

*Developing Technological Capacity in EAL Learning Environments:
The Teacher Candidate Experience*

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Abstract

This project used action research to examine the experiences of pre-service teachers as they integrated learning technologies in an English as an Additional Language high school classroom. As both English as an Additional Language and technology application are underserved areas in teacher education programs it was believed that the opportunity to study the two together would be valuable. To learn more about initiating EAL and technology development sooner, a volunteer group from the University of Saskatchewan engaged in a program to create an educational technology experience in an EAL high school classroom. Participants recorded their experiences as they worked through developing a variety of teaching and organizational skills. Among the variety of outcomes, participants indicated that they found the experience to be helpful for their development and it is a learning opportunity that should be provided to pre-service teachers.

This action research project examined the experiences of teacher candidates integrating learning technologies in an English as an Additional Language environment. As part of an on-going project, this paper marks the initial effort to go beyond observing the process to share the impact from the teacher candidates' perspective. In this research volunteers from the College of Education at the University of Saskatchewan were invited to participate in a year-long project and share their experiences. In this paper we share the specific outcomes and challenges experienced by teacher candidates volunteering in an EAL high school classroom, using technology and developing multimedia to support students, as a form of action research. The potential of technology to support learning is well documented, but this project was unique because it engaged a traditionally underserved group of students. It is hoped the outcomes of this research will help prepare future teacher candidates to work with EAL students and use technology to enhance language and communication skills. The outcomes will also be useful for administrators and in-service teachers looking to improve their understanding of EAL and the

use of technology in the classroom. In this study the term *Teacher Candidates* (TC) is used to refer to students enrolled in the College of Education who are in their first year of study. It is similar to the term *pre-service teacher*.

Previous Research

The theoretical approach for this project was based on the ideas that an understanding of technology and English as an Additional Language must begin in Teacher Candidates' pre-service experiences (Smarkola, 2007), and that learning environments must be authentic to be valuable for Teacher Candidates (Wilson, 2010). The opportunities to integrate learning technologies to support teachers and learners are well documented (Bitter & Legacy, 2008; Borko, Whitcomb & Liston, 2009; Kazu & Yavulzalp, 2008). It is also widely accepted that technology skills are needed by all future teachers (Lever-Duffy & McDonald, 2011). Technical pedagogical content knowledge, or TPACK (Koehler & Mishra, 2008) is an example of a useful framework that can allow teachers to be more successful understanding technology. However, a significant issue related to understanding technology application is that teacher education programs struggle to provide effective technology focused professional development (Lever-Duffy & McDonald, 2011). Teacher education programs promote the integration of technology into the teacher education training (Albion, 2008; Bitter & Legacy, 2008; Guzman & Nussbaum, 2009) and in the school environment (Dawson, 2006), but developing acceptable levels of competency for technologies in students has been difficult. Both formal and anecdotal evidence, especially from students, highlight a lack of technology skills in teacher candidates (Angeli & Valanides, 2009). A significant issue according to Albion (2002) is that most candidates enter teacher education programs with poor levels of technological confidence or skills related to classroom instruction. Relying on faculty to model proper integration and application of technology is one potential solution that has proven to be inconsistent. Milman and Molebash (2008) suggest that once students have a chance to have formal technology training in their teacher education program they can improve their confidence levels in their application of technology, but there are no guarantees that faculty contribute to this success. Smarkola (2007) believes that rather than demonstrate to students in a post-secondary setting it is "necessary to provide university field placement initiatives to develop new approaches/models to support the integration of technology in the classroom" (p. 77). To address gaps in a teacher candidate's knowledge base technology training must include practical experiences where students are able

to be in regular contact with the learning situations in which they will be employed (Jefferson, 2009).

Similar to the case of technology, English as an Additional Language training is becoming more and more important for all classroom teachers not just those teaching in specialized programs (Mistry & Sood, 2010). Teacher education programs in countries such as England make EAL training a mandated part of their program but major issues still exist in Canada related to a lack of training for teachers working with EAL students (Cummins, Mirza & Stille, 2012). Specifically there exists a lack of resources and lack of practical teaching methods (Cajkler & Hall, 2009). With increased immigration bringing a variety of language speakers to Canada, EAL is an area in need of growth, especially in regions with traditionally low levels of immigration. EAL students, especially in high school, need exposure to technology (Sehlaoui, 2001) and will benefit from well-trained technology teachers. Becoming more aware of cultural differences in the classroom will make pre-service and in-service teachers better at looking after the needs of all their students, not just those with similar ethnic backgrounds (Townsend, 2002).

Generating an understanding of the changing needs of teachers of English as an Additional Language (EAL) in Saskatchewan schools is especially important because of a “266% increase in provincial immigration from 2000 to 2009” (*Saskatchewan Ministry of Advanced Education, Employment and Immigration*, 2009, p. 4). This rapid increase is continuing and is creating new opportunities and challenges for larger school divisions. In the Greater Saskatoon Catholic Division EAL numbers have increased from 276 in 2007 to 1,343 as of January 2013 (Menz, 2013). The Saskatoon Public School system is experiencing similar growth. In 2012, students requiring English as an Additional Language programming rose by more than 400 students (Star Phoenix, 2012). A key factor driving the research is the belief that developing an understanding of EAL will help Teacher Candidates before they enter the rapidly changing classrooms of the future.

Working with high school students in an EAL setting to increase their exposure to technology is an area of growth but researchers need to increase their research intensity in this area. Zammit (2011, 2013) looked at case studies of technology use to increase student engagement in low-income secondary school students. Hammett (2013) engaged in an action research project with ninth grade students successfully using digital storytelling to recreate their understanding of Shakespeare’s *Romeo and Juliet*. Degenais, Fodor, Schulze, and Toohey (2013)

demonstrated the power of technology in the classroom when they examined how the process of video making can be part of learning language. They see potential in examining interaction with objects as well as people as part of the language learning process.

Efforts to increase integration of technology are promising and show potential to be applied to an EAL setting but it is just a beginning and there needs to be a wider analysis of how these successful strategies can be migrated to EAL programming. Providing diversity and giving EAL students an opportunity to share who they are can happen through the interaction with and creation of novel and non-traditional artifacts such as “Identity Texts” (Cummins & Early, 2011). More investigation of the potential for identity texts is needed. Developing and delivering the learning in an authentic EAL environment is also important (Wilson, 2010). Simulated learning environments can only advance the pre-service teacher’s knowledge and skills so far. Combining technology and EAL instruction with actual students in a high school, teacher candidates are able to experience a highly authentic learning situation. There are many opportunities to take existing technology strategies into EAL classrooms. The potential for supporting EAL students using technology in this manner is one of the driving forces behind this project.

Background

In the fall of 2012 a request was sent to all (340) students entering their first year in the College of Education at the University of Saskatchewan inviting them to participate in a technology-based action research project. From this initial contact a group of four first-year teacher candidates was selected to develop their technology skills in an EAL context. The project required students to meet as a group to share ideas about how to use technology in an authentic learning environment. The approach included developing project management skills, trying to make a positive social impact, and utilizing scaffolding during the learning process (Wilson & Schwier, 2009). It was believed that an authentic learning situation would assist teacher candidates to develop a more comprehensive understanding of teaching with technology and EAL instruction.

For all participants working in an EAL classroom was a brand new experience. There was a wide range of technical knowledge in the group, from those who had very little technology experience to one member with a computer science background. Initially all of the participants were a bit uneasy entering this type of technology-rich work. There was no prerequisite for

participating but three of the four were registered in Educational Technology and Design elective courses. These extra technology courses provided more possibilities for using different technology in the classroom.

Setting

To undertake the proposed project a partnership was arranged with the Saskatoon Public School System. The setting for the research was Walter Murray Collegiate, one of the largest schools in Saskatoon. The school population included over 1500 students and approximately 90 staff. The school is unique, as it offers a diverse range of programs such as advanced and modified academic programs, trades such as cooking, automotive, woodworking, languages, EAL, and fine arts. Although each teacher is provided with a laptop and projector, technology for students in the school is limited, only served by two computer labs, and a computer based learning resource center in the library. The chosen EAL classroom had four older desktop computers and one newly acquired iPad. The EAL teacher recognized that opportunities to use technology more effectively exist, but at the time was unable or unsure how technology could be integrated into her classroom.

Students

The host class selected for this project was one of the three EAL classrooms that each serve approximately 25 students yearly. The students participate in other aspects of the school, but spend significant portions of their day in the EAL classroom setting. These high school students fell under three categories: immigrant, refugee, or foreign exchange student. Due to the diverse backgrounds there was a wide range of literacy and learning styles amongst the students as well as significant socioeconomic gaps. Some of the students were coming to the school directly from refugee camps. Many of the high school students had limited educational experience and some had no formal education. As a result, the behaviours and procedures of a Canadian school environment were brand new for most of these students. These challenges were compounded by immersion in a new language and culture outside of the school.

In the EAL classroom most of the exposure to technology was through the use of the Internet and a few EAL/ESL specific software packages. A significant number of these students had little or no experience with technologies such as cameras, laptop computers or tablets, or programs for creating content. There were no technology training programs for the students so they had little opportunity to create their own technology content. For these and other reasons

they had limited exposure to technology and many would not otherwise have had access to these devices.

Students in the EAL classroom represented the countries of Iraq, Pakistan, India, El Salvador, and Sudan in the first term with the addition of students representing Bangladesh, Vietnam, China, Philippines, and Moldova in the second term.

Process

The start-up phase of the project consisted of three coordinating meetings to outline the process and plan for the year. During these meetings a visitation schedule was determined for the first semester. All visits to the classroom were arranged through the classroom teacher. The TCs were expected to attend other student teaching commitments so this project meant even more time devoted to non-course based activities. To make coordinating easier, two of the TCs were able to substitute time in the EAL classroom for other student teaching commitments.

Three of the four participating TCs were secondary education majors, so EAL training was not part of their repertoire. Most had used everyday technology communication tools, word processing, and the Internet but they had not specifically applied technology in a teaching setting. They were not expected to be experts in EAL or have a strong technology background and although initially they did not know about the classroom they would be working in, the TCs did not shy away from the EAL experience. For most it was an opportunity to work with, and learn from, students from countries they knew very little about. The classroom direction was based on the needs of the teacher and the high school students. As the TCs were expected to share and contribute to the project an overview of action research in education (McNiff & Whitehead, 2011) was shared with the students. To further develop their understanding of the process they attended a local research conference to expose them to the concepts and application of action research. Engaging the participants in the understanding of the action research process was meant to help them to better reflect on and articulate what they were doing.

Before working with the high school students, the EAL teacher met with the volunteers to talk about what to expect in the classroom. A key concept was the importance of creating an environment of trust. To do so, the teacher candidates spent the first few visits observing and getting to know the students. It was hoped that beginning slowly would help the students become comfortable with the situation. These initial visits also assisted teacher candidates in looking for ways to apply technologies to the learning process. As the term progressed the TCs would visit

the classroom individually or in pairs to work with the students. The visits would be once or twice a week for a morning or afternoon. The TCs looked for opportunities to use technology to support the courses the students were working on as well as introduced new activities. The development of the technology skills was *scaffolded* (Hogan, & Pressley, 1997). That is, students would learn the basics of a program or piece of technology, and then, when they were comfortable using it, new information about it would be shared and then mastered.

Due to a lack of technology in the participating classroom, equipment (two Mac Book Pro laptop computers, four iPads, and four Canon digital cameras) was provided by the researcher and time was spent becoming comfortable with the specific devices. This equipment was stored in a communal locker at the university where everyone had access to what they needed on their scheduled visit. The common access point for the technology meant that there was much needed continuity on the projects.

Throughout the first term, feedback was gathered from the TCs on the initial direction of the program. As the TCs had a good understanding of the learning environment visits were based on working towards a particular learning goal, not just working on a project with whoever might be present. As a result of the deeper classroom understanding, a revised visitation schedule was put into place for the second term. Students began to develop skills and confidence, so they were able to continue working on the days the TCs were not present. This change made the process much more efficient and effective. Each week small groups worked on a combination of language websites, audio production, and video production focused on EAL and other subject areas. The teacher candidates continued to meet periodically to share amongst themselves and with the principal researcher. During these times students talked about the successes and challenges. As they were busy and were unable to meet outside of these times it was a valuable opportunity to gauge their combined progress. They also took advantage of an opportunity to share with a broader educational audience. A presentation proposal was submitted and accepted for a Canadian conference on teaching and learning technologies. This process helped the students to look back on what they had achieved, and to celebrate their efforts and the success of the students. The TC visits to the school continued until the end of the university second term when the expectation for their involvement was met.

What was Learned

Overall, the TCs felt that many of the strategies and technologies they used worked well and benefitted the students. There were many successes from both technical as well as practical perspectives. They shared the implementation of the specific tools they used to give the reader a sense of what was working and how it worked. The following section will outline the specific classroom initiatives and outcomes as identified by the participants.

Technology

The first tool introduced to the students was Photo Story (Version 2.0, 2013). It is a program that allows students to combine images and narration to create a multimedia story. This program helped students to share their own experiences using technology that they were most familiar with, namely the desktop PCs in the classroom. As part of this first step the students worked on writing and pronunciation through the creation of scripts to accompany the images. Using Photo Story, students took their classmates on virtual tours of their home countries and shared important events from their past. For some students it allowed them to share difficult experiences in a way that made them feel protected. One project in particular became useful for all new students learning to navigate the new school via a photo story about the various parts of the building.

Students created PowerPoint presentations and delivered them to each other in the classroom. The presentations were based on showcasing items of clothing from their countries of origin, favorite activities, and hobbies. Students were encouraged to share in all three categories to give others in the classroom a chance to learn about them. PowerPoint was an effective way to engage the students in using English. As what they were making would be shared with their classmates, they took extra time to complete the work, paying more attention to correct grammar and spelling. Most of what they did was text on screen composition which helped them expand on their literacy experiences. Web-based translation tools were available on desktops, iPads, and student phones and was used by both teachers and students. The service was especially helpful for students with limited English vocabulary levels. It also allowed first language text to be displayed for students.

Once the students had achieved success at creating and sharing some of their personal history the group moved onto video production using iMovie. This next stage marked the transition into the most successful integration of technology. Video production became a main

method of developing trust and communication between the students and the TCs. The high definition cameras and iPads were used to capture images and the laptops, and iPods were used to edit the footage. Using the equipment from the researcher, the high school students created a variety of videos including school tours, class trips, and movie trailers. The built-in templates worked well, as they gave the students creative options without having to master complex design tasks. These templates were flashy, and included music, making them an easy starting point. The software also facilitated the creation of attention grabbing presentations with the use of transitions, music, voiceovers etc.

Student projects included sharing their talents both in and out of school. Events such as a performance by a school drumming group were captured, edited and shared with the students. Videos were shared with the entire school during world culture day. One student who was an extremely shy student changed completely once he had a camera in his hands. It allowed him to feel good about himself and share his ideas when finding the right words was too much. A student who was an aspiring artist took footage at home in his studio and used it in his school project. Other students took copies of their videos home to share with their families. These were proud moments for the students that generated a boost to their self-esteem and created enhanced levels of confidence.

Teaching Practice

From a pedagogical point of view the opportunity for engagement with technology was well received by every student. This particular class was relatively small, which allowed for a high degree of one on one instruction. TCs were able to spend time observing and working with students as they composed text to use for Photo Story and PowerPoint. The process provided many opportunities for corrections, discussions on work in progress, and as a means of assessment for learning (AFL). As an example, when students were using PPT projects, they would present their work first in pairs, then in small groups and finally to the entire class. In terms of EAL goals, the project covered writing, reading, listening, and speaking. The technology literacy provided by exposing them to iPads, laptop, cameras, associated software and techniques improved students literacy and further aided with integration into their new Canadian surroundings and peer groups.

The technologies utilized in the project provided students with the opportunity to be successful for a number of reasons. Choosing free web-based programs or low cost iPad apps to

use with the students ensured multiple copies could be acquired. Technologies were selected based on their ability to be modified easily and adapted to projects on an individual student basis. Individual projects were tailored to suit the level of the particular student. Student skills in technology and new media (video/audio) literacy improved at a very rapid rate. The students were allowed the freedom to explore and express their identity using content with which they felt comfortable. By the mid point of the first term some of the high school students were teaching the TCs extended applications of the tools.

As new skills became working knowledge, broader learning occurred. Students became more confident accessing unfamiliar tools or locating and applying online resources. This increase in ability led to a greater level of technology familiarity and raised the students' confidence level with technologies. When new students joined the classroom throughout the year, it provided peer teaching opportunities for those who had previously learned the technology. It was an opportunity to bring new classmates up to speed quickly. A pairing would be arranged with a more experienced classroom member. The experienced student would observe the new student, and then assist when the new student needed help. There was a great benefit to the diversity in this particular classroom. It meant there was often another student of the same language group for new students that could be used for pairing to help with initial introduction to the school and classroom.

An issue in the beginning was the high school students' lack of familiarity with computers. Some of the students were raised in refugee camps and had little exposure to computers and the Internet. Others had access to phones that they used to text, access translation programs, watch videos on YouTube, and access Facebook as a way of connecting to their home countries. They did not have an understanding of how to legally use material from the Internet. The TCs implemented strategies to create a better understanding of intellectual property and copyright, and introduced students to the idea of digital citizenship. Dealing with digital citizenship issue began with encouraging student use of copyright free images. They were shown websites where information could be used for free. Students were also taught why it was important to give proper attribution of audio/video work. Many students were not able to assess the validity of online content so time was spent reviewing the resources that were used in the work they were doing.

Challenges

The project was not without its challenges. The first was a common issue for technology-supported learning environments: there was a need for a greater number of technology devices in the classroom. The inability to provide a 1:1 ratio of devices for students was manageable to begin the project, but became an issue in the second semester when the number of students increased. The much larger class size made the approach to individual technology use less feasible in the second term. There was not enough hardware for each of the students to access the machines. TCs were faced with a situation where students simply did not receive equal access time to the devices and everyone found this frustrating.

Second, the presence of the technology in the classroom often became a distraction. The students experienced success using the new tools and skills and when other work needed to be done students would often make an attempt to use the technology when it was not appropriate. Also, students using technology for one task occasionally became off task and ended up on social media or video sites. Although technology distractions diminished for most students over the course of the term, the TCs and teacher had to monitor some students to ensure they were staying on task in the app/application being used. The TCs felt that the distractions may have been a new teacher issue more than anything else and that they would improve at keeping students better on task in the future. The counterpoint to the distraction was that as pre-service teachers these new devices also gave them an unfair advantage when they were in the classroom. They were not standing in the front of a class lecturing about proper English sentence structure, but rather they were bringing in both tools and projects that the students absolutely loved working on. The EAL students were always “champing at the bit” to do technology supported work. The high degree of student motivation made it easy to quickly develop relationships with each of the students and in turn raised their productivity.

There was plenty of time spent managing data storage and workflow. These issues were caused by bringing in technology that was not connected to the school network. The security policy of the school board meant that the outside Mac laptops were not able to connect to the Internet. The students were able to access through the iPads but not at first. As the MacBook Pro computers and iPads were much better than those already in the classroom environment they were always the first choice for the EAL students. This meant that often video captured had to be reformatted to work with the PCs and countless extra hours were spent on this task. Also, when it

came time to transfer data the TCs had some difficulty communicating between tablet devices. For example when the video or photos were on one iPad, how could a student make a movie using this stock photo/footage on another tablet device? At first USB drives were tried, but the files were too large. To further address the issue of access the file-sharing program Dropbox (Version 2.3.2, 2013) was used. It worked as a temporary solution but not ideal as a long-term solution.

Teacher Candidates Outcomes

At the end of the school year the student teachers were surveyed to determine how they were impacted by the experience. They were asked to respond to the following specific questions:

- What were your expectations or goals for participating in the technology group program?
Were these goals met?
- In what areas of technology have you developed a better understanding?
- Has your confidence with using technology increased or decreased?
- What has been the impact on you as a developing teacher from participating in this program?
- What would you say the impact has been on the EAL students?

The following section includes selected quotes drawn from their responses.

When asked about their goals in volunteering for the group, they had some general ideas but viewed it as more of an opportunity to explore areas about which they knew little.

Rewarding experience to see/work in EAL as this is a reality for almost every Canadian teacher entering or in the field today.

My primary goals for participating in the ETG participating in school based work opportunities/contact time that would allow me to leverage what I consider to be a personal strength.

I have had a long standing attraction to new technologies. I have also spent a number of years working in a tech-heavy field and was happy and fortunate to be able to find such a close match in the form of the ETG.

My expectations were rather limited at the outset. I hoped I would gain some experience in a classroom with high school learners.

My hope was that the experience would help provide some early affirmation in terms of career choice, as well as provide some classroom experience to aid my future practice and CV. The form and function of the program was well laid out from the beginning.

All TCs felt that their expectations were met and generated a desire to continue to learn more about both EAL and technology. Their skills in video production improved and their knowledge of Mac products increased.

Bring video recording and processing/editing devices into a school, and put it into the hands of EAL students. This is what we did and basically sat back and watched the magic happen.

Importance of device: student ratios in limiting OR extending the type of work that can practically be accomplished in such a classroom.

[We were able to explore the] limitations AND strengths of various types of hardware and OS/platforms in terms of video prod[uction] and post-production.

The impact of technology in speeding or slowing various stages in the video production process (compatibility between recording device output and video processing software was an issue at times, as was video processing time during import and export of raw and finished video (respectively)).

I would say my understanding of Apple products has increased. I think it also made me more aware of some of the benefits and challenges regarding using

technology in a classroom setting.

All participants reported an increase in their confidence. Those who were already confident in some technology areas reported growth in other areas and greater confidence in their understanding of applying EAL in their teaching.

My tech-confidence has increased moderately. As I mentioned above, I have a good deal of tech experience from a previous career, however, I did not have a lot of exposure to the video recording/processing aspect prior to this project.

At the conclusion of my work with the project I have a lot of experience, and a good number of concrete examples on how I can draw on the strengths of using this technology with EAL (and any really) students in my future practice.

My confidence with technology definitely increased.

They shared specific areas where the experience changed them as future teachers.

Extensive experience with EAL students (which is where I would like to teach eventually).

Warm and rich experience working with a practicing teacher who was interested in helping develop EAL and classroom skills in a newly minted teacher candidate.

Practice in implementing tech rich lessons and projects with EAL students.

The biggest impact came from working with the students. You get exposed to a large variety of cultures from every corner of the world and you can't get an experience like that anywhere. The students really blew my expectations out of the water with their willingness to learn and rapid improvement at everything we did.

The TCs felt that the impact on the high school students was positive. They noticed improvement in learning English skills and an increase in literacy. There were observed increases in technology literacy levels, and the creation of new knowledge, new friends, and more confidence (in English usage and with technology). The degree of positive impact was felt to be unique to this set of EAL learners.

They take skills and experience forward that will benefit them immediately in day to day life and later as they leave this school

I would say that they were beginning to gain some self-confidence due to the technology. Actually producing videos gave them a sense of achievement which just led to more success the next time they worked on it

There were many examples of individuals becoming engaged and a part of the school as a result of the program.

Conclusion

The initial motivation for studying this group was to determine how they would work with technology in an EAL classroom. It was an excellent opportunity to hear first hand from the teacher candidates. Exploring the practical features of what they shared helped to understand the real opportunities as opposed to only the theoretical ones.

The participants viewed the overall process as a success. The TCs and the EAL students received benefits from all aspects of the project. The TCs became more skilled at applying technology in the classroom, they reported an increase in confidence in understanding the EAL learning environment and developed as beginning teachers. They successfully applied a scaffolding approach to using the technology, beginning with the technology with which the students were comfortable and then moving to more complex tasks. They carefully chose applications and apps that were flexible and could support learners at any stage of their learning development. Assisting the EAL students in sharing their stories helped them to create an identity within the class. The overall experience made the TCs feel as though they had become better teachers with more skills and more confidence. The high school students acquired a variety of technology skills, had opportunities to share information about themselves, improved

their confidence, and appeared to become more comfortable in the wider school environment. There were some issues around access to technology and the school's network but these are problems with potential solutions.

In terms of future research there is a need to continue to study the impact of the ETG on teacher candidates. As more devices become available in the school it will also be beneficial to examine how more individual time with the tools impacts EAL learners. There is also an opportunity for other researchers to study the impact of the increased use of technology on the academic success of EAL students.

In summary this small group of university students was able to bring technology to an EAL classroom with positive results. Using limited resources and volunteer time they improved the learning experience of the students and increased their own skills and confidence. The TCs suggest that what was happening in this one classroom would prove beneficial not only for young students in high school but also in elementary, and could be used to help any new Canadians adapt to challenges in their new country.

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