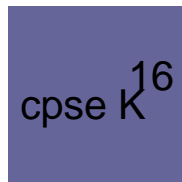


Lighting the Flame of Learning for English Language Learners Through the Use of Interactive Whiteboard Technology

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Introduction

Educators have for many years looked at computer technology as a potential source for meeting the learning needs of English Language Learners.

Throughout the 1960s and 1970s, a behaviorist model for computer-based instruction existed in which language instruction was introduced in the form of drill and practice. During the 1980s and 1990s, the focus shifted to the cognitive and language proficiency needs of ELLs in which content-based teaching became a widely accepted means of teaching English (Butler-Pascoe & Wiburg, 2003).

Today's technology-based instruction emphasizes students constructing meaning based on a high degree of interactivity among students, between students and curriculum, and between students and teacher. An emerging class of technology that offers enormous potential in generating these interactions is *interactive whiteboards* or IWBs. The purpose of this paper is to examine the potential of IWB technology in lighting the flame of learning for English Language Learners.

Background

In the United States, greater cultural and linguistic diversity and a new wave of immigration have led to demographic changes in our school-aged population. The English Language Learner (ELL) student population continues to grow more rapidly than the student population as a whole. The National Center for Educational Statistics reports that the general population grew 9% from 1993 to 2003, while the ELL population expanded by 65% in that same time period. Of the 49,619,117 total K-12 students in 2003, 10% or 5,014,437 were ELLs (NCELA, 2005).

The No Child Left Behind Act (NCLB) of 2001 includes increased accountability for states, school districts, and schools; greater choice for parents and students; more flexibility for states and local educational agencies in the use of Federal education dollars; and a stronger emphasis on reading. For ELLs the overarching goals of NCLB are to help limited English proficient and immigrant students to:

- Attain English proficiency.
- Attain high levels of academic competence in English.
- Meet state standards.

Schools accomplish these ELL goals through Title I and Title III NCLB programs. Title I outlines the state standards, assessment, annual yearly progress, and other accountability requirements for ELLs. Title III provides funding to state and local education agencies who are obligated by NCLB to increase the English proficiency and core academic content knowledge of English Language Learners. Under this title, local school districts decide on the method of instruction to be used to teach ELLs English, but requires that instructional programs to be scientifically proven to be effective.

The Challenge to Educating English Language Learners

English language learners come to U.S. schools with many resources to share in classrooms, including linguistic resources in their native language. However, students who are learning English as an additional language are not alike.

ELLs enter schools with a wide range of language proficiencies (in English and in their native language) and of subject matter knowledge. They differ in their educational backgrounds, expectations of schooling, socioeconomic status, age-of-arrival to the United States, and personal experiences coming to and living in the United States.

Among immigrant students, some ELLs have strong academic preparation. They are at or above equivalent grade levels in the school curricula and are literate in their native language. For the most part, these students need English language development so that as they become more proficient in English, they can transfer their educational knowledge to the courses they are taking. These ELLs have the greatest likelihood of having educational success, if they receive appropriate language and content instruction in their schools.

Other immigrant students arrive at U.S. schools with limited formal schooling—perhaps due to war or the isolated location of their home. They have significant gaps in their educational backgrounds, lack knowledge in specific subject areas, and often need additional time to become accustomed to school routines and expectations. These ELLs need literacy skills, English language development, and content area knowledge.

Other ELLs have been raised in the United States but speak a language other than English at home. Many of these ELLs are literate in their home language and just need to add English to their knowledge base in school. Others are not literate in any language. While most of these students learn English during their elementary school years, some nonetheless reach secondary levels having never mastered English or the home language.

For the most part, non-native English speakers do not have the same language skills and background in English as native speakers when they enter school. When native English-speaking children enroll, they have oral proficiency and a natural understanding of the grammatical system. Curricula and instruction builds from the expectation that students know some English when they start school. Language minority students rarely have that level of proficiency.

Students with limited formal schooling and below grade-level literacy are most at risk for educational failure. While most ELLs show sufficient growth in acquiring social language skills (e.g., basic reading and conversational skills geared to many out-of-school and survival interactions) in a few years, they are less successful in acquiring the academic language needed for passing the high-stakes assessment mandated by NCLB.

Strategies for Educating English Language Learners

ELLs are more likely to experience school success if educators use long-term consistent strategies across all classrooms, along with efforts to involve parents and the community. Strategies most effective are those that integrate the fundamentals of English language development with appropriate high-quality instructional strategies.

What are high-quality instructional strategies?

The National Research Council (2000) completed a synthesis of the research from the fields of cognitive, developmental and educational psychology, and brain research on how people learn. Their review identified a number of principles of effective instructional practice that have implications for ELL teachers:

1. Learning builds on previous experiences and therefore, ELL teachers need to incorporate ELLs' prior knowledge, culture, interests, and experiences in new learning.
2. Learning takes place in a social setting and therefore ELL teachers need to provide opportunities for ELL student-interactions.
3. Knowledge taught in a variety of contexts is more likely to support learning across students with diverse learning needs and therefore, ELL teachers need to integrate ELL strategies in different contexts.
4. Connected, organized and relevant information supports students learning of knowledge but also helps them develop higher-order thinking skills. Thus, ELL teachers need to contextualize instruction and use strategies such as graphic organizers that support ELLs' development of higher-order skills.
5. Feedback and active evaluation of learning furthers students' understanding and skill development. The result is that ELL teachers need to incorporate short-cycle assessments into the lesson plan that provides ELLs some measure of how they are progressing through the learning process.

The Council's review of the research does not suggest one best way to teach all ELLs, but does suggest that teachers need to have working knowledge of a variety of effective instructional strategies to flexibly support ELL student achievement. Such strategies should reflect the construction of meaning from different perspectives, the acknowledgment of context in literacy learning, the use of language for real communication, the use of relevant literacy materials, and a focus on higher-order thinking and problem solving (NCREL, 2003).

Interactive Whiteboard Technology: Lighting the Flame of Learning for English Language Learners

Educators have for many years looked at computer technology as a potential source for meeting the learning needs of ELLs.

Throughout the 1960s and 1970s, a behaviorist model for computer-based instruction existed in which language instruction was introduced in the form of drill and practice. Over the years, research shows that such isolated drill and practice was not an effective way to improve students' academic achievement. During the 1980s and 1990s, the focus shifted to the cognitive and language proficiency needs of ELLs in which content-based teaching became a widely accepted means of teaching English (Butler-Pascoe & Wiburg, 2003).

Today's technology-based instruction emphasizes students constructing meaning based on a high degree of interactivity among students, between students and curriculum, and between students and teacher. An emerging class of technology that offers enormous potential in generating these interactions is *interactive whiteboards* or IWBs. An IWB is a large, interactive whiteboard that is connected to a digital projector and a computer. The projector displays the image from the computer screen on the board. The computer can then be controlled by touching the board, with a special pen. These active classrooms can address the five instructional principles outlined earlier in a variety of ways.

Learning builds on previous experiences and therefore, ELL teachers need to incorporate ELLs' prior knowledge, culture, interests, and experiences in new learning.

Active classrooms can support many effective instructional strategies for ELLs, such as using nonlinguistic representation, helping students recognize patterns, and giving students opportunities to practice communicating complex ideas. However, teachers can also use IWBs to link ELLs' prior experience with new learning by bringing ELLs' home culture, interests, and experiences into the classroom through digital images, music, and multimedia. The result is that ELL teachers can use Active classrooms to create learning environments where ELLs can construct their own knowledge as teachers scaffold students' learning with new content knowledge.

Learning takes place in a social setting and therefore, ELL teachers need to provide opportunities for ELL student-interactions.

Active classrooms provide teachers with many opportunities to create social settings where student interactions can result in learning. For example, research has shown that opportunities for students to use an IWB to present and discuss their own work with other students, or become involved in a class-wide activities, e.g. a class activote, improves their attention and engagement in the learning process (BECTA, 2003; Burden, 2002; Miller & Glover, 2002).

Central to these student interactions are IWB features that allow students to annotate, conceal, manipulate, move and zoom in on or focus on images, including text (Bell, 2002; Levy, 2002; Thomas, 2003). For example, students in one study used IWBs to manipulate and color in visual images that resulted in better understanding of fractions and percentages, measurement of angles, and transformation of shapes (Edwards et al., 2002).

This is the reason Kennewell (2001) argues that students must be allowed to use IWBs themselves. Active classrooms in an interactive group-setting motivate students because the students' interactions within the context of IWB features make lessons more enjoyable and interesting, resulting in improved attention and behavior essential to learning (Beeland, 2002).

Knowledge taught in a variety of contexts is more likely to support learning across students with diverse learning needs and therefore, ELL teachers need to integrate ELL strategies in different contexts.

Active classroom technology-features can compensate for many differences in background that ELLs bring to the classroom and helps develop engaged learning environments that encourage students to learn. Many teachers that use IWBs in their classroom claim that such technology promotes student learning because of its multimedia and multi-sensory capacity. For example, teachers have reported that an IWB's capacity to present stimulating visual images enhances students' recall of information from being able to still "see" the images in their mind even after completing the lesson (Burden, 2002).

Project-based learning, thematic instruction, and cooperative grouping are strategies that teacher can use to engage ELLs. Such strategies give students opportunities to talk about shared learning experiences and to engage in hands-on, experiential learning experiences that promote learning of new material. Active classrooms can help ELLs in this latter process by making available multimedia, simulations, and modeling.

The active classroom's capacity to present a range of multimedia resources efficiently is also argued to help students learn. This is not only because there is more information available, there is also a wider variety of information so that ideas and concepts become more tangible and students find the concepts easier to assimilate (Levy, 2002). Moreover, teachers report that they can more easily accommodate a wider range of student learning styles using IWBs, when needed for particular students' needs (Bell, 2002; Billard, 2002).

Connected, organized and relevant information supports students learning of knowledge but also helps them develop higher-order thinking skills. Thus, ELL teachers need to contextualize instruction and use such strategies like graphic organizers that support ELLs' development of higher-order skills.

Walker-Tileston (2004) argues that children learn best through their dominant senses, seeing, hearing and touching. Active classrooms can appeal to all three senses simultaneously through a variety of visual representations, sounds and the capacity to touch and interact with the board. The challenge to educators in successfully educating ELLs is access to organized, relevant, engaging, authentic, and comprehensible yet demanding materials in the students' target language.

Active classrooms make access to learning materials more efficiently than print media because ELLs create stronger memory links to materials through multimedia presentations that combine visual, audio, and text than a single medium alone. Active classrooms also allow instant and accurate playbacks, which help ELLs to access specific segments of material much more easily. Video materials presented through IWBs can also bring natural and context-rich linguistic and cultural materials to ELLs while the Internet—accessed through an active classroom—can enable ELLs to access authentic news and literature in the target language.

ELLs' communicative interactions through an IWB can occur in either written or spoken language or a combination of both. At the simplest level, active classroom -based computer program can generate utterances either orally or in writing that require the learner to respond by selecting an answer with a radio controlled response system that allows students to interact with the IWB, or providing simple writing responses. With the advancement of speech synthesis and recognition technologies, ELLS can also carry on near natural conversations with an IWB-based computer program around pre-selected and programmed topics.

Still, another active classroom-based communication interaction can occur with remote audiences through electronic mail, bulletin-boards, and chat-rooms. Such IWB-enabled technologies bring a much needed audience to ELLs and promote more equal and better student participation that leads to more learning.

Feedback and active evaluation of learning furthers students' understanding and skill development. The result is that ELL teachers need to incorporate short-cycle assessments into the lesson plan that provides ELLs some measure of how they are progressing through the learning process.

Active classrooms can also provide ELLs with helpful feedback that can enhance students' learning. Active classroom-based programs can give ELLs instant feedback to questions or the computer can store and analyze student responses to questions for teachers to review with students to identify opportunities for re-learning that leads to student success (Miller & Glover, 2002; Richardson, 2002).

Recommendations for Educators and Technology Decision Makers

The purpose for using IWBs in the classroom is to enable access to and use of digital resources for the benefit of the whole class while preserving the role of the teacher in guiding and monitoring learning. Active classrooms support many effective strategies, such as using nonlinguistic representation, helping students recognize patterns, giving them opportunities to practice communicating complex ideas, allowing teachers to participate in ELL instructional chat rooms, and bringing their home culture into the classroom through digital images, music, and other multimedia.

Still, educators should take great care when planning for an active classroom-based classroom. One of the most frequent issues raised by both teachers and students is the need for adequate training in order to use IWBs to their full potential. Teachers' inexperience in setting up equipment and in manipulating features on the board, leading to lesson disruption is a concern for both teachers and students (Levy, 2002). Teacher buy-in into the use of IWBs in the classroom is another issue. Some researchers have highlighted that even when a teacher initially commits to use IWBs as a transformative pedagogic tool, lack of practical and methodological training can impede and frustrate such noble intentions (Burden, 2002).

Nevertheless, teachers and students consistently report high levels of enthusiasm for IWBs. Thus, technology decision makers need to ensure that such enthusiasm from teachers and students can be translated into effective and purposeful practice. IWB technology should be used in unique and creative ways above and beyond that which is possible when teaching with normal whiteboards or other projection methods. The uniqueness of IWB technology lies in the possibility for an intersection between technical and pedagogic interactivity. At this intersection lies the possibility of lighting the flame of learning for English Language Learners.

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