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Exploring Teachers' Use of Technology in Classrooms of Bilingual Students[1]

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Abstract

This article presents results of an investigation that documents teachers' perceptions of the contribution of technology use in classrooms of bilingual learners. Study questions asked how teachers perceive teacher-made digital movies impact learning, and what situational factors delimit technology infusion. Data gathered in focus groups and surveys indicate teachers perceive appropriate technology gives bilingual students greater access to academic language. Results strongly suggest that school administrators control access to technology.

Keywords: Technology, multi-modal instruction, bilingual learners, academic language

Resumen

Es articulo presenta los resultados de una investigación sobre las percepciones que tienen los docentes frente a la contribución de la tecnología en el aprendizaje de estudiantes bilingües. Las preguntas de investigación pretenden conocer la apreciación de los docentes sobre el uso de material digital diseñado por ellos mismos, el impacto que estos generan en el aprendizaje de los estudiantes y los factores situacionales que limitan el uso de la tecnología. Los datos obtenidos a través de los grupos focales y las encuestas aplicadas a los participantes revelan que los docentes perciben que el uso adecuado de la tecnología permite a los estudiantes bilingües ampliar el acceso al lenguaje académico. Los resultados sugieren que los directores de las escuelas controlan el uso de la tecnología.

Palabras Claves: tecnología, enseñanza multimodal, estudiantes bilingües, lenguaje académico.

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Resumo

Este artigo apresenta os resultados de uma pesquisa sobre as percepções que têm os docentes frente à contribuição da tecnologia na aprendizagem de estudantes bilíngues. As perguntas de pesquisa pretendem conhecer a apreciação dos docentes sobre o uso de material digital desenhado por eles mesmos, o impacto que estes geram na aprendizagem dos estudantes e os fatores situacionais que limitam o uso da tecnologia. Os dados obtidos através dos grupos focais e as pesquisas de opinião aplicadas aos participantes revelam que os docentes percebem que o uso adequado da tecnologia permite aos estudantes bilíngues ampliar o acesso à linguagem acadêmica. Os resultados sugerem que os diretores das escolas controlam o uso da tecnologia.

Palavras Chaves: tecnologia, ensino multimodal, estudantes bilíngues, linguagem acadâmica.

Exploring Teachers' Use of Technology in Classrooms of Bilingual Students

In this investigation we collaborated with a group of educators enrolled in a program to satisfy requirements from the State of Illinois in the United States (US) to teach bilingual students. We asked the teachers to integrate digital media technology, Windows Moviemaker, into a lesson designed to promote academic English language acquisition and also focused on formative assessment. Two professors, one with a background in preparing teachers to work with bilingual students, and one who prepares teachers to integrate technology in instruction, guided the educators as they developed their lessons. Besides supporting the educators in the design of their lessons, we asked the teachers to consider their use of technology as participation in a system of activity that includes rules, tools, and people (Engeström, 1987). We involved the teachers in the tasks of creating the technology as well as examining how their school system made it possible or difficult to add a technology component to instruction. Study results demonstrate that it can be an arduous task for teachers to get around protocols in their schools that control access to technology even when they want to do so and believe it benefits their students.

Bilingual Learners in Schools

Student populations are changing in their linguistic diversity and teachers are responding by looking for ways to make disciplinary specific language comprehensible to all learners. In the US approximately a quarter of all children are born to immigrant families (Suárez-Orozco & Suárez-Orozco, 2009). These learners speak about 460 different languages (Kindler, 2002), and the overwhelming majority, some 79.5%, speak Spanish as their primary language (Goldenberg & Coleman, 2010). The teachers who were part of this study were in graduate school as a reaction to their need to learn new strategies to work with bilingual learners. Many were monolingual mainstream teachers teaching students from different language backgrounds at various levels of English language proficiency. Considering the changing demographics, advocacy and quick action are needed to develop and implement curricula to effectively teach academic language and help teachers to design and implement pedagogies that incorporate current technology. Please note that in this article we will refer to bilingual learners as English language learners (ELs).

Academic Language

Researchers support multi-modal instruction for ELs because it provides them scaffolds to understanding with pictures, words, music, and text that adds context to the learning (Chamot, 2009; Echevarria, Vogt, & Short, 2008). Appropriate technology can help a teacher develop this student centered pedagogical approach. Technology can facilitate second language acquisition because it can be used to enhance intercultural communication (Erben, Ban, Jin, & Summers, 2007). Task-based and content language instruction that involves learners as active participants emphasizing process over product came to the fore in the 1990's (Nunan, 1999; Snow and Brinton, 1988). We cannot overlook what research suggests benefits second language learners. With the right technology, ELs can collaborate with classmates to complete interactive tasks that make good sense to them and result in language learning.

We know that it is not easy for ELs to learn the majority language as well as master the content they are taught (August & Shanahan, 2006; Short & Fitzsimmons, 2007). We also know that good teachers address the culturally influenced learning styles of their students (Pang, 2005; Chow & Cummins, 2003). They investigate the ELs' funds of knowledge in order to assure the learner can relate to what is taught (González, Moll, & Amanti, 2006). Multi-modal instruction can be a

medium to offer content-rich contexts that both address and add to ELs' funds of knowledge while focusing on listening, speaking, reading, writing, and discussion (Cummins, Brown, & Sayers, 2007; Kelley, Lesaux, Kieffer, & Faller, 2010). It is important to find the right balance to teach disciplinary content and develop cross-disciplinary skills and strategies (Chamot, 2009).

In addition, Cummins' early development of the basic interpersonal communication skills (BICS) and cognitive academic language proficiency (CALP) dichotomy (Cummins & Swain, 1986), as well as his later work (Cummins, Brown, & Sayers, 2007), suggest ELs need something that technology can help deliver; explicit instruction. Teachers can use many different technologies to scaffold instruction and to engage students in small group collaborative tasks that require listening, speaking, reading, and writing. Because of this multimodal capacity, technology has the potential to allow students to work at their own level and within their areas of strength. When instruction is planned so that students work at their zone of proximal development they can acquire academic language while experiencing low stress levels (Vygotzky, 1986). Movies offer print, music, and visually appealing pictures that deliver an inviting less stressful classroom environment (Krashen, 1981; Erben, Ban, Jin, & Summers, 2007; Lesaux, Kieffer, Faller, & Kelley, 2010). We propose that the sensory contexts of movies facilitate the creation of a third space for productive classroom inter and intra-personal dialogue (Bhabha, 1994). In these spaces, students who are literate, as well as those on the path to biliteracy or multiliteracy can identify the similarities between their linguistic and cultural capital, the teachers', and their monolingual classmates' (Daniel, Taylor, Schwarzer, Garcia, Despagne, Peigne, & Cohen, 2011). Garcia's (2009) definition of translanguaging as acts that give bilinguals access to different linguistic features, supports the use of technology. Her work aligns with what Gutiérrez, Baquedano-López, Alvarez & Chiu (1999) label as hybrid language practices. It seems clear that instruction delivered through appropriate technology has to be beneficial for ELs.

Technology as an Instructional Tool

Hunter (1971) addressed the need to capture the student's attention when beginning a lesson. Technology can be this tool that adds context to the learning. It also supports thinking because it asks a learner to use short and long-term memory. Short-term memory involves listening and seeing (Norman, 1982) while long-term memory asks the learner

to retrieve and use acquired knowledge without conscious monitoring. When ELs interact with new language numerous times, ideas can pass from short to long-term memory. Technology affords ELs the scaffolds to develop control over a text through this processing of auditory and visual input (Norman, 1993). Norman argued that learning is a balance between acquiring, retaining and retrieving information (1982; 1993). We know that acquiring fluency in a new language is a taxing process that requires both a conscious and unconscious focus on language (Krashen, 1981; 1982). Until an EL can unconsciously retrieve and use a second language, he/she needs explicit instruction. Technology can help a learner travel down this path of consciously focusing on language to using it. Use of technology in instruction can help the EL reach the state of flow (Czikszentmihalyi, 1990; 1998) when he/she is immersed in an activity to the degree that everything else fades into the background and self-consciousness disappears. It appears that technology infused instruction expedites this process.

Research Questions

In this study, we identified a population of teachers who had enrolled in graduate school to learn how to better work with their populations of ELs. We used a modified design-based research approach (Wang & Hannefin, 2005) and basic elements of Engeström's (1987) AST model in an attempt to identify insiders' perspectives on specific factors supporting or inhibiting the use of technology in classes with ELs. The questions that guided this study were:

1. How do teachers perceive teacher made movies help ELs develop academic language?
2. What factors control teachers' use of technology?

Methodology

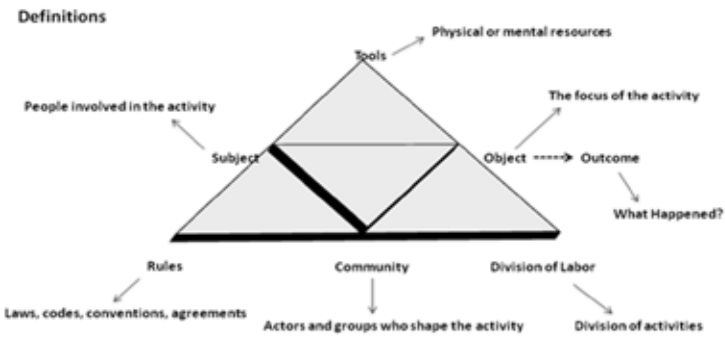
Participants were 26 teachers, 2 males and 24 females from rural areas of the state of Illinois in the US. Fifteen taught at the elementary level, nine worked at the secondary level, and two were middle school administrators. What the teachers had in common was that they were completing coursework to become highly qualified to work with ELs. They were enrolled in their sixth graduate course together. Course delivery was in a format of four face-to-face sessions and ten on line classes. One participant was Latina, three were English Spanish bilinguals, and the rest were monolingual English speakers. The

teachers represented 16 different school districts covering a range of approximately 150 miles. All schools were at least 40-50 miles from the city of Chicago, IL. The teachers were part of a grant project focused on preparing teachers to work with ELs in rural school districts.

We showed the teachers how to use the Microsoft Windows Moviemaker application. Their task was to work in teams over a period of four months to design and each teach one lesson to ELs with identified English language and content objectives. The lesson would include a performance assessment task and a pre and a post-evaluation of learners. The teachers could choose to incorporate their movie any time during their lessons; as part of or after the anticipatory set, and/or as an assessment tool at any point in the lesson.

We told the teachers their role was to be participants/collaborators in the research. We used the term collaborators out of respect. Many of the teachers had master's degrees and were well-seasoned educators. They were pleased that we valued their expertise. We shared the study's questions and explained their role during class time. We enrolled the teachers in our research by explaining that they would be asked to write reflectively about their experience of integrating technology. We showed them Engeström's AST triangle as a model for capturing activities (1987) and explained its components. Refer to Figure 1 for a pictorial definition of tools, rules, and labor.

Figure 1. Engstrom's AST Triangle



Data Collection and Analysis

Each participant completed an open-ended survey and participated in a focus group of ten people. Survey prompts asked the teachers to share what supports or inhibits their use of technology with their students, and to evaluate the effects of the technology use on ELs' learning. The

teachers were asked to examine their students' learning informally and not with a summative examination. Focus group questions involved the teachers in a conversation related to their experience designing, creating, and using the movies. Refer to Table 1 for the questions used in the focus groups.

Table 1. Focus Group Questions

What types of technology do you use in your teaching?
Besides for teaching, how do you envision using your new found skill as a movie maker?
What did you learn from this experience?
How did adding the movie impact instruction?
Will you show your ELss how to make their own movies?
What types of technology do you require your ELs to learn and use in their assignments?
What would make it easier for you to use technology in your teaching?
What is unique about using technology with ELs?
What technology challenges do you encounter in your teaching?

The focus group conversations were analyzed qualitatively and quantitatively in order to identify recurring or absent themes (Strauss & Corbin, 1990), themes that promoted new pedagogies, collaboration and/or difficulties faced by the teachers, and strong reactions in participants. Symbolic convergence theory (SCT) (Daniel, 2002) was used to analyze the themes that caused the greater emotional responses. SCT has been used in previous studies with teachers engaged in focus group conversations to document the development of ideas. In this study, the themes that evoke greater emotional responses are those that constitute the reality of life in the schoolhouse for the teachers (Bormann, 1983). We independently coded the survey responses and the focus group conversations prior to comparing our findings. We also examined the reflective piece that was part of the lessons the teachers prepared.

Results

Teacher comments in both the focus groups and the open-ended survey questions highlight that regardless of the funding available to a school district, the teachers either experience high-tension levels as they attempt to integrate technology into the curriculum, or face very few tensions. Furthermore, the main determinant of whether or not a teacher experienced high or low degrees of tension was the support or lack of support for the use of technology from the administrators. Noteworthy themes in this research can be divided into four categories: engagement of ELs, available technology, access to technology, and support for technology use.

Engaging ELs

Although creating movies was a new experience for all but two participants, as a group the teachers unanimously agreed that the movies they prepared helped the ELs in their classrooms to gain greater access to the curriculum. The teachers also shared that their movie-making efforts garnered approval by their students. One teacher commented, "Omar (a pseudonym) made a movie with pictures of his uncle's friends to tell the story of their salsa band and brought it to class." Teacher comments suggest they initially perceived technology would serve the learners well as a medium for introducing new language and discussing content. However, once they designed their movies and used them, they discovered that they could also use them to guide learners as they completed assignments, and as evaluation protocols. Gloria (a pseudonym), an older teacher from a group of four shared, "Now that I know how to make a movie, the next step is to ask my students to do it. And I will use it to replace the test. I will be able to evaluate what they have learned in a way that won't punish them." This foursome was an interesting group of educators because two of the teachers were mother and daughter and were employed in two different districts. It was the mother who was so amazed at the student involvement. As a reaction, the group discussed the benefits of modeling the technology for their students. It seemed that all participants saw how easily they could better connect with the technologically savvy generation.

There seemed to be an element of surprise present as the teachers made links between their observations and the Cognitive Academic Language Learning Approach (CALLA), one of the textbooks they had used in the course they had completed the prior semester (Chamot, 2009). CALLA is a reflective approach to lesson planning for teachers of ELs. It divides teacher responsibilities into five stages;

preparation, presentation, practice, self-evaluation, and expansion. Teacher comments demonstrate agreement across all participants that teacher made movies improve instruction at all stages. One group of teachers reported using the movies to " activate prior knowledge, use new vocabulary, and to explain and model." Another group used the movies "to teach students strategies and self-assessment." Yet a third group reported the movies "worked well in the anticipatory set and in expansion activities." One group of teachers excitedly shared, as one spoke over the other, and the rest nodded in agreement, "We feel that the videos helped all students, not just the ELs, better understand the information included in our unit, as well as develop ideas and insights into the altars they were making for a culmination of this unit." One teacher's statement wholeheartedly supports technology as part and parcel of all classroom instruction. This teacher stated, "After learning to make digital movies and implementing my movies into a lesson, I hope to learn how to better implement my movies in my lesson planning. The ELs love using this type of technology." The teacher seated next to her added, "This component of instruction has created great interest. They are using the language in the movie."

Available Technology

The teachers seemed accepting of whether or not they had available technologies. One district administrator shared, "There's nothing built into school budgets about how many computers a school should have." The other administrator in the group acknowledged the problems in his district when he said "There's typically a 10 year cycle for replacing computers in budgets."

None of the participants considered their expertise as needing to be nurtured or as an available technology tool. It is of interest that many of the schools represented have plenty of current technologies such as digital cameras, smart boards, and document cameras financed by grants. Although the teachers were cognizant that grants were financing the new technologies they were confident that their schools would not be adversely affected by a lack of grant monies in the future. Some of the teachers mentioned issues such as broken equipment, inadequate staff development, and low student to computer ratios. One teacher complained that in her district "there is one mobile laboratory for 1500 students."

Access to Technology

Access to technology was an ongoing repeated theme and a major problem in the majority of the schools represented. In some schools accessing the internet and downloading new programs is never a challenge while in others, there is great tension. Many of the teachers expressed their frustrations when they assign their students to do research on the internet and many sites are blocked. One teacher's statement captures the tensions in her low functioning system. She said "In my school we are required to email problems to the tech staff. How can we email if our computer breaks down? So we have to go to another classroom to email them. And then they don't come." Although on the one hand the teachers accept their limitations, technology access created an uproar in the groups.

Community Support for Technology

Teachers from high-tension systems report being held back by administrators who control access to technology. Several of the teachers mentioned "friction between colleagues who oppose technology infusion." They believe the "lack (of) time needed to develop technology expertise is an issue." In the focus group conversations there was unanimous agreement that working in groups had allowed them to collaborate because "When I didn't know the answer there was someone to help me." The teachers emphasized their need to have time to collaborate. They shared that it was the support they gave each other that kept them committed to finishing the movie-making project. One teacher group even admitted to having gone on the internet and asked questions of a 14-year-old who was technologically savvy.

Conclusions and Implications for Practice

Implications from this study are that school districts that support teachers using technology make it possible for their teachers to better address their ELs' needs. There was great enthusiasm on the part of the teachers even in the face of the frustrations they shared. It is revealing that the obstacles identified in this study do not suggest that teachers are unwilling to learn new approaches. Instead, they support collaborative curriculum development. It appears that school district personnel apply for grants and the training grant subsidies finance but often do not go beyond this to make technology part and parcel of their curriculum.

References

August, D. & Shanahan, T. (2006), *Developing literacy in second-language learners: Report of the National Literacy Panel on Language-Minority Children and Youth*. Mahwah, New Jersey: Lawrence Erlbaum Associates.

Bhabha, H. K. (1994). *The location of culture*. New York NY: Routledge.

Bormann, E. (1983). Symbolic convergence: Organizational communication and culture. In L. Putnam & M. E. Pecanowsky (Eds.). Communication and organizations: An interpretive Approach. (pp. 99-122). Beverly Hills, CA: Sage.

Camarota, S. A. (2007). *Immigrants in the United States, 2007: A profile of America's foreign born population*. Retrieved from http://www.cis.org/articles/2007/back1007.html

Chamot, A.U., (2009). *The CALLA handbook: Implementing the Cognitive Academic Language Learning Approach* (2nd ed.). White Plains, NY: Addison Wesley Longman.

Chow, P. & Cummins, J. (2003). Valuing multilingual and multicultural approaches to learning. In S. R. Shecter and J. Cummins, (Eds.), *Multilingual education in practice: Using diversity as a resource* (pp. 32-61). Portsmouth, NH: Heineman.

Cummins, J. & Swain, M. (1986). Bilingualism in education: *Aspects of theory, research and policy*. London: Longman.

Cummins, J., Brown, K., & Sayers, D. (2007). *Literacy, technology, and diversity: teaching success in changing times*. Boston, MA: Allyn & Bacon, Publishers.

Czikszentmihalyi, M. (1998). Finding flow: *The psychology of engagement with everyday life*. New York, NY: Basic Books.

Czikszentmihalyi, M. (1990). Flow: *The psychology of optimal experience*. New York, NY: Harper & Row Publishers.

Daniel, M. C., Taylor, S. K., Schwarzer, D., Garcia, O., Despagne, C., Peigne, C., & Cohen, S. (2011, July). *Mission Impossible Creating Multilingual Spaces in K-12 Classrooms*. Paper presented at BilingLatAm IV: Simposio Internacional sobre Bilingüismo y Educación Bilingüe de Latinoamérica, Oaxaca, México.

Daniel, M. (2002). Theory and practice of writing instruction in the secondary foreign language Classroom: Teachers' views vs. theory. *Dissertation Abstracts International*, (UMI No. 3064490).

Echevarria, J., Vogt, M., & Short, D.J. (2008). *Making content comprehensible for English Language Learners: The SIOP model.* 3rd Ed. Boston: Pearson & Allyn and Bacon.

Engeström, Y. (1987). *Learning by expanding: An activity theoretical approach to developmental research*. Helsinki: OrientaKonsultit.

Erben, T., Ban, R., Jin, L., & Summers, R. (2007). Using technology for foreign language instruction: Creative innovations, research, and applications. In T. Erben and I. Sarieva (Eds.). *CALLing all foreign language teachers: A looking glass adventure of integrating technology into classroom practice.* New York: Eye on Education Press.

Garcia, O. (2009). *Bilingual education in the 21st century: A global perspective*. West Sussex, UK: Wiley Blackwell.

Goldenberg, C., Y Coleman, R. (2010). *Promoting academic achievement among English learners*. Thousand Oaks, CA: Corwin Press.

González, N., Moll, L., and Amanti, C. (Eds.) (2005). *Funds of knowledge for teaching in Latino households*. Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

Gutiérrez, K., Baquedano-López, P., Alvarez, H., & Chiu (1999). Building a culture of collaboration through hybrid language practices. Theory into Practice, 38(2), 87-93.

Hunter, M. (1971). *Teach for transfer: A programmed book*. El Segundo, CA: TIP Publications. International Society for Technology Education 2008. National Educational Technology Standards. Retrieved from http://www.iste.org/standards.aspx

Kelley, J.G., Lesaux, N.K., Kieffer, M.J., & Faller, S.E. (2010). Effective academic vocabulary instruction in the urban middle school. *The Reading Teacher*, 64, 5-14.

Kindler, A. (2002). *Survey of the states' limited English proficient students and available educational programs and services: 2000-2001 summary report*. Washington, DC: US Department of Education Office of English Language Acquisition Language Enhancement.

Krashen, S. (1981a). *Second language acquisition and second language learning*, Pergamon Press: Oxford.

Krashen, S. (1982b). *Principles and practice in second language acquisition*. Pergamon Press: Oxford.

Lesaux, N.K., Kieffer, M.J., Faller, E., & Kelley, J. (2010). The effectiveness and ease of implementation of an academic vocabulary intervention for linguistically diverse students in urban middle schools. *Reading Research Quarterly*, 45, 198-230.

Norman (1982a). *Learning and memory*. San Francisco: W. H. Freeman.

Norman, D. (1993b). *Things that make us smart: Defending human attributes in the age of the machine*. New York, NY: Addison-Wesley.

Nunan, D. (1999). Communicative tasks and the language curriculum. *TESOL Quarterly*, 25(2), 279-295.

Pang, V. O. (2005). *Multicultural education: A caring-centered, reflective approach*. 2nd Ed. Boston: McGraw-Hill.

Short, D. & Fitzsimmons, S. (2007). *Double the work: Challenges and solutions to acquiring language and academic literacy for adolescent English language learners: A report to the Carnegie Corporation of New York*. Washington, DC: Alliance for Excellent Education.

Snow, M. & Brinton, D. (1988). Content based language instruction: Investigating the effectiveness of the adjunct model. *TESOL Quarterly*, 22(4).

Strauss, A., & Corbin, J. (1990). Basics of qualitative research: Grounded theory, procedures, and techniques. Newbury Park, CA: Sage Publications.

Suárez-Orozco, M., & Suárez-Orozco, C. (2009). Educating Latino immigrant students in the Twenty-First Century: Principles for the Obama administration. *Harvard Educational Review* 79(2), 327-340.

Vygotzky, L. S. (1986). *Thought and Language.* Cambridge, MA: MIT Press.

Wang, F. & Hannafin, M. (2005). Design based research and technology enhanced learning environments. *Educational Research and Development*, 53(4), 5-23.

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