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How Well Are ESL Teachers Being Prepared to Integrate Technology in Their Classrooms?

Nancy Velazquez-Torres
Metropolitan College of New York
<NvtowerV@aol.com>

Abstract

This article reports on the experiences of language teachers with their teacher preparation in the use of learning technologies in Puerto Rico. Three focus group interviews were held with 28 pre-service teachers; 9 in-service teachers were interviewed, and a post focus group interview was held with student teachers after they completed their field teaching experience.

The following themes emerged during the analysis of the qualitative data: (a) Course Content must be more than learning to use a program or machine in order for a teacher to be prepared to integrate technology in the classroom; (b) Modeling technology use by teacher educators and cooperating teachers instructs by example, (c) Self-acquisition of technology skills needs to be supplemented by formal training for teachers to acquire the technology skills they need; (d) Access and exposure to technology and Internet needs to be expanded; (e) Practical integration of technology in language teaching requires hands-on-experience throughout the teacher preparation program.

Based on the findings, recommendations are made to higher education institutions and school administrators in Puerto Rico to face the challenge of preparing language educators in the integration of learning technologies in their curriculum.

Introduction and Purpose

Although research reports on the numerous advantages of technology-based instruction for language learning (Wiburg & Butler-Pascoe, 2002; Warschauer & Kern, 2000), many TESOL programs still lack adequate integration of learning technologies into their

curricula. Teachers are not receiving sufficient-instruction or practice in the integration of learning technologies into their courses (Kavanaugh-Brown, 1998; Symonds, 2000). As a result, language teachers are faced with the challenge of using technology successfully without proper preparation.

Teacher education in learning technologies is essential for teachers to realize technology's full potential in language learning and teaching. However, if one looks at course offerings and course descriptions within TESOL programs, especially undergraduate, it is evident that few model the use of the emerging technologies for ESL instruction. Numerous studies (The Milken Exchange and ISTE, 1999; Web-based Education Commission, 2000; CEO Forum on Education and Technology, 2001) have reported that schools of education are not providing the kind of experiences teachers need to integrate technology in their courses.

These organizations recommend continuous and relevant instruction and support for educators and administrators at all levels. Furthermore, they encourage states to develop standards for teacher technology preparation and require candidates for teaching positions to demonstrate their technology skills. For instance, The Technology Performance Profiles for Teacher Preparation (NETS, 2003) developed by the International Society for Technology in Education (ISTE) suggest ways programs can incrementally provide learning experiences that will help prospective teachers meet the standards.

In order to provide a better understanding of teachers' preparation in the integration of learning technologies to enhance language learning, this qualitative study documents ESL teachers' perceptions, attitudes and experiences with their training in the use of learning technologies. The researcher conducted focus groups, and individual interviews with pre-service and in-service ESL teachers. Since very little research has been conducted on this issue in Puerto Rico, the study focused on Puerto Rican language teachers' experiences with learning technologies within their teacher preparation programs.

Puerto Rico, a commonwealth of the United States, is required to teach English as a second language (ESL). However, less than 30% of the population is bilingual (Caballero, Cole, Guiñals, López, Meléndez & Molina, 2001). According to Project for the Development of a Bilingual Citizen (1997), 90% of Puerto Ricans cannot communicate effectively in English and 81% of students in Puerto Rico's public school system have not developed the English language skills required to communicate orally or in writing. Recently, an increased emphasis by Puerto Rico's Department of Education on strengthening the teaching of English in the island has been noticeable. New certification requirements, more in-service training, the use of different methodologies based on cognitive-humanistic learning, and the use of technology in education have been among the many projects undertaken (Albino, 1998). However, although the Office of Information Systems and School Technology was created to

integrate technology in education, as of today, the use of learning technologies in teaching in Puerto Rico is very limited (Ghigliotty, 2002).

This study documents how prepared Puerto Rican ESL teachers feel to use technology for ESL instruction. Besides supporting previous research that points out the lack of teachers' skills in the use of emerging learning technologies, this study revealed that although many ESL teachers in Puerto Rico do not feel prepared to integrate technology in their classes, some are being innovative and creative against all odds. On the other hand, others are not even trying. Furthermore, recommendations are made to teacher education programs, teacher educators and school administrators on ways to improve teacher training in learning technologies and ESL instruction.

Theoretical Framework

Despite the use of technology in different forms for language instruction for many years, it has been in recent years that educators have become aware of the potential of emerging technologies in language classrooms (Singhal, 1997; Wiburg & Butler-Pascoe, 2002). Research supports the effectiveness of technology-based instruction for language learning (Muehleisen, 1997; Warschauer & Kern, 2000). However, the need for increased technology education for teachers is still evident (CEO Forum on Education and Technology, 2001). Although national and state standards (NCATE, 2001) require teachers to integrate technology into their teaching, the National Center for Education Statistics (2002), reports that only 27% of in-service teachers feel well enough prepared to integrate educational technology into their courses.

In Puerto Rico, teachers are required to complete a teacher preparation program, have a semester of student teaching, and pass several exams; however, they are not required to demonstrate technological competencies. Less than 20% of the teachers integrate technology into their classrooms, and although laptop computers were distributed to most public school teachers, 75% of the teachers do not use them because they lack the necessary skills (Ghigliotty, 2002).

Prospective teachers must have adequate understanding of and confidence in various technologies, when and how to use them effectively for instructional purposes and how to assess their use (Dooling & Case, 1997). Teacher training institutions must ensure that language teachers are prepared to teach language with as many forms and uses of technology as possible (Machado, 1997). They must realize computer skills do not necessarily translate into effective integration of technology in the classroom. Pre-service teachers must have opportunities to practice planning and using technology in instruction (Jacobsen, Clifford & Friesen, 2002).

Programs like the University of Minnesota's Teacher Development Project, designed specifically to provide technology training that addresses the concerns of language teachers, should be duplicated (National Language Research Center, 1999). In this

innovative endeavor, groups of students in the teacher preparation programs were combined with several cooperating teachers from the local area for the application and demonstration of multimedia language materials and the Internet for developing language skills, incorporating authentic language and enhancing interaction in the second language classroom. The goal of the program is to help all of the teachers learn to use the tools, evaluate the materials critically, and select and use the technologies.

According to the NLRC (1999), using these the new technologies can: (a) enrich and enliven foreign language courses, (b) provide greater diversification of learning activities, (c) accommodate different learning and teaching styles, (d) effectively motivate students who live in a technologically developed society, (e) offer students additional guidance and practice, and (f) involve students in foreign language environments without having to leave their regular classrooms.

For instance, language educators agree the best way to learn a language is through real interaction with others using real language in real communication situations (Wiburg & Butler-Pascoe, 2002). Therefore, the use of the Internet in language classes offers a more practical real life language experience. It provides students with functional communicative experiences that serve the learners need and motivate them to use English in their daily lives (LeLoup & Ponterio, 1997; Muehleisen, 1997). Web use in the classroom gives learners the opportunity to develop technology skills and experiences in contexts that are similar to those outside the classroom (Flannery, 1998). Creating a web page can also give students great satisfaction and help them develop advanced computer skills (Krajka, 2000). Although technology can enhance language skills in many other forms, teachers must have the skills and abilities necessary to use the tools properly for ESL instruction. If teachers are not prepared to use these tools, ESL students will not be able to benefit from all technology can offer.

Methodology

This qualitative study explored Puerto Rican language teachers' perceptions, experiences and attitudes towards their teacher education programs in the integration of learning technologies in their courses. The data emerged from a questionnaire, four focus groups, and nine in-depth interviews.

One focus group consisted of 7 student teachers before their field experience. The second focus group consisted of 12 education juniors and seniors, and the third focus group consisted of 9 students with less than two years in the teacher education program. The fourth focus group was held with 10 participants from the first two focus groups after they completed their student teaching experience. Individual interviews were conducted with 9 in-service language teachers, some of whom supervised student teachers. All interviews were tape-recorded and transcribed. The participants' confidentiality was protected by using pseudonyms. Emerging themes were sorted and coded using QSR NUD*IST to provide a framework for data analysis and subsequent

writing.

Participants

All of the participants were from the northwestern part of Puerto Rico. The 28 pre-service teachers ranged from sophomores in their teacher education program to some with teaching experience. Twenty-seven of them were in the Teaching English as a Second Language (TESOL) program and one was in the Spanish teaching program. They ranged in age from 20 to 52. The average age was 29 years old. Twenty participants were female (71%) and 8 (29%) were male.

The 9 in-service language teachers ranged from 1 to 27 years of teaching experience. The average teaching experience was 18 years. They ranged in age from 36 to 51. The average age was 44 years old. Eight participants were female (89%) and 1 (11%) male. Among the in-service teachers only one has never used computers. Fifty-four percent of the pre-service participants and 56% of the in-service participants have been using computers for less than five years. Of the pre-service participants, 28% and 22% of the in-service participants have been using computers for more than five years. Only 18% of the pre-service participants and 11% of the in-service teachers have been using computers more than ten years.

In other words, most of these language teachers have been using computers less than five years. Nevertheless, 39% of the pre-service and 56% of the in-service teachers are currently using computers every day and 54% of the pre-service teachers and 33% of the in-service teachers use it once or twice a week. The pre-service teachers (57%) and in-service teachers (77%) use it mostly at home. Only 11% of the in-service teachers use the computer at work.

Only 1% of the pre-service and 11% of the in-service teachers feel very prepared to use computers in teaching and 32% of the pre-service and 33% of the in-service teachers feel prepared. Although both groups are familiar with the same types of programs, only 36% of pre-service teachers and 78% of the in-service teachers feel prepared to integrate Microsoft PowerPoint in their courses. They mostly use Microsoft Word for word processing.

Findings

Through the focus groups, 28 pre-service teachers and 9 in-service participants shared their experiences with learning technologies. The following themes emerged:

a. Contents of courses
b. Modeling of technology use
c. Self acquisition of skills
d. Access and exposure

e. Practical integration

Contents of Courses

Pre-service Focus Groups

Many schools of education are currently requiring pre-service teachers to take computer courses. The pre-service teachers in this study were required to take an Introduction to Computers course and an Educational Technology course. However, they felt this was not sufficient to have a significant impact on their future teaching.

> Tina: *I'm going to graduate; this is my last semester and I've only had the required two computer classes. I was taking the course and I would talk to the professor and he tried to be helpful, but it was only an hour course, one hour.*

According to them, the course that was intended to teach the use of technology in education did not provide the hands-on experiences they expected.

> Jane: *Well, if it's called the Use of Technology, please let us use the technology in education.*

While some of these pre-service teachers were very disappointed with the technology courses, others felt they had benefited greatly from them.

> María: *I have a different opinion. In the Use of Technology the teacher did a good job. She taught us how to use Power Point when we gave a speech, how to use it with students. She taught Excel, WordPerfect and all those programs we learned a little of each, basically what we need to know when we are going to give a class. She also taught us how to do exams. I learned a lot; that's why I know how to use the computer now.*

In-service Interviews

Most of the in-service teachers had completed their teacher education programs over a decade ago. Although 67% of the participants had graduate degrees, 33% completed their programs over 16 years ago. One participant with no graduate degree completed her undergraduate teacher education program 26 years ago.

The participants who have completed their degrees in the last 5 years feel more comfortable with computers than those who did over 15 years ago. Nevertheless, they still did not feel prepared to integrate the emerging technologies into their language lessons. The veteran teachers felt they were at a disadvantage and they needed to catch up.

Peggy: *I feel I have to go out and get more knowledge.*

Melissa: *When I was an education student, computers weren't used like nowadays. Students today know more about computers than most of the teachers.*

Liz: *I have never used computers.*

One of the teachers was back in college taking courses needed for another certification.

Peggy: *In my BA in elementary education nor in my other courses for certification as an ESL teacher did I take any courses in technology. The things that I have learned I have learned in your course. These other courses just emphasized the traditional: pictures, index cards, flash cards, and journals.*

Another participant who has been teaching for only a year felt he had not been taught to use modern technologies.

Raul: *The technology class I took in education was all theoretical. Now I have no idea how to use many machines. I was never taught to use a projector in any of my presentations in the university.*

Most veteran teachers depend on in-service professional development to acquire the necessary skills for the effective integration of technology in language teaching. Understanding the urgency to prepare teachers in the learning technologies, Puerto Rico's Department of Education has increased teacher training.

Debbie: *The Department of Education is giving teachers the opportunity to prepare ourselves by offering workshops for us.*

Raúl: *They have already sent me on a number of workshops. They encourage extra education and provide as much help as possible.*

From August to December 2002, nine courses were offered. Most of them were on the use of Microsoft Office. A course on the integration of the Internet was scheduled in 2003. A description of these courses was posted on the Department's web page at http://eduportal.de.gobierno.pr.

Post Student Teaching Focus Group

After completing their student teaching, a group of 10 participants interviewed prior to their field experience were interviewed again. These participants felt they were not provided with sufficient practical experiences early enough in the program. When they faced the reality of being in front of an actual classroom, they realized they were not

prepared.

> Ana: *We needed more practice, more hands on technology courses.*
>
> Yoly: *We felt limited of the things we can do with technology when there is so much more.*
>
> Nina: *We are in the 21st century. Kids sometimes know more computers than the teachers.*

In general, these participants thought they did the best they could during their student teaching. However, they understood there were numerous things they could have done to enhance their students' language skills with technology if they would have had the knowledge.

While most in-service teachers believed the Department of Education is trying to prepare them in the use of the emerging technologies, others thought that a lot still needs to be done. Compared to the teachers in the United States, they felt Puerto Rico's teachers are behind. They are not well prepared to integrate technology into the language courses they currently teach or will be teaching. They stated the courses they have taken expecting the use of technology were mostly based on theory and not on hands on activities. The few who did get the exposure and had the practical experiences felt very fortunate.

Modeling of Technology Use

Pre-service Focus Groups

The pre-service teachers believed faculty must integrate technology into their courses and model its use in the classroom. They felt faculty did not use technology in their classes because they were more comfortable with the traditional approaches and it was considered more work. They wanted their professors to at least bring their laptops into the classroom and provide examples of using computers in instruction.

> Tina: *I think these professors should bring their computers once in a while and show us how to do something.*

These prospective teachers were expecting a technology-enriched environment in which their teachers modeled the integration of technology through their own teaching. Although they recognized a few of their college professors were using technology to a certain degree, they felt it should be modeled throughout the teacher education program.

Based on the experiences they shared, technology was just a concept mentioned in many of their college courses, but its use and benefits modeled only by a few of their

teachers. They have not been able to link theory to practice being modeled by college faculty. The participants emphasized that for prospective teachers to integrate technology into their teaching their teachers must provide examples of teaching and learning enhanced with technology.

In-service Interviews

Most of the in-service teachers admitted they were not modeling the use of modern technologies in the classroom to pre-service teachers because they lacked the skills. They felt more comfortable using the television, cassette players, and VCRs than using computers and multimedia technologies.

> Melissa: *Most of us are ill-prepared for the task at hand.*
>
> Peggy: *Not enough knowledge of the new technology for what is ahead of us.*

Only three of the in-service teachers interviewed felt they had the necessary skills to model the effective use of modern technology. However, they did not always have the technology to develop technology-enhanced lessons. One of them had a Masters degree in Educational Technology, but believed the lack of support from administrators affected the actual use of technology in the classroom. She was willing and able to integrate more technology into her classes and model its use to prospective teachers, but had not been able to.

> Amanda: *They are reluctant to try new things that deviate from the traditional classroom environment.*

Although the majority of the teachers received laptop computers, most did not use them for teaching. Once again teachers confirmed they felt more comfortable using the traditional technologies they have had more practice with than those they lack training for.

Post Student Teaching Focus Group

The student teachers interviewed were placed with cooperating teachers with different levels of technology proficiency. Some were exposed to technology in teaching while others were not. Those who had the opportunity of working with technology proficient in-service teachers enjoyed a lot more their student teaching experience.

> Yoly: *I had a good experience because my cooperating teacher was great. She was very dynamic. She used computers, TV, VCR, books, everything.*
>
> Abigail: *You were lucky. I was using dittos.*

All of them were expecting to learn more hands on technology use during their field experiences. However, the technology used by their cooperating teachers was very limited. They mostly used the TV and VCR. Only one of the student teachers was exposed to the use of a computer in the classroom for multimedia presentations and language development. They agreed that if in-service teachers modeled the use of the modern technologies they would feel better prepared to use these themselves. For prospective teachers to understand how modern technologies can become effective teaching tools, they must see other teachers using the emerging technologies in their own teaching and serving as models of good teaching.

Self-Acquisition of Technology Skills

Pre-service Focus Groups

Most of the prospective teachers have learned to use technology by asking others and trying things out on their own and not through formal instruction. They insisted the courses they had taken did not prepare them to utilize technologies effectively.

> Al: *I guess I learned on my own, working by myself. I have the basic skills. I guess computer courses should include how to make web pages, attachments, copy and paste. I learned all that on my own: how to get this picture in this program, how to open this program and minimize it.*
>
> Cynthia: *I don't know about you guys, but I'm learning by doing observations in schools and talking to other classmates and trying to figure it out.*

Although most of them have learned to use technology for academic work and personal use, they have yet a lot to learn about technology in language teaching. They believe their courses provided them with some basic technology knowledge, but offered limited hands on opportunities.

> Susan: *They should just give us a chance to use it, to apply it.*

Since knowledge and competency does not readily translate into effective integration of technology in the classroom, prospective teachers have to determine ways to apply these. Saturating them with information is not sufficient.

> Cynthia: *It's not that they don't teach us, but talking to us and making us write hundreds of words on a piece of paper is not helping us. We need some hands on. I went to a school that uses a satellite to teach a class. I was like how do you turn the TV on? I couldn't figure it out.*

According to these prospective teachers, they were rarely engaged in activities that would prepare them to integrate technology into authentic learning experiences.

In-service Interviews

The in-service teachers worked in different schools throughout the same school district. While some were being prepared to use technology, others thought the training provided through professional development workshops was not addressing their needs. They believed the Department of Education is not preparing them to teach in the Information Age. The training provided does not help them in developing the professional knowledge base and skills necessary to utilize learning technologies to enhance teaching and learning in their classrooms. Therefore, they have found other ways of developing these skills.

> Dolly: *I have taken continuing education classes in computers. I also learned how to use Word and Power Point when I worked in the School to Work Program in the University of Puerto Rico.*

In Puerto Rico, the schools are divided in regions. Each region provides professional development opportunities to their teachers. However, when a region does not have the personnel trained to provide training, these teachers are affected negatively. Some teachers feel they are completely on their own. Several of the teachers have had no training at all.

> Peggy: *I have done everything on my own. No training. We don't have a regional supervisor.*

A few of the teachers had attended similar technology workshops, but their experiences varied. Although some had developed basic computer skills, they were not trained in integrating the skills acquired into their own teaching. They agreed that learning about technology does not prepare them to use it in the classroom.

Post Student Teaching Focus Group

Most student teachers felt they had to figure things out on their own during their field experiences. Those that had the opportunity of using some type of technology in their classrooms thought it was worth the extra effort. They were constantly searching for ways of presenting their lesson that would get their students interested. They believed technology was a motivating teaching tool. However, they had to teach themselves before they actually used them.

> Valerie: *It was time consuming, and sometimes stressful, but it was also rewarding.*

> Jenny: *Every time students see something new they are more interested. We have to come up with different techniques, methods to keep them motivated and interested in the class, so whatever is new in education, we*

should use everything. Let's get away from the routine of teachers talking and passing papers.

The student teachers felt that since they had not developed the technology skills during their teacher preparation program and did not always receive the necessary support from their cooperating teachers they needed to rely on one another.

> Abigail: *Sometimes we felt lost. I would ask others. They expected for us to know it.*

All participants agreed that ongoing professional development is necessary to keep up to date with the integration of the emerging technologies in language teaching. A richer, technology-based curriculum would prepare them to use technology and avoid the sense of confusion experienced when trying to figure things out on their own. Moreover, they wanted more support and guidance from college faculty, cooperating teachers and administrators.

Access and Exposure

Pre-service Focus Group

Although 57% of the participants have access to computers at home, many of these education students depend on the computers at the university for their academic work and for developing computer skills. However, these are not always available when they need them which results in additional time and frustration especially for students who budget their time very closely.

> Al: *I think the computer is like a world library. It does not take the place of the teacher, but it helps them greatly and it makes things easier. You can find things faster and easier in the Internet. At first to use the university computers there was a sign that said the computers were for research and not for chatting. Now when you are going to use the computer, people are chatting, playing games or printing pictures. People who actually want to use the computer have to sit there and wait a whole hour.*

The participants shared their experiences with courses in which the use of technology was required and how they benefited from this experience. Journaling online is one of many choices for integrating technology into a course, but the ramifications of learning and practicing that one regular assignment were impressive. These pre-service teachers were required to submit online journals in their composition courses.

> Carla: *Well, I learned how to get in the Internet with 2311 when I had to do my first journal. That's how I learned.*

> Jane: *For the journals, I knew how to send e-mails. I learned how to send*

an attachment when you showed me, I said: Wow, that's all I have to do, and I've taken like three computer courses.

Wendy: *I think the important thing is that you require us to use it every week. You know that it's practice. If we don't have the practice, we don't get to use it, we don't know what to do because I myself learned it from your class when you forced us to send those journals every week and we practiced on the computer.*

Although only a few of their courses integrated the Internet, those that did were described as innovative, creative and contemporary. The pre-service teachers believed Internet use should be part of all college courses. They felt they should be exposed to the Internet as an instructional tool so they can use it in their own teaching. The more they are required to use the Internet the more familiar they become with the options that are available to them through this amazing tool.

Ralph: *Using the Internet is creative. Like in my methods class we had to do a project with Internet. We had to find different teaching methods and strategies and use them in the classroom.*

These prospective teachers believe web-enhanced courses should be part of their teacher education program. They were also interested in learning how to design online courses.

Jonathan: *Professor, they should teach us through the Web and how to make classes through the Web.*

Sam: *Two years ago, I didn't know how to even work with a computer, how to turn it on. Now I have one in my house. I practice. I know how to make Web Quests. I took three classes on the web. It was great.*

The participants agreed that teacher education programs have not kept up to pace with the rapid changes in technology. Schools of education that prepare language teachers should teach them to use multimedia computer applications and Web tools that support language learning.

In-Service Interviews

Although the interest for the integration of technology in teaching is evident, all of the participants interviewed mentioned the lack of access to technology as one of the reasons for the under use of technology in the language classroom.

Peggy: *There is nothing for us to use. For example, if there is a TV set we have to go on a waiting list; maybe I can get my TV if I ask for it today, in a month.*

These teachers expressed their frustration with not having the technology they want to use in their courses. Some have made personal sacrifices to acquire equipment and materials. Most spent of their own money. They just could not wait indefinitely for the school to provide them with the technology.

> Peggy: *What I did with my students was asked Sensormatic for a small donation and I bought my own TV. I took my DVD, my personal one; I have it in my classroom. My overhead projector I had to buy it. I bought it because I can't wait for other people. I need it.*

Most teachers were given laptop computers two years ago, but report they were not trained to use them. Moreover, they were not provided with adequate professional development on the integration of learning technologies in language teaching.

> Milly: *They just gave us the computer. We had to sign for the license. If we retire, we have to return it and we cannot program the computer with other software. If we do, we have to hand in the licenses to the Department.*

Although thousands of computers were distributed among public school teachers, not all teachers received them. Non-permanent teachers and those with administrative positions did not qualify. They have to wait until one becomes available.

> Raúl: *I don't have access to a laptop because I'm not a permanent employee. I'm just getting my foot on the ground. I can't really use any real technology. I would have to ask for permission in advance, so it could take awhile. There are obstacles there.*

> Liz: *I have never used computers. I didn't get a laptop because I was the Spanish supervisor and I didn't qualify.*

Post Student Teaching Focus Group

After their student teaching experience, the pre-service teachers expressed the same concerns the in-service teachers had. They felt the lack of access to materials and technology in the schools limited their integration of learning technologies into their courses. These student teachers were placed in different schools throughout the district. One of the schools had no classroom technology, computer labs, or Internet. Some had computer labs, but no Internet access. Only one of the schools had some classroom technology. Therefore, some of their experiences with technology were closely related to their assigned schools.

Most of these participants were not able to integrate computers or other technologies into their language classrooms as they desired. The few computers available in the schools were either not working or not used for educational purposes. For Puerto Rico, where only 21% of households have computers, schools should be able to provide their

students with enriching computer educational experiences. However, according to these student teachers, that was not the case.

> Nina: *We had computers at the school but they were just for the kids to play in. They weren't supposed to do anything else there. The computers were only working for like two months.*

> Betty: *There are three computers and none of them work. Three computers in the whole school in the library and they don't work.*

Only two of the participants felt they had reasonable access to technology and were able to get hands on experience with using technology to teach language.

> Yoly: *I had all the materials. We had computers, TV, VCR, books, everything.*

> Iris: *We had a computer in the classroom, but no Internet access yet.*

These two student teachers considered themselves lucky because they were placed in a new school with a lot more technology than the other student teachers. Although they only had one computer and a TV/VCR set, they felt very fortunate. In addition, their school had language computer labs available to students. According to the other participants, this is the only school in the region that has the equipment and infrastructure to support the emerging learning technologies.

> Alice: *But that is one of the few schools in PR that is technologically prepared.*

Practical Integration

Pre-service Focus Groups

The prospective teachers interviewed were aware of the advantages of using technology for language teaching. They considered technology a valuable tool for language development. Cassettes, videos, and televisions have been used for years to teach language. However, they felt their teacher education courses have not prepared them to use modern technologies. They believe their courses should emphasize the use of technologies to enhance language skills.

> Mary: *I believe one can integrate technology in teaching language. For example, students can find pen-pals from other countries and e-mail each other. That way they can share and exchange culture and language. However, the courses I have taken have not taught us to integrate this type of technology in the language classroom.*

Sam: *Nowadays students are characterized by reacting faster to visual stimulation. We need to motivate them and make them fall in love with learning a language by using technology.*

According to these instructors, English and technology go hand in hand. In fact, they believe English can facilitate the use of technology and technology can enhance language skills. Students can practice their communications skills and learn how to use a variety of programs that can help them academically.

Chris: *Most programs and software are in English. It is essential to reinforce the English skills for students to understand and use technology. On the other hand, they can practice English when they are using one of those programs.*

The participants also emphasized how technology encourages and facilitates self-instruction. Many computerized language programs provide individualized instruction and immediate feedback. If these are used effectively, they can enhance students' language skills.

Mary: *Sometimes teachers because of lack of time cannot provide the individual attention certain students require. However, there are programs that can give them individual feedback. For example, there is a phonetic program that pronounces the different phonemes and corrects pronunciation. This is a great form of technology, and it can be used for other language skills efficiently.*

In-service Interviews

The in-service participants also agreed on the benefits of technology in language learning and teaching. They believe the integration of multimedia and a variety of learning technologies in language classes augment all language skills.

Amanda: *Technology supports the use of English courses. The use of Computer Assisted Instruction that combines visual, audio, and multimedia helps deliver lessons students can relate to.*

One participant taught English in a special bilingual school. This was one of the few public bilingual schools in Puerto Rico. Since it was a special program the Secretary of Education had introduced, it had technology none of the other public schools did. The school was recently closed under the new administration.

Elsie: *I taught my 10th grade students to use the Internet for searches and e-mailing. I also taught them to use Word and Power Point to create presentations and portfolios and to use the multimedia program English Discoveries to improve their language skills.*

Although they understand the benefits of learning technologies in language development, they realize these are not always being used as instructional tools.

> Amanda: *We are years behind in relation to technology integration in language teaching.*

> Raúl: *The kids love using the computers when the computer teacher has them. What I don't see are the language teachers taking the kids out of the classroom to the computer room at least once or twice a week, so they can use it for language development.*

They also mentioned the need to help students develop reading skills. According to these experienced language teachers, students do not like to read, but technology can motivate them to do so.

> Peggy: *Students hate reading, so let's use different strategies. We have to try to make them love English. After I have tried out the new things, their grades are improving, attendance has been great.*

> Raul: *We have very few readers. They have no idea on how to approach literature. They are not readers, and they are definitely not writers. We are producing oral speakers. In this culture they don't have them read. If they are in the Internet, we should have them read.*

The only school equipped with a language computer lab offered a technology based elective conversational English class. With the use of computers and other modern technologies, students practice their communication skills.

> Dolly: *If students want, they can take an elective conversational English class in the lab.*

The lab is equipped with computers and the English Discoveries program. This language learning series offers listening, speaking, reading, writing, vocabulary and grammar building activities. The multimedia software includes animation, high-resolution graphics, video, voice recording, and exercises in entertaining formats.

The other teachers had no access to programs such as English Discoveries in their schools. Many confronted problems when trying to use the computer as a learning tool and felt frustrated. Therefore, they limit the use of technology to and don't maximize the possibilities technology provides to language skills development.

> Peggy: *With the computer teacher I take my students three times a month to the computer room. There are only 11 computers. They have to take turns. My classes are 45 students per group, so imagine. Sometimes I send 22 and they share the seats. There are only 11 computers for the whole*

school, over a thousand students. Last time I had to take my printer. There was no ink for the printer. It is hard. The technician emphasizes the skill that I'm giving in the classroom. When I give them homework, they go to the Internet with the help of my teacher aide and the technician. Basically that is what they do there.

As one of the participants summarized:

> Amanda: *Lack of equipment, maintenance and the lack of education programs geared toward specific skills along with resistance to trying new things that deviates from traditional classroom environments hinder the use of LT in the classrooms.*

On the other hand, others expressed their desire to continue learning. They realized new technologies keep emerging and they have to evolve as well. According to some of the veteran teachers, life-long learning should be every teacher's philosophy.

> Peggy: *We need to keep on studying. I have learned and improved during this semester integrating the Internet in my English class.*

Post Student Teaching Focus Group

Based on the pre-service participants' field experiences, the technologies available and mostly used during their student teaching were TV/VCRs and projectors. They showed movies and had students react. Students enjoyed these classroom activities and teachers considered them effective language development techniques.

> Alice: *I used a TV and VCR for literature classes. I will show them the movie and they will compare and contrast the movie and what they read.*

The overhead projector-a 70 year old technology, the TV- a 50 year old technology and the VCR- a 25 year old technology was what some of them had available. A few did not even have a TV and VCR available and only one of these teachers was able to integrate the computer to develop language skills during her student teaching. She was very satisfied with that experience and its outcomes.

> María: *I was able to use a computer. We have a computer room. I had a phonics class and they were having problems with the long /i/ and short /I/ sounds. I was able to use the computer to teach that with a phonics game and the students had a great time while they learned.*

Most of their experiences with the use of technology during their student teaching were not so positive or educational. Based on their anecdotes, they witnessed the misconceptions of administrators on the use of technology in education. In the few schools computers were available they were not used for academic purposes but as a

means of entertainment.

> Nina: *They had a computer class every Monday for half an hour. They had no grades for that because it was just to play games on the computer. We asked for educational programs, but they said just have them play games and watch TV.*

Although they all expressed deep satisfaction with what they accomplished during their field experiences despite their limitations, many of them wanted more opportunities to use technology.

> Yoly: *I have always wanted to give a class with Power Point to see how they react to it and have the little pictures and everything. We had a computer, but we didn't have the projector for the computer.*

According to these participants, schools are really not up-to-date on learning technologies and its use in language teaching and learning. Generation Y students are surrounded by technological devices and electronic games. They are also interested in learning with nontraditional instructional tools. Integrating technology into the language classroom makes learning enjoyable. E-mailing, chatting, electronic portfolios, Web Quests, are just some of the strategies that help students improve their language skills while they are interacting and using technology.

> Alice: *We have to remember that the students that we are dealing with today are not the same as before. Before students were more dedicated to their studies. Now they are hooked on technology: Nintendo, computers, Game Boy, X Box. We should use things like that to keep them interested.*

Discussion

Although this study was conducted among language teachers in western Puerto Rico, it confirms the problem encountered by many teachers nationwide. The preparation of pre-service teachers and the continuing education of in-service teachers are a challenge to higher education institutions and school administrators everywhere. Teacher education programs are currently being held accountable for new teachers' lack of skills and exposure to learning technologies for instructional purposes.

According to the CEO Forum on Education and Technology (2000), less than half of the nation's teacher preparation programs require students to design and deliver instruction with technology and even fewer require it in student teaching. In this study pre-service teachers were not required to use technology in their teacher education courses nor in their student teaching. Moreover, according to the National Educational Technology Standards (2003), none of Puerto Rico's 31 colleges of education have adopted these standards.

With the increasing of technology standards for teachers in the United States (NETS, 2003), it is essential for Puerto Rico's pre-service teachers to use more technologies throughout their teacher preparation programs. However, as this study suggests, pre-service teachers are not developing the necessary skills to incorporate technology into their classroom instruction.

New teachers must be ready to step into the status quo as well as to advance the profession by infusing technology into their teaching (Pope & Golub, 2000). Jacobsen, Clifford, and Friesen (2002) believe one of the problems with current professional development in learning technologies is that the visions for the use of technology for teaching and learning are often created by instructional technology specialists who are not educators. According to the participants in this study, some of their computer courses were too technical, and did not provide sufficient hands on activities.

Unlike many of the states, Puerto Rico's teachers are not required to pursue a graduate degree to attain tenure. According to Puerto Rico's State Report card (Villamil-Silvey, 2002), currently 92% of Puerto Rico teachers are tenured and only 15% have a Masters degree. Therefore, undergraduate education programs need to equip teachers with the skills they must use during their teaching career. Since technology is constantly evolving and new ones emerging, ongoing professional development for teachers is crucial.

Recommendations for Improvements in the Field

Based on the findings, the following recommendations are made to Puerto Rico's Colleges and Department of Education: (a) integrate technology across the curriculum, (b) emphasize technology use in language teaching (c) invest in technology resources, (d) strive to meet the National Educational Technology Standards, (e) provide suitable technology models for teaching and learning, and (g) build learning communities among pre-service, in-service teachers, teacher educators and administrators.

Integrate Technology across the Curriculum

For pre-service teachers to develop the technology skills required and feel comfortable using the emerging technologies, teacher preparation programs must integrate technology across their pre-service curriculum. If new teachers are expected to enter the classroom ready to teach with technology, they must be prepared to do so throughout their teacher preparation program. Computer classes that teach only the use of programs are not enough to prepare future students to use technology for instruction. Education courses need to include teaching the use of technology in the content areas. Research shows the need to do much more than teach technology skills (McKenzie, 2001).

Mary: *Maybe we need a course that teaches how to integrate computers*

and other technologies, especially in the subject the future teacher will be teaching, you can learn the different programs that one can use to teach that subject when you begin teaching.

Other participants thought many theoretical courses could be substituted by courses that will prepare them better in integrating technology into the subject they will be teaching, the use of computer programs, the Internet and web tools. Pre-service students thought that teacher education programs must also provide students with distance learning experiences. To appreciate the opportunities online instruction provides, they must go through the experience themselves as learners. This exposure to a variety of technology-driven learning opportunities will provide the hands on experiences they are seeking.

Jonathan: *All education students should be required to take an online class. That will help them go through the experience first hand and understand its advantages and disadvantages.*

Teachers want hands-on activities such as: constructing online texts and multimedia documents, incorporating commercial software into the curriculum, using a listserv, emailing journals, working on electronic portfolios; downloading and storing materials from the Web, using digital images and presentation software; chatting; and delivering lessons with a variety of modern technologies. When these activities and projects are incorporated across the pre-service teacher's curriculum, they will be prepared to use them when they are teaching.

Sam: *I think that adding credits is not the best way of solving this problem. I believe it is integrating technology in the classroom. Students that are obviously learning to teach language will learn to teach as they were taught. Technology should be integrated in the classes we are taking.*

Emphasize Technology Use in Language Teaching

Puerto Rico's language curriculum is at a critical stage. In recent test scores on standardized exams, all grades scored below a 50% on student achievement in English and only in third grade was the achievement in Spanish over 62% (Ghigliotty, 2002). Puerto Rico's constant debate over English instruction and bilingual education has affected the focus of the language curriculum and consequently, student performance.

Teachers interviewed believe that all schools should have language computer labs with multimedia technology and every language classroom should have computers available for daily classroom language instruction.

Peggy: *We should have at least five computers per classroom.*

Through technology students can be exposed to a variety of experiences that develop language skills. It is imperative for students in Puerto Rico to improve their language skills and be exposed to the modern technologies many have limited access to. Technologies that facilitate language learning and address students' individual needs must be part of Puerto Rico's curriculum.

Puerto Rico's colleges of education need to prepare prospective language educators so they may feel comfortable with using a variety of modern technologies. Technology must become an integral part of every program responsible for preparing teachers. The success of technologies used in language studies depends on how they are integrated into the curriculum. Classes should infuse technology in a way that it supports content pedagogy and prepares teachers with the technical and pedagogical skills needed in a learner-centered classroom.

> Iris: *A couple of weeks ago I went to a TESOL convention and the technology workshop they gave us was excellent. A class like that using the Internet to find materials and things like that would be good. I was so happy. We looked like little kids looking through the different websites. It is great. That is what we need as teachers. They even gave us a lesson plan on how to teach this.*

Invest in Technology

Participants supported the thought behind a slogan placed on the wall of one of their classrooms that says: " English and Technology: The Key to a Brighter Future." In today's world, technology and English should be considered necessities, no amenities. With a 50% student dropout rate (Mulero, 2002), and a 13% unemployment rate (U.S. Department of Labor, 2003), Puerto Rico cannot afford to ignore the fact that our society needs the language and technology skills required to become more competitive worldwide. Puerto Rico's economic growth depends greatly on their investment in education. Investing in technology to improve the language program is a must so future leaders can have the skills this digitized world needs.

While the participants repeatedly expressed they had to make personal sacrifices to obtain the materials they needed, Department of Education officials are being accused for misusing federal and state funds. Some have even been convicted for such acts (Varela, 2003). Government cutbacks in personnel and other resources have always affected the language classroom (Barbosa, 2002). It is time for Puerto Rico's government to evaluate their priorities.

On many occasions, money assigned for educational technology has been spent unwisely. In 2000, Puerto Rico's Secretary of Education admitted that laptop computers were distributed to teachers without providing teacher training (Ruaño, 2000). Technology without well-trained teachers on how to use it in the classroom is worthless.

Moreover, although 180 million dollars had been spent on Internet E-rate connection, by January 2001 none of Puerto Rico's public schools had access to the Internet. Out of the 1,500 public schools only 450 were connected by 2002, only 30% (Mulero, 2002) compared to 99% in the United States mainland. According to Martinez (2002), to close the digital divide, education and technology/infrastructure problems need to be addressed first. Since incorporating more technology, requires additional investment; many programs are held back.

Meet the National Educational Technology Standards

Colleges of education design their curriculum based on what Puerto Rico's Department of Education requires for their teachers to be certified. Standards for teacher preparation programs to be accredited are also developed by Puerto Rico's Higher Education Council. Puerto Rico's teacher education programs should be restructured to meet the National Educational Technology Standards (NETS). These standards can help teacher preparation programs create a set of benchmarks in planning their teacher education curriculum. The Profiles suggested by the NETS correspond to four phases in the preparation of a teacher: general preparation, professional preparation, student teaching and first year teaching (http://cnets.iste.org).

According to NETS reports, although Puerto Rico has 31 teacher preparation programs throughout the Island, none of these have even referenced NETS. If Puerto Rico's teacher education programs would raise the technology standards of prospective teachers, these teachers would go into classrooms better prepared and become advocates for access to technology in those schools where there is so much need.

The NETS model for pre-service teachers exposes future teachers to the emerging technologies throughout their curriculum. Pre-service teachers must encounter the effective infusion of technology in their own learning and student teaching to be able to bring the skills and experiences that are needed to transform today's classroom (Jacobsen, Clifford & Friesen, 2002).

Provide Suitable Models

By using technology in their own teaching, teacher educators and language faculty can provide education students examples of effective technology integration. As the participants mentioned, some of the skills and strategies they had learned for technology integration in the language classroom, they learned in classes where technology was a requirement.

> Wendy: I think the important thing is that you require us to use it every week. You know that it's practice.
>
> If we don't have the practice, we don't get to use it, we don't know what to

do. I learned it from your class when you forced us to send those journals every week and we practiced on the computer.

Studies show that successful development of new teachers depends heavily on their student teaching experience (ISTE, 2001). Pre-service teachers should be required to use technology in their field experiences. In this study, student teachers expressed the desire to apply new technologies in classroom settings. Therefore, they need to be placed under the supervision of cooperating teachers who can advise them and model the use of technology in education. They must understand the value of the emerging technologies and work together to prepare effective lessons (McKenzie, 2001).

Build Learning Communities

Puerto Rico's schools and colleges of education need to work together to provide opportunities for teachers to use technology to enrich the language curriculum. Teacher educators, pre-service and in-service teachers should share strategies, methods, and techniques of best practices. According to the participants, teachers usually work in isolation.

> Raul: *In the year I have worked in the public system I have benefited from the valuable experience of the veteran teachers. Some are forthcoming and help you out. The only thing I understand they have to work on is the comradeship. Teachers are too individualistic. They have to work better together. They are not interacting.*

Colleges of education and Puerto Rico's Department of Education need to develop jointly teacher training programs and workshops for language educators that do not just speak about technology but use technology continuously. These programs should encourage pre-service, in-service, language faculty and teacher educators' participation. The use of modern technologies to teach language should be part of every school and college's agenda.

Teacher educators, cooperating teachers and student teachers need to make the student teaching experience an enriching one. They must engage in real collaboration to integrate technology in the language classrooms and create curricula that utilize technology to develop language skills, provide individualized and interactive student centered activities and continuous feedback.

For the successful integration of these learning technologies into teacher education programs and to meet our schools and students need, we must all join forces. What is needed is a systemic effort that requires collaboration by all parties: administrators, faculty, supervising teachers and students. We must all face the challenge together on behalf of this generation and the generations to come.

Limitations of the Study

This study was conducted with participants from the western part of Puerto Rico. Therefore, the findings may not be representative of teachers in other parts of the Island. Due to the limited technology available in the schools observed, successful integration of technology use in language teaching was not a major contribution to the study. Political factors also hinder the opportunity to gather information from other school districts and school administrators. Information requested from school districts and Puerto Rico's Department of Education on the current schools with Internet access throughout the Island was not released due to pending legal issues.

Recommendations for Further Research

The purpose of this qualitative study was to document and interpret the experiences and attitudes of teachers toward their preparation in the use of learning technologies in Puerto Rico. Schools nationwide are in urgent need of teachers who are capable and comfortable with applying a broad spectrum of advanced technologies to meet the learning needs of their students. Further research is needed to investigate various approaches that will help prepare this new generation of teachers.

Additionally, a study should also be undertaken to determine how teachers were prepared in technology integration in the four universities in Puerto Rico that have received PT3 grants. After identifying schools in the Island that have integrated technology in their language curricula, an experimental research in those classrooms should also be conducted.

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About the Author

Nancy Velazquez-Torres has extensive experience in teaching and working with diverse student populations in New York and Puerto Rico. She has occupied faculty and administrative positions at the elementary, secondary and college levels. Her educational background is in ESL/TESOL, multicultural education, bilingualism, and distance learning. Dr. Velazquez-Torres has also developed and worked in adult education programs and has been actively involved in providing community services to Hispanics and other under-served groups. Her academic and research interests are in the use of the emerging technologies to enhance language learning. She is currently the Title V Learning Enhancement Center at Metropolitan College of New York. Nancy Velazquez-Torres has received numerous awards and recognition for her commitment to innovative teaching and serving.

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