Criteria Language Teachers Use When Selecting CALL Technologies

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ARTICLE INFO	ABSTRACT
	It is important to identify the criteria that language teachers consider when selecting technologies. Software designers and developers, program administrators, and others need to be aware of adoption issues and practices for CALL technology. The focus of this case study was to look at six language instructors considered to be experts in their use of technology in the classroom and examine the criteria they use when selecting CALL resources or activities in the classroom. Interviews, recorded classroom observations, and analyses of teaching materials resulted in three themes: consideration of pedagogy, consideration of convenience, and consideration of authenticity. These are discussed in the context of language teaching, CALL materials development, and language program administration.

Since the beginning of computer-assisted language learning (CALL) research, researchers have emphasized studying the technology use of autonomous language learners, alternate language learning environments, types of technology used in the classroom, and teacher perceptions of technology use. While much has been revealed about these topics, less is known about the criteria language teachers use when selecting the technology they utilize in the classroom.

Identifying the criteria that language teachers consider when selecting technologies may help inform software and hardware designers, developers, program administrators, and other language

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teachers curious about their own technology use. With a better understanding of such criteria, the quality of software developed may increase as designers keep the values of users in mind. If technology enhances language learning, administrators can make decisions based on the values of those who effectively use technology. Ultimately, teachers are the gatekeepers regarding technology used in the classroom. When teachers are aware of the criteria used in utilizing technology in the classroom, their ability to make informed decisions regarding technology use may increase.

The primary research question driving this study is: What criteria do language teachers consider when selecting and using technology to enhance language learning? By criteria, we refer to any factor that teachers consider in selecting technologies, including both barriers and motivators. Thus, we seek to understand the evaluation experiences of teachers with regard to technology use as well as non-use.

2. Literature Review

Literature on language teachers' use of technology presents various issues that may influence how technology is utilized in the language classroom. Teacher education, attitudes, experiences, confidences, and perceptions all seem to contribute to the use of technology in the classroom.

2.1. Teacher Attitudes toward Technology

Egbert, Paulus, and Nakamichi (2002) asked how teachers' learning about CALL-based activities in their coursework impacted their current teaching and what factors influenced computer use. They surveyed and interviewed 20 language teachers and asked them how they learned about CALL activities. They found that teachers usually learn about technology use on their own and that coursework is generally decontextualized. The strongest factors influencing computer use were lack of time and resources as well as other curricular or institutional restrictions. While these provide valuable information, they say nothing of the criteria teachers use when selecting CALL materials.

Similarly, Kessler (2007) explored the attitudes of teachers toward technology and the type of CALL training they received. He described formal training as the instruction teachers might receive in a classroom setting and informal training as the education received through personal experiences and self-study. He surveyed 108 graduates with master's degrees in teaching English to speakers of other languages (TESOL) and found that teachers are more influenced by informal training in CALL than they are by formal education. He argued that if teachers continue to learn in this informal setting they "may not be able to exploit the resources and learning opportunities available to them as CALL continues to evolve" (p. 184). In other words, according to Kessler's research, CALL training needs to facilitate informal training and provide formal training to help teachers not only keep abreast of the latest developments in software and hardware that can be used in CALL, but to think critically about the technologies used and their specific implementation.

2.2. Teacher Experience with Technology

Another factor influencing teachers' technology use is their experience. Meskill, Mossop, DiAngelo, and Pasquale (2002) conducted interviews to understand the differences between those who use technology and those who do not. They interviewed experts and novices alike. Perhaps the most interesting finding reported in this study is that novice teachers who had received cutting-edge training in computer use felt less comfortable in their integration of technology in the classroom than teachers with more teaching experience and less current training. While not explicitly stated in the publication, the researchers hint at the benefits of learning effective classroom practices from experienced teachers in order to better integrate technology into the language classroom.

In addition, Wetzel, Zambo, and Ryan (2007) observed K-8 classrooms of both experienced and beginning teachers. They found that experienced teachers used technology more often in their classroom, but could not provide a reason for the phenomenon. They suggest that the number of years teaching might affect the use of technology, but it may also be related to a combination of factors involving both experience and confidence, among others.

2.3. Teacher Confidence in Technology Use

Teacher confidence also influenced teachers' use of technology. Kessler and Plakans (2008) explored teacher confidence and CALL with regard to use and attitudes of digital audio and video. Their approach involved logging classroom practices and interviewing seven ESL teachers. These teachers were selected not because of their expertise in CALL but because they used technology in their classrooms. Through interviewing the participants, the researchers identified them as highly confident, contextually confident, and less confident. They found that highly confident teachers don't use digital audio and video regularly and often only do so because they are required. Contextually confident teachers tended to be more "reflective [and] cautious in use" (p. 278) of technology and integrated it more frequently in the classroom. They found that less confident teachers' use of digital audio and video resembled their prior use of analog media. The study provided useful information regarding technology confidence and use, but did not attempt to clarify how the teachers choose the materials that they use.

This was similar to Brantmeier's (2002) findings. She surveyed and interviewed ten Ph.D. students in a semester-long seminar on CALL and found that they proceeded cautiously when using technology in their classrooms. Furthermore, teachers well-informed by second language reading and CALL theories developed positive views on technology use for reading instruction.

2.4. Teacher Perception of Computer Use in the Classroom

Finally, Kim (2008) investigated ESL and EFL teachers' perceptions of computer use in the classroom. She asserted that much of the CALL literature assumes that the benefits of technology use would promote a constructivist approach to learning rather than the typical teacher-centered approach. After interviewing 10 teachers for 50 minutes each and using a grounded theory approach for data analysis, Kim concluded that teachers viewed the use of technology primarily as an instructional tool. While the author illuminated an important facet in teachers' experiences, the participants had similar backgrounds and abilities with technology that may not have painted an accurate picture of teacher experience at varying levels of expertise in technology. Additionally, the interviews probed their perceptions and did not focus on the choices and processes that these teachers undertook when using CALL. While not the purpose of the study, this information might prove helpful in understanding their perceptions of technology use.

In summary, these studies focused on teacher factors that influenced technology use in classrooms. If teacher education programs want future teachers to use technology effectively, the technology courses need to be hands-on (Egbert, Paulus, & Nakamichi, 2002; Kessler, 2007; Meskil, Mossop, DiAngelo, & Pasquale, 2002). They also need to give future teachers a sound foundation in pedagogy so that technology use enhances learning (Brantmeier, 2002; Kessler & Plankans, 2008; Kim, 2008). Educators cannot depend on formal training as a determining influence in CALL usage by prospective teachers. Additionally, educators should not depend on informal training as the definitive resource for CALL education.

Despite knowing factors that affect technology integration in second language classrooms, such as formal and informal training, there is a dearth of research that actually explores the decisions teachers

undertake in the selection of CALL materials and activities. We know little regarding the questions that teachers ask themselves when choosing to use specific CALL-mediated instruction. We know who uses CALL technology and what technology they use, but do not know the why. The purpose of this study was therefore to reveal the standards and criteria teachers use to select CALL materials and activities.

3. Method

The following section outlines the research design and describes the research site, participants, methods used, and data analysis processes.

3.1. Design

The theoretical perspective underpinning this multiple case study (Stake, 2010) is based in phenomenology. This emic approach lends itself to a description of particular phenomena through the eyes of the participants. Likewise, it limits the amount of external judgments made by the researcher while collecting data. Van Manen (1997) described the researcher as the instrument for collecting data who must set aside his own perceptions and judgments while collecting information (i.e., epoche). The process becomes more etic as the researchers strive to reconstruct the experiences while staying aware of their own subjectivities. The purpose of this study was to discover the criteria language teachers consider when selecting and using technology to enhance language learning. Observing and describing each case helped us to identify criteria these expert teachers use when selecting CALL resources and activities for use in the classroom.

3.2. Research Site

Brigham Young University has a long history of language teaching and learning. The university reports that 50 languages are regularly offered to students, with 30 more taught on special request. An astounding two-thirds of BYU students speak a second language. BYU also reports that 31 percent of all students are enrolled in language classes each semester (BYU, 2012).

Additionally, BYU has a strong history of support for CALL. As early as 1973, scholars at the university were studying computer-assisted instruction, and, more specifically, TICCIT (Time-shared, Interactive, Computer-Controlled Information Television), one of the most used CALL approaches of its time (Bunderson, 1974). Other highly successful CALL-specific packages, such as CLIPS (Computerized Language Instruction and Practice Software) and ELLIS (English Language Learning and Instruction System) were also developed at BYU. In 1983, Hendricks, Bennion and Larson published an article in the then newly created CALICO Journal describing technology and language learning at BYU. With such a storied and rich tradition of language learning and CALL specifically, BYU was an ideal context for investigating teachers' criteria for use of technology in language learning.

3.3. Participants

We used extreme case sampling (Patton, 2002) to identify those teachers who effectively use technology in the language classroom. In this study, we refer to these participants as expert technology users. As reported by Kessler (2007), experienced teachers tended to be the ones that felt most comfortable talking about their technology use, so we searched for participants who were experienced language teachers. Additionally, teachers who are frequent users of technology have more experiences selecting and evaluating technology. Selecting participants who are expert technology users and who have experience teaching language helped us to get more information regarding evaluation criteria than novice

teachers or teachers who rarely use technology. In other words, our definition of expert and novice technology users does not refer to the number of years of experience teaching that the participant has. Our teachers all had at least one year of experience teaching, but were selected because of their perceived use and proficiency in using technology.

We first looked at the 34 languages that would be taught during the semester the research was conducted. We targeted the departments where several teachers taught the same classes due to the wide variety and the likelihood that there would be a definite outlier in terms of a teacher who was an expert user of technology for language learning. We approached department chairs and course coordinators in those departments and explained the proposed research. We then asked these individuals to identify the instructor for each language that was taught in their department that would qualify as an expert technology user. A few departments chose not to participate. Six participants were ultimately selected for this study, representing teachers of Spanish, ESL, Arabic, Mandarin Chinese, German, and Russian.

3.4. Subjectivity Statement

All members of the research team are affiliated with BYU, as are the six participants. We wanted to learn more about the perspectives of our peers when dealing with CALL and felt that the better we understood the perspectives of other teachers, the better we could develop and implement CALL materials. One member of our team had previously taught ESL with two of the participants prior to the study. Another team member taught these same two participants in a graduate course for ESL teachers.

Knowing two of the participants, and sharing affiliation to BYU, may have allowed us to have more open, candid, and comfortable discussions. It allowed us to understand their perspectives in a more formal and methodological way with data that could be analyzed and synthesized to help us all gain a greater understanding. However, while there was the possibility for open communication and the collection of rich data, some participants may have felt uncomfortable sharing their teaching experiences, which may have limited some of the data collected. Our relationship with the participants had no negative affect on their job status. All the data was kept confidential.

3.5. Procedures

The primary data collection was done through three interviews with each of the participants. Stake (2010) stated that interviews can help researchers find out about "'a thing' that [they] were unable to observe themselves" (p. 95). Each semi-structured interview lasted approximately 30 minutes, and together served as a form of triangulation. The first interview focused on the teachers' use of technology. These interviews provided a broad overview of the participants' experiences and helped them articulate their teaching philosophy with regards to the use of technology and language learning. We conducted these interviews the week before observing each teacher.

Prior to the second interview, we observed and recorded the teachers in one of their classes for one week and reviewed the materials used in those lessons. During the week following the observations, the participants and a member of the research team reviewed selected portions of the video recordings. These recordings and materials were used as stimulated recall to help the teachers focus on past activities rather than speculate about what they may have done.

The third interview was conducted after analyzing the first two and included triangulation with participant observations. Themes or topics that emerged from the previous interviews were addressed and participants had the opportunity to offer any other information that they felt was pertinent to the study. This interview served as a member check (Stake, 2010) to verify the accuracy of our synthesis of the collected data. Each participant was sent a copy of their individual case and asked to review it prior to the

interview. A member of the research team asked for clarifications or changes that would make the synthesis more accurate. We conducted these interviews about eight weeks after the second interview and toward the end of the semester during which the observations took place.

3.6. Data Analysis

After each interview was completed, we coded the data using the exact words of the participants to identify key points. Moustakas (1994) and others (Reid, Flowers, & Larkin, 2005; Smith, Flowers, & Larkin, 2009) provide suggestions for phenomenological data analysis. These include an emic description of the participants' experience followed by an interpretive step involving the etic perspective of the researcher.

Coding consisted of sorting and classifying data, which in many regards involved both analysis and synthesis. We broke down the data using the participants' words (emic) and reconstructed it into meaningful themes (etic). The reconstruction into themes allowed us to reveal and describe the variation we observed. This combination of emic (textural) and etic (structural) approaches provided us with the means to make a holistic interpretation of the key aspects of a lived phenomenon, which we present as cases or vignettes.

After the data were saturated with emic codes, adding our etic codes allowed us to group these coded terms into categories. We then put the data back together by correlating the emic and etic codes to help inform the final step: the identification of themes.

In order to ensure credibility of the analysis, we performed member checking during the third interview. Hatch (2002) suggested providing the participants with a draft of the summary. The participants reviewed the summary and we discussed any discrepancies or incongruities in the new, shared perspective of the criteria used by teachers to select CALL technologies.

4. Vignettes

The following vignettes illustrate the experiences of the participants. We have incorporated direct quotes that we have selected based on themes from the data analysis. Pseudonyms are used to preserve anonymity. At the beginning of each case, we provide a brief background of each of the teacher participants—Justin, John, Shada, Hsui Ting, Bettina, and Jessica. While these teachers have much in common, they are all at different points in their careers as language teachers. Nonetheless, they have all been identified as expert technology users by their corresponding department chairs. All the teachers, except for Justin, taught in a classroom with an LCD projector, a computer station, and wall-mounted speakers. Justin was the only teacher with an overhead transparency machine; all other materials had to be checked out and brought to his classroom.

4.1. Justin

Justin is a full-time instructor at the English Language Center (ELC). Four class sessions were observed and recorded during one week of an intermediate-mid listening and speaking class. Students in the class came from various countries and spoke several different languages.

Justin made several remarks indicating that effective pedagogy was of utmost importance when choosing whether or not to use technology in the classroom or choosing between two technologies. Justin's main concern was for the learning that should occur. In his own words, he described his philosophy toward the use of technology in the classroom: "The software doesn't guide the learning exercise—I guide the learning exercise."

Justin preferred to use new/advanced technologies in the classroom, such as LCD projectors, but the lack of hi-tech hardware in the classroom hindered his ability to use technology as he wished, so he used overhead projectors. He said, "It's much easier for me to bring transparencies than it is to bring up a projector." Reserving, checking out, and transporting equipment took time and effort that, in many instances, was additional work that didn't result in additional benefit. Justin took his classes to the computer lab fairly regularly. With regard to criteria he considered before selecting hardware or software for his students to use in the computer lab, he said that both his own familiarity with the technology and his students' familiarity played a vital role in his selection process. Justin commented that when introducing something unfamiliar to the students, it is important to consider the time investment in teaching them how to use the hardware or software and the amount of learning that will occur as a result of using technology. For example, he preferred the simplicity of Quicktime for audio recording. The software is limited to recording audio, video, and screencasts. He argued that the time it takes to prepare students to use it was minimal and the chances of them doing something wrong was quite low.

One activity that students engaged in at the ELC was elicited imitation (Cook, McGhee, & Lonsdale, 2011). Students listened to a sentence and then repeated and recorded themselves saying the sentence. The software was then able to provide feedback and projected proficiency scores based on their repetition of several sentences. Justin said he used this software because, "it was created for that specific task." He explained that when software is geared to a specific task it is easier for students to stay focused. There is little distraction in the software and little time needed to train students to use it.

Overall, Justin made use of various technologies, both low-tech and high-tech. He was comfortable with technology usage and his ability to use it for his pedagogical purposes.

4.2. John

John is a graduate student in the Spanish and Portuguese Department. We observed five class periods during one week of a third year Spanish course. His students are native English speakers. During this semester, he offered to participate in a pilot program that integrated an authentic television series into the curriculum. At the time we observed him, John was also working on a graduate thesis exploring social media in the language classroom.

John felt that as a non-native Spanish speaker, pulling in audio and video generated by native speakers in authentic situations was essential to enhancing his students' learning. He also used authentic video and audio to give students insights into the culture of the target language. John summed up his view of the importance of good pedagogy and technology: "[Technology provides] really good access to authentic material. Authentic materials, from a language perspective, are what we need to get to our students." He added that, "successful technology use depends on good pedagogy."

In contrast to Justin's situation, John had a computer and LCD projector in the room where he taught. He used the LCD projector to play audio and video, show pictures, and do interactive activities. When we asked him why he chose an LCD projector over an overhead projector he stated that he "doesn't even know how to make transparencies." Using the computer and LCD projector was easier and more convenient for him.

During the class periods we observed, John used several videos. He reported that when he chose which videos to use, it inevitably came down to whether the video provided the language needed to meet the intended learning outcomes. He also noted that all activities do not need to be based in technology, and that varying the types of activities, in addition to having the learning outcomes in mind, results in better teaching.

Although John made good use of the whiteboard in his classroom, we asked him why he used PowerPoint presentations to display grammar rules and examples instead of a handout, an overhead

projector, or the whiteboard. John felt that the PowerPoint presentations were more helpful. Even if the grammar materials were written before hand, writing on the board would take an extra step. Additionally, John valued the time he had to prepare the presentations because it allowed him to prepare effectively and focus on teaching in class rather than simply presenting material. John found it much more convenient and helpful to students to show PowerPoint presentations in class and then post these presentations to a learning management system for the students to access outside of class via the internet.

Through the observations and interviews, it appeared that John really only used one technology that was specifically purposed for learning language. A group of teachers, researchers, and developers were piloting the use of a website in some of the Spanish courses. The website provided authentic video from a popular Hispanic television program. The website was accompanied by other learning materials and assessments which John used. John's participation in the pilot study matched his philosophy about using authentic language in the classroom. Moreover, he emphasized that authenticity is not just language spoken by native speakers, but language spoken to native speakers.

4.3. Shada

Shada is a native Egyptian Arabic teacher who works in the Asian and Near Eastern Languages department as an adjunct Arabic teacher. We observed a second year Arabic class that met five days each week. Two of those class sessions each week were presented in a different format involving a larger number of students from various sections taught by other instructors. By her request, we limited our observations to the three traditional class sessions Shada was teaching.

During our observations, Shada did not use presentation software such as PowerPoint. In fact, most of the written language presented to students was written on the whiteboard. She felt it was worth taking the time to write on the board so that students can "see the handwriting." As a teacher she felt that it was important that her students become familiar with Arabic handwriting. She wanted them to be able to see how to write the characters. In this situation, Shada opted to forgo the use of technology in favor of a perceived learning benefit to the students.

The Arabic language curriculum in the department was supported in part from a textbook series. The textbooks came with a DVD that has video and audio of native speakers interacting. While Shada did not use all the available language samples, she selected videos based on their authenticity and relevance to the cultural or linguistic feature being taught in class. Rather than show the videos because they came with the textbook or because they were interesting, Shada used media only when it fit with what she was teaching. Shada added that, "sometimes showing a video can be a waste of time if it is not serving its purpose." When selecting recorded language samples for use in the classroom, her priority seemed to be on the learning task. While she realized that the audio samples that come with the textbooks were not necessarily authentic, Shada recognized that the scenarios and vocabulary were authentic to the tasks her students would do in class.

4.4. Hsiu Ting

Hsiu Ting is full-time faculty in the Asian and Near Eastern Languages department where she teaches several classes in Mandarin Chinese. During the semester we conducted the study, she was teaching a current events media-based class.

Hsiu Ting acknowledged that she loves technology, but asserted that "[Technology] is an assistive tool. It's not the primary purpose [of the lesson]." During the interviews, Hsiu Ting alluded to language learning principles that guided her teaching. She emphasized that pedagogy is a strong factor in predicting the outcome of technology-based activities.

When teaching a class that focused on current events, Hsiu Ting strongly believed in the use of authentic materials, including news broadcasts. In most cases, she would provide the class with a scaffolding exercise to prime them for the listening passage provided by the broadcast. She would play the authentic passage a few times and stop to check for comprehension both during playback and between repetitions. In some cases, comprehension questions were included on a handout or discussed prior to listening or during it.

Much like Shada, Hsiu Ting used the whiteboard to help her students learn how to write Chinese characters. "Students need to learn how to write the strokes—the particular stroke order. Sometimes they think they write it correctly, but they don't." Using the board to both show students how to write Chinese characters and allow students to practice during class was more important to her than using technology that may or may not have helped students reach the same intended learning outcome.

Unlike Shada, Hsui Ting made extensive use of PowerPoint presentations. She recognized that some students may have had trouble understanding the handwriting of others and wanted to provide those students with comprehensible input. Like John, she saw PowerPoint as a tool that aided in preparing pedagogical lessons because it helped her organize her ideas and focus on the specific language tasks the students would engage in. Hsiu Ting found it more convenient to have her materials in a digital format. She explained that it was easier to carry around a USB drive with materials for the different classes she taught than it was to lug around hard copies of all the materials.

We asked Hsiu Ting what technologies she regularly used in her teaching and one of her responses was that she used to have a class website. Upon further questioning, she indicated that dealing with website security issues and maintenance was not enjoyable so she began to use Blackboard and dropbox as ways to communicate with students and provide them with materials they needed in class. She found these alternatives to be more accessible to her students and easier for her to maintain.

4.5. Bettina

Bettina is adjunct faculty in the Department of German Studies and Slavic Languages where she teaches German classes. The semester we conducted the study, she was teaching two sections of a third year German course that met three times each week.

When asked about her approach or philosophy toward the role of technology in her language classroom she said, "the more [technology] the merrier." Bettina said that she uses technology until "it gets in the way" of language learning. She emphasized the importance of fostering communication in the classroom and practicing the target language. She noted that sometimes "you have to turn it off" and start talking. "In a language class, you need to talk as much as you possibly can."

Throughout the observations, Bettina made extensive use of the LCD projector to show documents, images, and videos. She felt that being able to point at a document and indicate which part of the text they were discussing helped eliminate confusion and made the class flow better. Students could spend more time in the text instead of asking where they were in the text.

In several instances, Bettina used a Microsoft Word document. She mentioned several factors that governed her decision. When using a Word document instead of the chalkboard, she had her face to the class and she felt that she was in a better position to interact with the students. She also mentioned that what she wrote in a Word document could be saved and shared later with students. The students might spend less time jotting down hurried notes and more time interacting with their peers and the teacher, knowing that the notes on the screen would be available later.

The class that Bettina was teaching during the study had a literature component. Bettina mentioned that many of these texts were available online and that she provided students with links to the text rather than printing copies for each student. When selecting texts to be used in class, she reported that

she first chose the literature and then looked to see if the text was available online. She first considered the content needed to teach students and then looked for a technology solution.

4.6. Jessica

Jessica is full-time faculty in the Department for German Studies and Slavic languages. She teaches a variety of Russian classes. We observed a first year Russian course that met daily. A teaching assistant taught two times each week. We observed the three days that Jessica taught the class.

Regarding her approach to technology usage in the language classroom, Jessica stated, "technology should always be used in pursuit of a goal and not for the sake of technology itself." For each activity that Jessica used in the classroom, she articulated its pedagogical foundation. She could clearly explain without hesitation the pedagogical benefits of each technology she used. For example, she quickly pointed out the visual, aural, and tactile benefits when using individual whiteboards in class. Students listened to the target language and produced the target language through writing, which provided different experiences with the language that may have catered to variations in students' learning styles.

Like Shada and Hsiu Ting, Jessica felt that providing the students with opportunities to write the characters of the language was important. She mentioned that having the students use a computer would be less helpful because the keyboard in the classroom did not support Russian language input. In this situation, only one student would be able to type at a time. Instead of using a hi-tech alternative, Jessica opted to use the whiteboard for practical and pedagogical reasons. She took this a step further in her class by bringing a small whiteboard, markers, and erasers for each student to use simultaneously to share their practice with the rest of the class. "I like that for pedagogical purposes—it gets me immediate feedback. Everybody is involved and it is multi-sensory."

At the beginning of each class, she used the projector to display English words on the whiteboard next to which the students would then write the Russian translation. Because she worked with a teaching assistant for this class, the two would often need to coordinate the words to be displayed. Once Jessica knew which words to use that day, she created a PowerPoint presentation to project the words on the whiteboard during class. By the third observation, she stopped doing this activity in this fashion because the amount of effort to prepare for this activity was more than the resultant learning. Instead she shared a word document with the teaching assistant that contained an updated list of words. As class was starting, she referred to the document and wrote the words on the board. Both Jessica and the teaching assistant were able to accomplish the intended learning outcome with less effort than they had given previously.

5. Findings

Following the analysis method previously described we coded the data collected through interviews and observations. From this analysis we identified three emergent themes: consideration of pedagogy, consideration of convenience or accessibility, and consideration of purpose and authenticity. These themes were consistent among all participants and across all interviews.

5.1. Consideration for Pedagogy

The pedagogy involved in implementing technology use to learn language was a predominant theme expressed in the interviews with the participants. Justin put more focus on his students' learning and considered the convenience or inconvenience of technology use as it relates to good pedagogy. As mentioned earlier, Justin considered the teacher to be essential in the effective implementation of technology. He said, "The software doesn't guide the learning exercise—I guide the learning exercise."

His implication was that good teaching is defined by the teachers' actions and not the technology itself, an assertion supported by Meskill et. al's (2002) research.

This attitude manifested itself repeatedly. Before considering the use of technology in the classroom, Jessica thought "of the outcomes for the day, the objectives, the material that is scheduled to be covered and then consider[ed] the activities [that could be done] in pursuit of those outcomes." Bettina indicated that if using a particular technology inhibited language learning, it was better to use a non-technology based material or activity. John, Hsui Ting, and Shada all indicated that the language being taught was more important than the technology making it available.

5.2. Consideration of Convenience or Accessibility

One criterion that the participants considered was the convenience or the accessibility of the technology. Convenience, as used here, refers to a few different concepts. First, it is used in the traditional sense—something that can be done with little effort. If something low-tech or no-tech is readily available, and can do the same job for the same or less effort, the teachers would use what was available. Justin, John, Bettina, and Hsiu Ting all talked about this in their interviews. Secondly, convenience refers to the time investment. If preparing to use a particular technology took a significant amount of time or was not easily accessible and only yielded small increases in learning, the teachers chose not to use that technology. Both Bettina's and Jessica's use of the whiteboard exemplify considerations of convenience as well as Justin's use of an overhead projector instead of a computer projector.

5.2.1. Familiarity

Familiarity is a subset included in this theme of convenience and accessibility. An unfamiliar technology or technology-based task was considered to be inconvenient or inaccessible. This involves both the teacher's and the students' familiarity with a technology used for learning. Justin, along with other participants, felt that the more familiar students and teachers were with a technology, the more convenient it was to use it over something with which they were less familiar. Justin stated, "I use [technology I am familiar with] just because I know I will be able to troubleshoot the technology as it's being used and I know that I will be able to present the technology in a way that is the least disruptive."

5.2.2. Reliability

Another subset of convenience focused on the reliability of the technology. During the interviews, each participant mentioned that technology in the classroom was of no value if it failed to function properly. Reliability was a criterion that Jessica felt was important when using technology. She mentioned that she often preferred to make online videos available offline because the hosting website might go down or there might be Internet access problems during class.

5.3. Consideration of Purpose and Authenticity

Purpose and authenticity made up the third theme and were grouped because the participants used them together. The participants frequently elaborated on the purpose of a particular CALL activity or the authenticity of an activity or material. Generally speaking, their purposes of technology use focused on how well the CALL material or activity met learning outcomes by providing authentic language in semi-authentic situations. This could be seen in the teaching of Justin, John, Hsiu Ting, and Shada.

6. Discussion

As mentioned in the introduction, the implications from this study affect several different groups. This section will focus on implications for administrators, teacher educators, CALL software developers, and language teachers.

6.1. Implications for Administrators

Egbert, Paulus, and Nakamichi (2002) reported that the lack of time and resources effected teachers' use of technology. The teachers in this study valued the convenience in their selection of materials for use in the classroom. Lack of time to effectively use technology was an issue of convenience as was the lack of available resources.

1. Make technology accessible: This study highlights the importance of making technology available to teachers. The clearest example of this was Justin's inconvenient access to technology in the classroom. He indicated that he would use an LCD projector more often if it were readily available in the classroom where he taught. The example of the accessibility of an LCD projector is most likely an indicator that expert technology users would use other technologies if they were readily accessible. Administrators should carefully evaluate the effectiveness of such devices for language learning and make provisions for teachers to have easy access to them.

Access to technology is important but in itself is insufficient (Rich, 2012). While, all six cases expressed the importance of convenience with regard to using technology, familiarity played an important role. Administrators should provide training for teachers on the use of technology and make sure they have ready access to that technology to learn and experiment with the software and hardware. This will allow teachers to become familiar with the technology and promote its use in the classroom. For example, Bettina's use of a projector and whiteboard simultaneously might be enhanced by the use of a smartboard. She would need access to a smartboard both during class and outside of class time so she could become familiar with the technology before using it.

Incidentally, the students' familiarity with the technology was also a concern for some of the participants. Providing access and encouraging use of the technology outside of the classroom may prove to increase the effective use of that technology in class. Students in Xsiu Ting's class who may have felt unfamiliar with or apprehensive about using a particular media player for viewing Chinese media may feel more comfortable with the technology when provided ample opportunities to use it outside of class.

2. Make informed decisions: Additionally, participants demonstrated that their primary criterion was student learning. At times, this meant the introduction of a video or a specially-made language technology, while at others it meant the use of a low-tech solution, such as personal white boards or hand-written demonstration of a different writing system. Administrators should consider pedagogy, convenience, and authenticity when purchasing software for their institutions or mandating that a particular technology be used. If administrators of a language program decide to purchase hardware or software, they should ask themselves and the teachers of the program how the purchased product will meet the learning needs of the students. If a language learning application is purchased that will only work on a limited number of devices and makes it difficult for teachers to have access to it, teachers may not use the application as often as intended.

3. Teach principles of good pedagogy: Based on our observations, these expert technology users tended to be good teachers. Administrators should consider teacher training and teacher proficiency of utmost importance. If program administrators want their teachers to use technology effectively, they should ensure that teachers are aware of the pedagogical foundations of language teaching.

Administrators cannot expect that the use of technology will lead to better teaching. They should remember that pedagogically sound teaching can lead to effective use of technology.

6.2. Implications for Teacher Educators

Perhaps the implication for teacher educators is more apparent than those for program administrators. Those who are involved in training new teachers should take note of these three themes. In the studies cited previously, the experiences in the teacher education program were critical to the use, misuse, or nonuse of technology in the classroom (DiAngelo & Pasquale, 2002; Egbert, Paulus, & Nakamichi, 2002; Kessler, 2007).

1. Provide experiences with technology: The theme of convenience has a sub-theme of familiarity. If teacher educators feel that it is important to use technology in the language classroom, they need to help teachers become more familiar with the software or hardware the students will encounter. In the example of the in-house software that Justin used, administrators would also have the role of training teachers to use this software. These trainers need to provide seasoned teachers as well as prospective teachers with the opportunity to use the technology, become familiar with it, and ultimately be able to instruct their language-learning students on how to use the technology in question.

2. Teach principles of good teaching: Teacher educators need to have a strong understanding of language learning pedagogy and be able to help the students under their tutelage gain the same understanding. Egbert, Paulus, and Nakamichi (2002) reported that coursework was often decontextualized but also noted that curricular restrictions inhibited technology use. Teacher educators should help prospective teachers understand how to use technology in conjunction with pedagogical principles that match imposed curricular guidelines. This was also found in the studies by Kessler and Plankans (2008) and Kim (2008), and was strongly reinforced here. A connection needs to be made between the pedagogical purposes and outcomes in a language course and the ability or inability for a particular technology to aid in reaching these purposes or outcomes. Effective users of technology are pedagogically conscientious.

6.3. Implications for CALL Software Developers

On the surface it may seem that there is little software developers can contribute to the pedagogical use or the convenience of CALL software in the classroom. However, there are some key software features that would serve more to promote pedagogically sound language instruction and eliminate possible inconveniences.

1. Consider pedagogy during development: CALL developers should allow pedagogical needs to drive software development. Teachers consider how well the technology will enhance learning and help meet pre-defined learning outcomes. Developers should consult with language teachers, researchers, and pedagogues to identify common language learning objectives that can be enhanced through technology.

2. Ensure that software is accessible and useable: Accessibility and usability are two very important features that CALL developers should consider. This conclusion fits well with a report by Egbert, Paulus, and Nakamichi (2002) that lack of time was an inhibiting factor in CALL implementation. Developed software should require teachers to spend very little time to learn to use it and to teach students how to use it. It should be convenient to use with regard to the time commitment required. Creating CALL software that is accessible on a variety of platforms and devices may not make the technology more convenient for teachers, but it will eliminate a possible inconvenience. A subset of accessibility is availability. High costs of language learning software programs are inconvenient for teachers, students, and program administrations. Even though we conducted this study in a university

with access to educational pricing, none of the participants indicated that they used language-learning-specific software. One exception to this would be the textbooks that come with accompanying software or media. Bundling language-learning software with textbooks may be a way for developers to make it more convenient for their users to use in their teaching. Additionally, software developed in-house is more accessible, provided that the resources are available to have such software developed.

6.4. Implications for Language Teachers

The implications for language teachers compliment those of teacher educators and administrators.

1. Consider learning outcomes first: Because pedagogy was such a predominant theme in this multiple case study, teachers who wish to become expert technology users should evaluate their own criteria when choosing to use CALL. Making pedagogical concerns the first priority will help shape and focus their technology use. It is essential that all teachers consider the importance of student learning outcomes when considering the use of technology in the classroom.

2. Practice good pedagogy: Teachers who base instruction in sound pedagogy are more likely to use technology more effectively. As such, teachers who wish to be better users of technology in the classroom should start by reinforcing the effective teaching practices they currently use and be willing to improve their quality of teaching. Observing other teachers, being observed by others, and video recording their own teaching, are possible ways to evaluate, reflect upon, and improve teaching.

3. Use CALL resources and activities: As mentioned earlier, one sub-theme of convenience was familiarity and this perhaps provides us with the key implication for language teachers: experience using CALL may be a key factor in the use of CALL. If expert technology users select CALL materials and activities based on their familiarity with the technology, teachers who wish to use technology should become more experienced in its use. Meskill, Mossop, DiAngelo, and Pasquale (2002) also reported that teachers with high expertise in CALL felt more confident in its usage. Wetzel, Zambo, and Ryan (2007) also reported the effect of experience on technology use.

6.5. Suggestions for Future Research

Despite the insights provided in this study, it also generated several questions to address in future research in CALL. First, if these criteria— pedagogy, convenience, and authenticity—are used by expert technology users, what criteria do novice technology users consider? In a similar yet divergent topic, is there a correlation or other relationship between teachers who are expert technology users and those that practice good pedagogy in their teaching? Is the practice of good pedagogy a predictor for good technology use? Second, what criteria do program administrators consider when choosing to adopt software or hardware? How do these differ from the criteria teachers consider? Third, what criteria do students consider when choosing to use technology to aid in language acquisition? The results from this study, in addition to future research regarding the criteria used by administrators and students, will further help inform teachers, learners, administrators, and developers in the creation and use of CALL.

Another interesting topic that this study revealed concerns the use of materials that were especially designed for language learning. Three participants used materials that were in varying degrees created for the purpose of language learning. One participant used in-house developed software geared at language learning. Another participant used materials that were part of a language textbook. A third participant used authentic materials that were incorporated into a website used to teach a foreign language. Perhaps the predominant question is who is using what? How many language teachers are actually using CALL- specific materials? What CALL specific materials are language teachers using?

Factors inhibiting or promoting the use of technology in all institutions should be researched. Furthermore, research should be done to investigate the role of administrators in teachers' use of technology as well as institutional factors that may affect teachers' use of technology.

7. Conclusion

The purpose of this study was to identify the standards and criteria language teachers use to select CALL materials and activities. This case study examined six language instructors considered to be experts in their use of technology in the classroom and the criteria they used when selecting CALL activities and resources. Interviews, observations, and analyses of teaching materials generated themes emphasizing important considerations that were consistent across all participants. These include various pedagogical considerations as well as reflections regarding convenience in terms of access, familiarity, and reliability. They also include considerations of the purpose and the authenticity of the learning activities as filtered through the use of technology.

When considering certain technologies, teachers and administrators should first contemplate on the technology's potential impact on pedagogy and learning. For those technologies deemed to enhance learning, such technologies need to be made accessible. It may be beneficial for more teacher educators to provide their students with meaningful experiences using technologies that may enhance learning in the classroom. CALL developers can also help by carefully considering the pedagogical impact of software as its most important contribution. They also need to strive to make software as accessible as possible for both teachers and learners. With a better understanding of effective selection criteria for CALL activities and resources, the quality of software may increase and teachers and program administrators are likely to make more informed decisions about technology use in the classroom.

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