey revealed that 94% of the teachers felt they were proficient in using Illuminate in their
classrooms. It also revealed that 73% of teachers felt they were proficient in inputting questions into illuminate. Additionally, it revealed that 94% of teachers felt proficient in pulling reports to analyze student data. The survey also revealed that 94% of teachers felt proficient in using Illuminate for online testing.

The teacher reflections revealed that most of the teachers felt that the trainings improved their knowledge of Illuminate. They also felt that support was available to them because the support was located on their campus. This helped them to feel motivated to use the technology because they knew if there were a question or issue, support would be given. The teacher reflections also revealed that one teacher in the sample felt that she was not given enough support and suggested that she needed more one-on-one support to feel confident and proficient.

**Discussion of Results**

Overall, the results of the survey showed significant growth of teachers in using illuminate. Most of the teachers can use illuminate proficiently in their classroom and feel confident that Illuminate is a tool that can help impact their instruction and further improve student achievement. Even though the survey results revealed high levels of growth, some teachers will need continuous support and will continue in their learning to improve instruction using technology in the classroom. The leadership team will give this support by conducting walkthroughs and giving feedback but also by professional community learning members who can support their peers. The process of embedding technological learning and improving those skills will continue to be a school focus with the help of teacher leaders on campus.
Conclusions and Implications

Introduction

It is hypothesized that middle school teachers who received technological professional development based on their needs will develop more positive attitudes toward usage of technology.

Conclusion

The study determined that professional development and follow-up support significantly impacts teacher attitude towards the new technology and improves teacher proficiency in using the new technology. Based on the pre-test/post-test survey information the researcher can conclude that the hypothesis is valid. The teacher reflections also help further prove that continuous support and follow-up with teachers improves teacher’s knowledge but also level of comfort using the technology.

In the field of education today, teachers must stay abreast of the new technology that is provided by our state and districts. This new technology can be a tool that helps us to identify needs of students and further impact instruction if used appropriately. However, teachers must be supported and trained using the new technology. It is not just enough to train the teachers and let them explore on their own. This does not work for all teachers and there is not such thing as a one size fits all training. Teachers, just like students; have individual needs that must be met to make them feel confident and proficient in using new technology. This is the job of the district and school to provide the training and the support to help teachers grow as educators.
In contrast, however, the reflections revealed that one teacher still did not feel confident or proficient, even after trainings and additional follow-up and support. The survey also helped pinpoint the teacher’s attitude because they feel they received the level of support she needed causing her to view using the technology negatively. This led the leadership team to identify certain teachers that need more one on one support, in the form of walkthroughs to give specific feedback and team teaching using the new technology. Based on the analysis of the final survey, our leadership team concluded that some teachers would need additional support and follow-up to improve confidence and proficiency. This will be done through the process of walkthroughs and the level of the support the teacher identifies he or she needs. Based upon the analysis of the final survey, reflections and additional support the teachers needed, one can conclude that the hypothesis that trainings and follow-up support improve teacher attitude is valid.

Implications

This study suggest that when teachers are given choices on what they learn, given training, and given follow-up support; it will impact their level of understanding and their attitude towards using the new technology. If teachers are given choice and additional support after training their level of motivation tends to improve, allowing them to embrace the technology and drive to use it for instruction.

Based on the data collected during this research, teachers became more motivated and confident if they feel leaders on campus support them. The training was effective but what made this research more effective was the follow-up and support the teachers received after the training. Teachers feel that if they can go to someone on their campus with questions, they have
a better chance at using the technology successfully and improving their skills. They also feel confident that if their skills are proficient they can use the tool effectively to improve student achievement. Teachers are more likely to use the tool if they feel that they can use the tool without having issues during instruction and if they have a support system on campus if something does go wrong.

Limitations of the study were not using the entire school population and not having enough time to conduct more walkthroughs for teacher support. If we would have used the entire school population and conducted more walkthroughs for specific teachers results of the final survey would have been different. Also the leadership team could have given the reflections throughout the research process to aid in identify the needs earlier to further impact teacher achievement, proficiency and attitude towards the technology.

As the review of literature suggest, follow-up support after professional development is critical for effective learning and level of comfort using the new technology. Further research should be conduct to identify the correlation professional learning communities and one on one teacher support. If a correlation is identified, more professional development should be designed to support professional learning communities in providing prescriptive support to its professional learning communities members to help further impact the teachers that need the additional support but more individualized.
References


