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**Teachers Sharing New Digital Technology: Practices from the Field**

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## Introduction

The rise of digital technology use and application in society, such as computers, laptops, smart phones, tablets, and software programs (Oppenheim, 2010) has prompted U.S. schools to attempt to keep up with this rapid advancement. Internet access in schools increased dramatically from the mid-1990s to mid-2000s with 100% of U.S. schools and 90% of classrooms having connectivity (Parsad & Jones, 2005; Wells & Lewis, 2006). In addition, the ratio of students to Internet-connected computers improved from around 12 students to one computer in 1998 to 3.8 students per computer in 2005 (Wells & Lewis, 2006). Besides computers and Internet connections, teachers and students had access to hand-held devices such as tablets in 19% of schools in 2005, with more schools providing devices to teachers than students (Wells & Lewis, 2006). Amid this context of high technology availability, it is of interest to identify how technology is used in the classroom specifically with English Language Learners (ELLs). ELLs in U.S. schools are students whose first language is not English and they are in the process of learning English. While in school, ELLs need to learn both the English language and academic content (Short & Fitzsimmons, 2007) and technology use can increase participation, engagement, and collaboration (Huang & Lin, 2011), and improve ELLs' learning (Felix, 2005; Wang & Vásquez, 2012; Zhao, 2003).

Affordances and uses of new technology in the language learning classroom are varied. A review of the research on the use of technology in the language learning classroom, specifically Web 2.0 tools (such as blogs, wikis, podcasts, social networking applications and Google Docs) suggests that integration of technology benefits students' language learning (Wang & Vásquez, 2012). Technology and technology applications can support the language learning process in various ways. For example, wikis and blogs could be used to teach and improve writing; and Web 2.0 technologies have the potential to increase opportunities for student collaboration and communication (Wang & Vásquez, 2012). iPods could be used to access audio and video recordings; dictionaries and translation apps; apps and games to help with language and content learning (Liu et al., 2014). Podcasts could be used to model fluent reading for ELLs; to collect samples of student language for assessment purposes; to expose students to content knowledge; or to communicate with families (Acosta & Garza, 2011). iPads allow ELLs to access apps to create multimedia books or presentations, flashcards, movies or plays; to collaborate with peers on projects; or to practice the language (Ahmed & Nasser, 2015). Vocabulary is an important component of ELLs' academic learning and technologies can help ELLs develop and learn new words (Dalton & Grisham, 2011). For example, online dictionaries and translators; online word games, texts and WebQuests; online read aloud applications and student created PowerPoints or digital stories provide opportunities for vocabulary learning (Dalton & Grisham, 2011).

## Purpose

The purpose of this study, which was part of a larger study, focused on technology in three English as a Second Language (ESL) middle school Language Arts classrooms, was to identify practices of new technology (e.g., computers, iPods, and digital boards) sharing by a team of three middle school ESL teachers in their ESL Language Arts classrooms. The term ESL refers to (a) classes in which ELLs receive support for their language learning from teachers who are trained to teach students whose first language is not English; and (b) the teachers who have the training to teach ELLs. The research question of this study was:

How do three ESL teachers in a U.S. middle school share the technology they have available for their ESL Language Arts classrooms?

In this study, I used the term *new (digital) technology* as described by Cuban (2001) in reference to computers; the Internet, websites; tablets, iPods, smart phones, and smart phones applications.

## **Context and Participants**

### **West Middle School**

The research site for the current study was West Middle School (all names in this report are pseudonyms), located in a mid-sized town in a Southern state. Based on publicly available data on the school's website, West Middle School had a student population of around 600 students in grades six through eight in the 2012-2013 academic year when the study took place. More than half of the students in the school were identified as Caucasian; the rest were African-American (over 20%) and Hispanic (around 10%). The ELL population was almost 15%<sup>[1]</sup> of the school population, and the percentage of students receiving free or reduced lunch data was approximately 40%.

### **Participants**

Participants in this study were the only three ESL teachers at West Middle School, Ms. Jones, Ms. Wong, and Ms. Miles. Ms. Jones was a 27-year-old Caucasian teacher who had taught for five years. Before coming to West Middle School, she taught mainstream elementary school in another state and she had ESL certification. Ms. Wong was a 27-year-old Caucasian teacher. She had taught for four years and she had multiple certifications: ESL, English, and History and she spoke Spanish at an intermediate level. Ms. Wong had taught at West Middle School for all four years of her teaching career. Ms. Miles was a 32-year-old Caucasian teacher. She had taught ESL for five years and she had ESL and Spanish certification. Before coming to West Middle School, Ms. Miles taught in another middle school in the same state. At the time of the study, the three teachers were either in the process or had obtained National Board Certification: Ms. Miles had her National Board Certification and Ms. Jones and Ms. Wong were working towards obtaining it.

All the three teachers taught one ESL Language Arts block per day to a group of ELLs and these were the classes observed for this study. There were other content classes the three teachers offered to ELLs at West Middle School such as Sheltered Civics or Sheltered Science and those classes, depending on the year or the number of ELLs, could be co-taught with a mainstream content area teacher. It was only in the ESL Language Arts class that teachers did not collaborate with another mainstream teacher.

### **Technology Available**

Since the focus of this study was sharing of technology, this section will talk about the available new technology for the three ESL teachers at West Middle School. The available technology consisted of:

1. Technology available to any teacher in the school: two desktop computer labs, an iPad cart, eight laptop carts, four desktop computers in the library, photo and video cameras, and iPods (nano and touches);
2. Technology available only to the ESL Department at West Middle School: four laptops and 15 iPod touches with headphones;
3. Technology readily available in each classroom: digital board, overhead projector for the digital board, teacher PC laptop, document camera (for only two of the teachers), PC desktop, iPad (for only one teacher), and Internet connections for all devices (cable Internet and wireless).

In comparison to national data, the three ESL teachers seem to have similar access to computers and the internet. Most US teachers have one or more computers in their classroom with internet access available most times, and more access to digital boards and projectors; less than half of US teachers have access to such devices (Gray, Thomas, & Lewis, 2010). Despite the increased availability of technology in the three ESL classrooms, the teachers shared the available technology on a regular basis so they had a device for each of their students for part of their classes.

## Methods

I observed each of the three ESL Language Arts classes once weekly for 10 weeks in the fall of 2012. Each class period was about 90 minutes and all three classes were small, with five to ten students in each class, and teachers and students had equal access to the technology mentioned above. I interviewed each of the three teachers twice during the data collection for about half an hour each session and had an additional 15-20 minute follow up interview with each of them.

The study employed qualitative-interpretive design and methods. My choice of the qualitative-interpretive research approach allowed me to understand the phenomenon of technology sharing in the context of the three ESL Language Arts classrooms (Schwartz-Shea & Yanow, 2012). The collected data consisted of classroom observation notes and teacher interviews, which allowed for triangulation of the data (Rossman & Rallis, 2012). Following Erickson's analytic induction (Erickson, 1986), I generated possible assertions from all the collected data (write ups of classroom observations and interview transcripts) using memos and themes I identified. The data corpus was read and re-read as a whole several times to identify possible assertions as well as confirming and disconfirming evidence (Erickson, 1986). In the next section I will share the findings and representative quotes and examples from the data to illustrate them.

## Findings

### Reasons to Share Technology

**Limited availability.** The findings suggest there was limited availability of technology. Even if the available technology for the three ESL teachers was above the national reported data (Gray et al., 2010), they were not yet at a level of having one digital device available for each student, and thus the need to share what was available. More recently, districts have had initiatives to provide each student with a digital device (Grenslitt, 2015), but at the time of the study West Middle School and the district had no such initiative. The three teachers shared the technology assigned to the ESL Department, specifically the laptops and the iPods, during the ESL Language Arts class. As noted before, there were four available laptops and 15 iPods to a total of 23 ELLs and the school had two PC labs, several laptop and iPad carts available to a school of 600 students. Ms. Miles noted why they used the ESL Department resources the most:

Because we have first rights to it. The school-wide things you have to make sure – you can't use it every day because it's shared with the rest of the school. ... – there's not a set how many times you can use it [school-wide available technology], but maybe about once a week on average would be acceptable to recognize that other people need to take turns. (Ms. Miles interview, 02/13/2013).

According to what the teachers mentioned in the interviews, the ESL Language Arts period classes—the only bell period in which all three teachers taught at the same time—had to share the available laptops and the iPods. During the other class periods, only one teacher and her class used the four laptops and 15 iPods, as the other two teachers either had planning periods or were working

with mainstream teachers in collaborative classes. However, this situation might have been different during other school years or semesters when the schedule was different.

**Technology malfunction.** Sharing of available new technology often happened when technology malfunctioned and the teachers needed a backup plan. Malfunction of technology is an instance teachers face when integrating technology in the classroom (Lu & Overbaugh, 2009; Howley & Howley, 2008). For example, during one class observation in Ms. Miles' class, one student, who was using an iPod to record and then listen to his reading for reading fluency practice, noticed his iPod was not charged. The student showed the iPod to Ms. Miles and Ms. Miles asked him to go next door to Ms. Wong to get a charger. The student then did so. Ms. Wong was not alerted in advance in any way that the student would come to get a cord, except for the general mutual understanding the three teachers had about sharing what they had among themselves. Ms. Miles noted:

Well, I'm a teacher so I'm flexible and we always have a backup plan.... I can quick run next door and borrow something from another teacher if I notice it [the technology not working] quick enough or we'll readapt the lesson. (Ms. Miles interview, 10/26/2012)

This technology sharing demonstrated flexibility on behalf of the teachers. This example illustrates how technology sharing happened as the needs of the students or of the classroom situation arose. For this cordial and friendly sharing of available resources, the good relationships among the three ESL teachers helped.

**Technology affordances.** As mentioned in the introduction, technology in the language-learning classroom could be used in multiple ways to support student learning. Based on observations, student laptops seemed to be the most shared technology among the ESL teachers. The teachers themselves also thought they shared the laptops the most: due to their limited number (only four) and their affordances. In one of her interviews, Ms. Miles said:

...because there's only three of them [laptops; the fourth one being borrowed from the library] so we have to kind of keep shifting them and there's just more versatility with the laptop. You can do audio things, you can do computer programs, you can do typing or PowerPoints as ways to create projects so they have the most options whereas compared to the iPods are good for apps or for voice recording but not for everything. (Ms. Miles interview, 02/12/2013)

Ms. Jones also highlighted the various affordances of laptops: "...we have a lot of good web sites and a lot of resources that are Internet-based..." (Ms. Jones interview, 02/13/2013).

According to Ms. Wong, the county gave each of the ESL teachers in the district a choice of getting two iPads or a laptop for their classes. All three of them, Ms. Jones, Ms. Miles, and Ms. Wong, chose laptops instead of iPads and Ms. Wong said they were pretty happy with their choice. Ms. Wong considered the laptops were better for typing than the iPads due to the presence of the physical keyboard and that students viewed the laptops more educational than the iPads which had various apps such as games and pictures which could easily distract students from their work.

### **Practices of Sharing Available Technology**

Based on the observations, the three ESL teachers seemed to share laptops in a friendly and informal way. One day, for example, I was in Ms. Jones' classroom before class started. It was a day when 7<sup>th</sup> graders from West Middle School had a field trip planned. While Ms. Jones was waiting for students to arrive, Ms. Wong, who was going on the field trip with her students, entered the room

and asked Ms. Jones if she needed the laptops for the day. Ms. Jones replied that she did not need them, but Ms. Wong insisted that she would bring them anyway just in case Ms. Jones needed them later in the day. This situation illustrates how two of the ESL teachers, Ms. Jones and Ms. Wong, thought of sharing the four available laptops for students' benefit.

The three teachers acknowledged how well they worked with each other and how easily they shared the technology they had access to: "So we normally end up talking as we switch classes or as we're in ... [end of school block] together or right after school or right before school. So it's usually just a quick, 'Hey, are you using them [the laptops] today?' 'No.' 'Okay, then can I?'" (Ms. Wong interview, 12/06/2012). Ms. Jones and Ms. Miles also noted they might email the two other teachers letting them know they needed the laptops. Ms. Wong mentioned the three of them worked well together: "We're more like, we have all of these ideas. Okay, if I don't have the laptops today, I'll save that for tomorrow and I'll do this other thing today ..." (Ms. Wong interview, 12/06/2012). Ms. Miles talked about being flexible and adaptable so that technology was shared well:

...we all have a desktop in our room and our classes are small. So usually if that would happen [two of us to need all four laptops], we would say, 'I'll take two and you take two. We'll have students partner up.' We have enough of a plan in place that we could adapt....But usually we're not planning to use the computers for the entire class, the whole period." (Ms. Miles interview, 12/06/2012).

This statement shows how considerate the teachers were of one another and what strategies they developed to make sure the resources were shared as needed. It also shows how the teachers helped make the technology easily accessible for each other.

### **Implications and Recommendations**

Based on these findings, I am presenting several general implications and recommendations related to technology sharing. The context for this study was a public middle school in the U.S., but the implications and recommendations could be applied to other schools and contexts where there is available technology teachers might need to share.

### **Strategically Planned Schedules**

In case technology needs to be shared, as it was the situation for the three ESL teachers, it would be useful for administrators and teachers to think about teacher schedules and available technology and their impact on sharing at the school and/or department levels. If possible, scheduling classes in such a way as to maximize the availability of technology to teachers and students would be beneficial. A clear schedule of available technology would be helpful for teachers to have in addition to the opportunity to switch and swap time slots to accommodate various planning and instructional needs. Administrative support is an important factor in technology integration in schools (Hew & Brush, 2007) and planning classes strategically to optimize technology use would be one option. In addition, new one-on-one digital initiatives that have recently increased in the U.S. districts (Grenslitt, 2015) would be an option.

A good relationship between the teachers as well as consideration of the other teachers' instructional technology needs would also help with technology sharing. Obviously the good relationship between the three teachers in this study facilitated an easy and informal way of sharing the available resources. The three teachers talked about a more formal schedule of using the ESL Department laptops, but that was a tool they never needed. In case of departments who do not have very close relationships, scheduling technology use is a good alternative. Administrators and

department heads could play a vital role in creating spaces and opportunities for teachers to develop good relationships and plan their technology sharing themselves based on their needs, planning, and usage.

### **Troubleshooting and Back up Plans**

Sharing the available technology is helpful especially in case of technology malfunctioning episodes as was the situation described above in the findings section. Fear of technology not working properly or of not having technical support are factors influencing the lack of integrating technology in the classroom (Howley & Howley, 2008). If teachers can borrow and know they can borrow a piece of equipment any time from their peers in case of malfunction, they can continue the lesson with minimal interruption rather changing the lesson or omitting technology from it. Another alternative might be to have back-up parts available and/or train the teachers how to troubleshoot common technology malfunctioning episodes.

### **Technology with Most Affordances**

Both teacher interviews and classroom observations showed that laptops were used the most of all the available devices. Laptops might be more expensive than iPods for example, but if laptops are used the most, it is recommended that further investment be made in the technology that is mostly used. It is important to know and notice which technology has the most affordances and has the potential to be used the most in the classrooms: asking and observing teachers in their classes will provide useful information on which technology is used the most and thus is worth investing (Yang & Walker, 2015).

In case of limited or not enough availability of technology in schools, teachers and administrators have the opportunity to think and plan ways to maximize the available resources to the benefit of the students. Although this study focused on ESL Language Arts classes the recommendations above could be extended to other classes and departments.

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**Note:** This article is based on my dissertation (it is a part of my dissertation project). Currently my dissertation is embargoed until 2018.

1. Not all ELLs in the US are identified as Hispanic