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Integrating technology: Best-use practices for English language learners in mainstream classrooms

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Integrating Technology: Best-Use Practices for English Language Learners in Content-based Classrooms

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Introduction

The demographic changes in K-12 classrooms in the United States have resulted in an increasingly diversified student population. With the advent and permeation of technologies, recent years have witnessed enthusiastic implementation of technologies in various educational settings, particularly in the area of language learning and teaching. The literature is replete with claims that computer technologies have great potential in assisting second language learning and teaching. Hence, advocating the use of computer technologies to help ELL students develop English language proficiency is no longer a novel idea. The outstanding issue that educators are now faced with is how to effectively integrate technology into content-based classroom pedagogy.

This chapter offers a review of technology uses appropriate for English Language Learners in content area classes. It is intended to assist content-area teachers in utilizing accessible and low-cost technologies to design and implement effective learning activities that meet the specific learning needs of English Language Learners. The following sections highlight the past and present issues concerning technology-enhanced education, and address the appropriate integration of various programs and activities that capitalize on authentic, practical and meaningful contexts, which are considered to be at the core of effective content-based language learning.

Historical Developments of CALL

Computer-assisted language learning (CALL) emerged with the advancement of computer technologies in the early 1950s when the first computer was invented. In the late 50s and early 60s, universities began to create local area networks (LAN) on their campuses. These networks allowed computers to communicate with one another and helped to hasten the transfer and exchange of information. Educators became interested in the opportunities afforded by these networks and began to expand their experimentation with them. One of the earliest of these networks was PLATO. This was a mainframe computer that allowed professors to construct and store exercises for language learning. An excellent illustration of this type of technology use was set forth by Collett (1980), when he constructed a bank of activities on his university's mainframe designed explicitly for the sole purpose of teaching students grammar -- the distinctive focus at the beginning of the integration of technology and foreign language learning activities. However, all the early exercises were simply grammar-based "drill and kill" activities. Almost a decade later, Dunkel (1987) advocated new trends in computer-aided instruction (CAI). He believed that the cost in setting up new computer networks was prohibitive to most universities, that there was a lack of good software available to teachers, and, most importantly, he had a growing belief that the teaching of languages in the historical manner was not beneficial to most students. Dunkel's (1987) thoughts on the effective use of CAI in the classroom began to shift the focus away from drill-based computer use in the classroom to a more holistic, purposeful language agenda based on the notion of communicative competence (Canale & Swain 1980). Since the late 1990s, with the advancement of computer networking, many researchers

(e.g., Chun & Plass, 2000; Kern & Warschauer, 2000) have claimed that computer networking lays a clear path for meaningful communication. They stress that computer-mediated communication (CMC) enabled by the World Wide Web is conducive to developing language learners' communicative competence in many unique ways. Evidence of the advantages of computer technologies in content-based classrooms can be found throughout the literature, and is growing more voluminous as technological and educational advancements move language learning into an era of more engaged, authentic, active learning. The following section provides a review of the empirical research studies conducted with second language learners, and reports on the implications for content-based teaching.

Research Findings: Benefits and Caveats of CALL

Since the inception of network-based language teaching and learning there have been numerous studies examining the effectiveness of computer-mediated communication (CMC). In comparing CMC and face-to-face discussion, research has demonstrated that within computer-mediated environments, language learners display lower levels of anxiety (Beauvois, 1992; Kelm, 1992), they participate more (Kelm, 1992; Kern, 1995; Sullivan & Pratt, 1996) there is more peer-to-peer interaction (Erben, 1999; Kern, 1995), and that students produce more language (Beauvois, 1992; Kelm, 1992; Kern, 1995). When learning takes place within CMC environments, language learners also generate more types of sentence structures and more discourse functions (Chun, 1994; Kern, 1995), they use more lexically and syntactically complex language and discourse strategies (Warschauer, 1996), they develop a greater cultural awareness (Jin, 2004; Warschauer, 1997), there is more equalized participation among students (Kelm, 1992; Sullivan & Pratt, 1996; Warschauer, 1996), students have a greater sense of errors (Salaberry, 1996), as well as develop increasingly target-like writing styles (Davis & Thiede, 2000).

Within the interactivist perspective of language learning, researchers have identified a plethora of benefits of CMC, with the promotion of interaction being at the crux of this type of second language learning and acquisition (Pica, 1994; Larsen-Freeman & Long, 1991). Kern and Warschauer (2000) purport that computer-mediated communication provides an ideal medium for students to benefit from interaction. The advantages include access to comprehensible input (Ortega, 1997; Warschauer & Healey, 1998), opportunities for learners to produce output (Blake, 2000; Erben, 1999; Ortega, 1997; Warshauer & Healey, 1998), and opportunities to negotiate meaning (Blake, 2000; Lee, 2002; Pelletieri, 2000). A more recent line of CMC research (Blake, 2000; Lee, 2002; Pelletieri, 2000; Sotillo, 2000) focuses on the corrective feedback in online environments. Results revealed that teachers focus on content rather than grammar and students tend to self-correct their errors. Additionally, interactions where students focus on form and receive corrective feedback tend to be effective in promoting second language acquisition.

In addition to computer-mediated communication, which supports primarily text-based information exchange, are hypertexts, which use the World Wide Web to deliver language learning materials. This has attracted a great deal of attention from language learning researchers and practitioners (Blyth, 1998; Peterson, 1997). A multitude of web sites for language teaching and learning are available and used in addition to text for more graphically presenting information in the forms of visuals and audio. This relatively new and large body of research on networked multimedia environments for language learning suggests that multimedia information

and the way it is presented may aid in the comprehension of content by supporting the various cognitive processes involved in comprehension with the surrounding and concomitant materials (Chun & Plass, 1996, 1997).

Yet, computer-assisted language learning is not without its problems. Researchers (e.g., Peterson, 1997; Singhal, 1998) found several limitations of computer applications in language learning, and synthesized these disadvantages into four main areas: 1) technical difficulties; 2) logistic constraints; 3) cognitive demands; and 4) affective stress. For instance, an Internet connection might be slow and unreliable, thereby creating difficulty in logging on, especially if many users are online at the same time, which might cause frustration on the part of students (Peterson, 1997; Singhal, 1998). Other considerations include the sometimes daunting cost of network technology, and the possibility that the students might feel dislocated and frustrated when there is too much information on the board (Moran, 1991). Additionally, the lack of physical cues or lack of information on how to respond appropriately in synchronous discussions might cause contextual deprivation or technology stress (Peterson, 1997). Without moderation or facilitation of some kind, computer-mediated communication could be meaningless for learning. For example, learners might use their L1 to talk about off-task topics, or the anonymity enabled in online chats might lead to flaming or irresponsibility for published content (Janangelo, 1991; Kern, 1995). Finally, computer-assisted collaboration, especially in asynchronous communication, might end up in "aloneness" due to the lack of direct feedback (Philips, 1983). As for globally linked hypertext (the Internet), Chun and Plass (2000) assert that language learners might suffer cognitive overload, which may be caused by poorly designed navigation or by the structure of hypermedia itself, which supports multilinear, rather than sequentially or spatially arranged texts. Reeves (1992) also warns that authentic materials accessible online might cause incomprehensive input, which does not benefit language learning.

Research in computer-assisted second language learning illustrates a multi-faceted picture in terms of the effectiveness of networked technologies in various aspects of language learning. However, the current debate is no longer whether technologies should be applied to language learning and teaching, but how to reach the full potential of computer technologies while minimizing the disadvantages inherent in them. Helping ELL students achieve both linguistic and academic goals constitutes a special context where the potential of technologies can be maximally reached.

Impacts of Technology on Classroom Practices

Differentiated Instruction for ELLs in Content Classrooms

Often, ELL students encounter difficulties in mastering English due to a variety of cognitive and linguistic issues (Bray, Brown, & Green, 2004). It is possible that ELL students' linguistic struggles may intervene with the academic or cognitive challenges in the classroom, and cause greater barriers to their learning of content. In an effort to address these challenges, content teachers can use differentiated instruction, a teaching approach that makes use of various instructional strategies to make ELLs' learning more successful and the teaching they receive more understandable. In differentiated instruction, learners are classified on a continuum according to their ability to meet curriculum objectives. For instance, lower-level learners might not be able to meet all objectives, but need a chance to achieve appropriate objectives at their respective instructional levels. Average learners may be able to achieve curriculum objectives,

but may need structure or content adaptation. For example, an intermediate-level ELL student may need dictionaries or other resources to facilitate his or her reading comprehension. Higher-level learners might be capable of working beyond the curriculum objectives in a much more complex and deeper fashion than other students. Adaptations for this class of learners could require the expansion of their critical analyzing skills, or an allowance for completing lessons at a faster pace or the opportunity for independent study projects. It is through differentiated learning that the curriculum can be aligned to individual student capabilities, the expected learning outcome and the content learning needs of the class. In order to plan successful differentiated instruction, teachers should consider these four steps, a) know the ELL students in terms of their respective ability levels, interests, educational backgrounds, social and cultural expectations, b) have a repertoire of teaching strategies (direct teaching, cooperative learning, inquiry-based learning, and information processing), c) identify a variety of learning activities that fit with ELLs' profiles, and d) identify ways to assess or evaluate ELLs' progress. Not to be confused with individualized instruction, differentiated instruction is a teaching approach that presents the same task in different ways and at different levels so that all learners can approach it in their own ways.

The implementation of differentiated instruction in content-based classrooms can be remarkably facilitated by technologies, and there is a variety of computer technologies available to assist teachers in adapting structure or content to fit ELL students' current comprehension levels. For example, while reading an online article in a language arts class, higher-level ELL students might use English electronic dictionaries to facilitate their comprehension, while lower-level students may use online translation tools or picture dictionaries to understand and learn the English text. The technology in differentiated instruction offers teachers some new ways to overcome certain cultural barriers to classroom activities. For instance, ELLs who are not comfortable or familiar with group work could be assigned a webquest activity in which the learner discovers and explores information alone, while other ELLs who are experienced with group work can be paired or work in small groups on a variety of cooperative tasks or projects. By infusing technology into lessons and activities, content teachers have additional ways to monitor individual ELL students' potential difficulties and progress, and thus are able to fulfill the diverse ELL needs, For example, when preparing to deliver a science lecture, teachers can post both PowerPoint slides and streaming audio to accompany them online. This allows the learner to access the content before hearing it in the classroom. The ELL can also identify and investigate new vocabulary before the class session.

Cooperative Learning in Content Classroom

Cooperative learning is an instructional strategy that allows small interactive groups of students to collaboratively work on meaningful tasks. When undertaking cooperative learning activities, students must rely on each other and assist each other in accomplishing certain tasks or reaching a common goal. Cooperative learning has been said to help motivate students and promote this active interaction, through which students are able to construct their own knowledge, and further develop necessary social and interactive skills. For example, collaboration between a higher-lever student and lower-level student might allow scaffolding to take place (Vygotsky, 1978). That is, the interaction or collaboration that occurs helps to mediate the development of the novice learner's language skills to an extent that would not have been possible without expert help (Donato, 1989). Subsequently, while helping the novice learner, the higher-level student's

knowledge and skills also are further developed. A collaborative environment engendered by cooperative learning also helps to alleviate the isolation and frustration that ELL students sometimes experience and creates an environment that allows them to assume a valid role within the classroom culture without denying their own personal culture. Much of the research on the effectiveness of ELL education suggests that collaborative, discovery-oriented learning that uses meaningful, cognitively engaging, and interdisciplinary content that builds upon the language-culture-knowledge base that students bring to the classroom, leads to ELL students' overall cognitive and language growth (Chamot, Dale, O'Malley, & Spanos, 1992; Thomas & Collier, 1997).

To that end, many researchers (e.g. Chun & Plass, 2000; Kern & Warschauer, 2000) have discovered that networking technologies provide an ideal medium for communication, and can be well-used in content classrooms to undertake cooperative learning activities. A few examples include an ELL student group investigation project using Instant Messenger (IM) as the means of communication between all group members, cooperative jigsaw activities that use chat rooms or email exchanges, or perhaps pairs or small groups that collaborate by sharing one computer to participate in online discussions or electronic publishing.

Student-centered Learning

Central to student-centered learning is equity in education, the theory that states that all students must be afforded a fair and equal opportunity to participate. To that end, technology-enriched lessons in a content-based classroom allow subject material to be presented at individual and appropriate levels, thus permitting ELL students to participate on an equal footing with other students. Even with the wide-ranging individual differences represented by ELL students in one classroom, technology is a viable option for addressing students' individual needs, while designing activities that promote language learning strategies as well as subject matter learning. However, the use of technology to promote student-centered learning is bilateral. First, the knowledge, skills and experiences the ELL brings to the learning environment must be considered in order to facilitate this process. For example, teachers may wish to survey students to become better acquainted with them and understand the linguistic and cultural diversity that exists in a particular content classroom. Second, learning activities should be designed so that they meet the academic, social and cultural needs of the specific ELL students. As an example in a social studies class, ELLs and mainstream students might discover and exchange information on diverse cultures and countries around the world by cooperatively navigating through various online environments and collaborating on a final product to be electronically published. This publication could take the form of a class website that highlights basic demographic information about the class members, their origins, and how they come together to form a new and unique community or culture. Students could be grouped or work individually to design and publish their contribution. In this type of electronic activity, ELL students can operate on an appropriate learning level within the content area as well as scaffold their language learning by utilizing external links to find definitions and further explanation of terms, illustrations or examples of text. Therefore, it can be said that effectively designed activities facilitate the integration of content and language learning while allowing the ELL student to participate as an equal member of the academic community.

It is by working independently, using technology, that students are able to reflect on their decision-making regarding language use as well as the accuracy of content knowledge. For example, while the learner composes an email or elaborates a posting on the discussion board, there is time to consider both the meaning and the form of the language. As a result of reflecting on this process while using technology, the learner is able to more appropriately apply learning strategies (Ulitsky, 2000). As students develop this ability to reflect on how they actually learn, they are able to expand and improve their learning capabilities (Oxford, 2000). Therefore, the systematic nature of the particular technology used in the classroom affords the learner the opportunity to reflect and grow both intellectually and metacognitively.

Learner Autonomy and Motivation

Learner autonomy is encouraged by allowing students to work independently, thereby engaging their full potential (Egbert & Hanson-Smith, 1999). Technology enhanced settings such as discussion boards offer a protected teacher-structured environment where each student can stretch his or her potential and learn to take risks in a non-judgmental context (Padrón and Waxman, 1996) Within these disciplined environments, students are able to take the necessary risks in their learning and feel supported, thus resulting in successful learning (Egbert, 2001). For example, the learner can take control of his or her language by referring to a dictionary or re-writing the message until he or she deems it satisfactory for posting. In addition, active learning, which puts the responsibility of organizing what is to be learned in the hands of the learners themselves, and ideally lends itself to a more diverse range of learning styles, is essential for language minority students' linguistic and academic success in all content subjects, and can be implemented in a multitude of ways in technology-enhanced content classrooms. An excellent example of autonomous, active learning can be found in the International Tandem Network. Through this extensive email network, language learners connect with native speakers of the target language to build pen-pal relationships that not only foster autonomous learning, but also cultivate literacy skills and cross-cultural understanding. To learn more about this exciting program, go to: http://www.aston.ac.uk/lss/school/tandem.jsp.

Today's students live in a world bombarded by multimedia messages that can facilitate their maneuvering through everyday life. Most students are naturally attracted to, and motivated by, activities that involve technology, especially in educational arenas. However, technology in and of itself does not promote active learning, nor does technology use that is structured to mirror the teacher-fronted approach to language teaching/learning. Learners feel motivated when up-to-date and authentic materials are used to support learning (Dlaska, 2002), and when they have teachers who incorporate some aspects of technology in an effort to scaffold their learning through the use of contextual cues such as images, icons, and audio and video elements (Chatel, 2002). For example, multimedia presentations delivered through the World Wide Web and various online simulation programs provide easy-to-use and low-cost authentic information for the students to explore and experience from an individual perspective.

Active and autonomous exercises that use technology allow students to expand and enhance their own electronic literacy capabilities. In traditional mainstream settings, ELLs frequently struggle to acquire the academic language they need to become successful in school. However, while engaged in technology-based activities, such as webquests and discussion boards, students are presented with academic language in various contexts, which not only exposes learners to

meaningful language, but also gives learners the opportunity to practice critical thinking skills that can be applied to reading in content areas (Meskill and Mossop, 2000).

Challenges of Technology Use in Content Classrooms

The use of technologies in the classroom can increase motivation, decrease anxiety, lead to more student-centered activities, provide students with an authentic audience for which to write, and in terms of language learning, can promote greater language production along with a higher level of language sophistication. However, even with all these benefits, the integration of technology into a content classroom can present some challenges and possible pitfalls of which teachers should be aware.

At the most basic level are the "technical difficulties". These events could be as simple as a burnt out bulb or finding that the computer projector and cable to the laptop are not compatible components. More problematic situations might include broken links to desired websites or finding a server that is temporarily down. Teachers will find it helpful to have a back-up plan for these sorts of prospective problems.

Also, teachers should be familiar with the limitations of the various technologies they are using. For instance, since the nature of email is asynchronous, an immediate answer or response is not expected. However, with an instant messaging program, if messages are not received and answered instantaneously, there may be a problem somewhere in the network. Other considerations might include the quality of the specific software. For example, the free software available on the Internet that is designed to hold virtual meetings (video conferences) often appears online as jumpy and pixilated video. However, it has been evidenced that students may be more receptive to seeing someone's face while talking to them than just hearing their voice, no matter the clarity of the picture.

In keeping with students' needs, especially ELL students, training in the use of these technologies should be given before they are expected to carryout an assignment using them. Not only should students be trained on the use of a new program, but also should be advised of any customs surrounding its use. For instance, when initiating a discussion board in class, the first step is to have students introduce themselves and respond to at least one posting by one of their peers. This procedure should first be explained, and then modeled to the class. If this type of training is not provided, students may experience stress that distances them from the technologies being used as well as the content area subject matter. However, when used properly, the benefits seem to far out weigh the risks.

Software, Programs and Activities for ELLs in Content Classrooms

In an effort to assist those teachers who may wish to integrate some aspect of technology into their classes, this section equips the practioner with the necessary pedagogical principles for using technology in content area classes, and provides sample activities that can be executed immediately or used as practical guides with which to create their own lessons.

Instant Messenger

Instant Messenger (IM) is a type of messaging software, which provides instant and synchronous connection to people who are on the user's contacts list. Instant Messenger supports file sharing,

and communication in the form of audio (by using microphones and speakers), and video (through digital photos and webcams), and offers extra graphic features, such as background stationary, emoticons and font manipulation. Instant Messenger allows one-to-one, or group-to-group communication, and is serviceable at either low or high internet speeds. A dial-up connection is sufficient for basic instant messaging, although transferring large files or high-resolution photos might require a higher internet speed.. Upon signing in, Instant Messenger informs the user of the availability of each person in the user's "contacts" list through status labels such as *away, busy, be right back, on the phone,* or *out to lunch*. For example, if a student is not willing to talk to anybody, he or she can set their status to any of the choices mentioned above, and this will appear on the screen of the fellow users. Three Instant Messenger programs that are widely used by Internet users include AOL Instant Messenger, Yahoo! Instant Messenger, and MSN Instant Messenger. While different IM programs may support specific and distinct communication features and actions, the major elements of Instant Messenger systems remain fairly consistent and are shown in Figure 1. Likewise, the major actions allowed are similar across different IM systems, and are displayed in Figure 2.

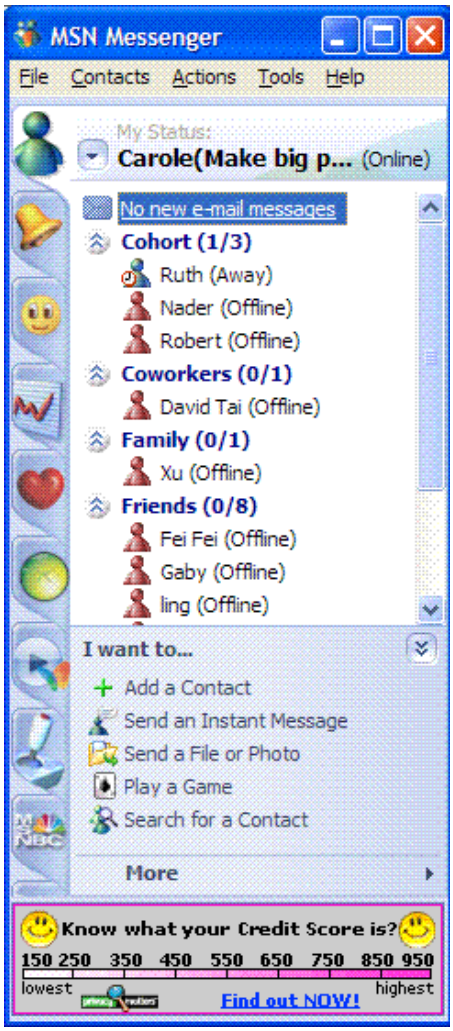

Figure 1

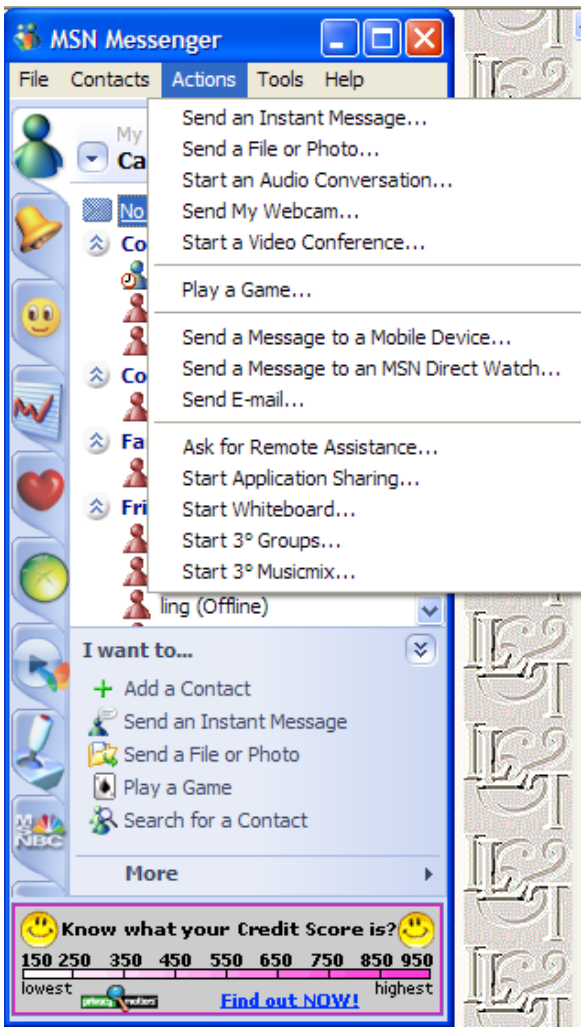

Figure 2

The Instant Messenger software can be downloaded free of charge from the website of the specific IM program. AOL IM can be downloaded at www.aim.com, Yahoo! IM can be found at http://messenger.yahoo.com/, and MSN IM at http://webmessenger.msn.com/. Each IM program provides multiple versions of IM that are compatible with different platforms, and each version may support distinct features.

The educational potential of Instant Messenger is vast, particularly for language learners, in that IM interaction is seen as a hybrid form of discourse, blending both oral and written language features. This style of discourse, which calls for the engagement of the learner's cognitive and linguistic skills is thought to improve language learners' oral and written language development as well as facilitate overall second language acquisition. Instant Messaging can be used to generate and foster interaction between ELL students and the teacher, ELL students and among other ELL students, and ELL students and mainstream students. This multi-faceted, real-time communication tool aids in connecting ELL students with teachers and other students, and enables content teachers to pay attention to individual ELL students' development. However, with the varied levels of proficiency in ELL students, IM is best used for intermediate students due to its nature of rapid, synchronous communication. A teacher must remember that not all students possess the technology skills needed to successfully operate Instant Messsenger. There are many ways that IM interactions can be used in a content-area classroom, such as having the students work collaboratively on group projects or brainstorm ideas with other group members. More detailed activities that employ the IM technology in differentiated instruction settings are presented at the end of this section.

Email

Email is a widely used asynchronous communication tool. It enables users to receive, save, and send messages to people who have an email account. Contrary to real-time interaction, the nature of asynchronous communication allows time-delayed responses. Consequently, users are free to reflect and revise messages to be sent. Email can be used in a variety of language teaching and learning contexts. Email supports communication that includes all students, and between students and the teacher, as well as between students and the native speakers in the target culture. Since email writing is essentially written discourse, students can develop writing skills through composing and exchanging email with people nearby or at a distance. Email retains and stores previous messages that can be corrected and commented upon, which in turn, enable language learners to review the corrections, reflect on writing strategies, and easily reproduce words and expressions when replying. In addition, learning through communication via email emphasizes autonomous learning, that is, students have an opportunity to reflect on language use and make use of resources such as grammar books or dictionaries. The use of email is especially beneficial to ELL students in a content classroom as a means to simultaneously develop language proficiency and academic knowledge.

Discussion boards

Discussion boards in educational use are commonly part of a course management system such as Blackboard, WebCt or NICENET. One function of these systems is a forum where teachers and students can discuss topics related to content areas. NICENET is advantageous for teachers who

work in a school where course management tools are not available. Because NICENET is a free, web-based courseware system, it provides both link sharing and a discussion board for teachers who register for the service.

Discussion board assignments can be executed cooperatively or individually by students. In differentiated instruction, a valuable arrangement might be to create heterogenous pairs of students (novice-expert) who can capitalize on the immediate verbal interaction to further develop language skills and carry out a task on the discussion board. As a result of participating in electronic classroom discussions, ELLs are able to acquire specific academic terms through the peer collaboration (Egbert & Simich-Dudgeon, 2001), and critical thinking skills can be encouraged by placing ELLs in a meaningful social context (Ovando, Collier, Combs, 2003). Other metacognitive language learning skills can be practiced through discussion board functions. For instance, students can type their answers and need not post until they have read their contribution and edited it, therefore correcting their own errors. Teachers can also provide students with a printed copy of their participation and elicit individual reflection on their language learning.

The nature of discussion boards allows practice of real-life tasks that require reading and application of written instructions. In the navigation through both the course management system and the internet, students must be able to read and follow instructions, just as the demands of daily life dictate.

Internet

Whether it is called the Internet, the World Wide Web, or Cyberspace, the most important advantage of using this technological tool in the education of ELL students, is the great wealth of culturally authentic documents it makes available to teachers and learners. This huge collection of multimedia products lends itself well to differentiated instruction, especially in content-based classrooms.

There are two main ways that Internet websites can be used with ELL students in a content classroom -- webquests and web page publication. In general, a webquest is an inquiry-based learning task in which students are given a scenario and a set of parameters and are expected to complete a task using a list of websites as resources. The instructional goal of a general webquest is knowledge acquisition and integration. For ELL students, the instructional goal is subject-matter acquisition coupled with language development. This can be achieved through effectively designed activities that include the following five components. All webquests begin with an introduction, which sets the stage and presents the ultimate question to the learner. The second piece identifies the task and describes the eventual outcome, whereas the third component outlines the specific steps the student must initiate in order to complete the activity, and provides links to online resources that may be beneficial to processing the information. The evaluation stage clearly explains how the learner is assessed, and the final stage or conclusion summarizes the student's accomplishments and encourages extension activities. To learn more about critical attributes and advantages of webquest design and implementation, particularly in content-area classes with English language learners, teachers are encouraged to visit pertinent websites. Some useful information can be found at the following locations. For a comprehensive overview, go to

http://webquest.sdsu.edu/webquest.html, or visit Discovery School's Guide for Educators at http://school.discovery.com/schrockguide/webquest/webquest.html. Many sources of information about webquests for language learning can be found through a Google search, or onsite at http://www.ardecol.ac-grenoble.fr/english/tice/enwebquest2.htm.

Web pages are multimedia documents that are published to the Internet. They can include text, graphics, animation, audio and video. Most often,they are hyper-linked to other pages in order to provide the reader with additional information. However, it is important to note that anyone can publish a page to the Internet. There is no governing body that regulates what material is acceptable, reliable, or even truthful. Therefore it is important that every web page that a teacher wants to use in class be critically analyzed in terms of accuracy and appropriateness. .

When students create their own web page they are more likely to edit and revise their writing because they realize that they are creating work for an authentic audience. They are learning to function within a new literacy framework, and within this framework, students gain technological knowledge of how to write in a multimedia environment. They learn how to best incorporate images, sounds and video into their writing, and this knowledge can lead to social empowerment, in much the same way that traditional literacy did 50 years ago. Yet, this type of technological undertaking might require some teacher-training prior to implementing it in class. If so, there are a number of resources that directly address writing for the web, and creating student web pages or sites. Many user-friendly books are available through www.amazon.com, and a Google search will reveal hundreds of helpful sources -- everything from "Web Pages That Suck" to "Creating Killer Web Sites".

Conclusion

Technology has brought dramatic changes to the lives of many people, and students and teachers are no exception. The future of technology in education is quite promising. In fact, because of networked technologies, language teaching and learning, more specifically, second language learning, is experiencing a new era of innovation. Many educators and researchers agree that it would be a waste of valuable resources if pedagogy does not take advantage of the technologies available. The dynamism of technology has already changed more than the face of education and this chapter is intended to offer a glimpse of the existing and possible roles that technology might play in content classrooms with ELL students. This integration of technology into language learning may just be the tip of the iceberg, as this evolution has, by most accounts, only just begun. The educational tool set that technology provides can enable language teachers and learners to quickly reach new goals, never before thought possible. The ultimate maturity of computer technology, could make second language teaching more effective and spontaneous. Currently, many existing technologies such as mobile phones and iPods are being explored for educational potential. Wireless/portable learning is gaining increasing attention in K-12 education, even for ELL students, and artificial intellegence might serve multiple purposes in language education.. However, content teachers should not be passive utilizers of technology, they must be active participants, continuing the critical interaction necessary to language learning. Teachers need to take more active roles in exploring how to utilize available

technologies to provide optimal help to ELL learners. The efforts from educators as well as the power of technology will guarantee a brighter future for ELL students in their academic life.

Sample Activities

Perhaps the most serviceable way to describe how to implement technology activities that can create differential learning with ELL students is through various example activities below.

Example 1: Using Email

Project	Create a science dictionary
Activity name	Learning scientific terms
Grade:	Middle School or above
Content area(s):	Science (any area)
Objective	Students will learn vocabulary for the unit
	Steps
Procedure	1, Teacher identifies vocabulary for present unit or chapter. Students add any other vocabulary they feel is necessary. 2, Students use email to work in pairs or small groups to create an illustrated unit glossary. Through email, they share files and revisions until the definitions are as they want them. 3. Students use the Internet to find illustrations or images to support the definitions. These are integrated into the text. 4. The glossaries may be published on the class website, if there is one available.
	ELL students: 1. Pairs should be created so that ELLs work with a native speaking partner or more expert language partner. 2. Students should be reminded to use their online dictionaries to translate if necessary.
Comments	1. In this activity, each ELL student collaborates with a peer, which makes them feel part of the classroom culture. 2. One-to-one communication helps ELL students make friends in class. 3. They communicate with their peer (having lower anxiety levels than in face-to-face communication) and learn how to generate ideas for writing in English. ; 4. However, ELL students may not have access to a computer or Internet connection at home. In this case, the teacher should arrange for all communication activities to take place in the classroom. 5. Teachers may need to supervise and facilitate ELL students' language use. Students may experience language difficulties which may cause communication breakdown or frustration. Dictionaries or L1 should be allowed to support communication.

Example 2: Using Internet and PowerPoint

Project	Understanding culture
Activity name:	Why we celebrate.
Grade:	Middle school or above
Content area(s):	Social Studies
Objective	Students will learn about celebrations in different cultures.
	Steps 1. Make a list of countries of origin of students in your class. Include countries of origin from previous generations. If there are not enough countries of origin, allow students to choose a country they are interested in. 2. Create groups and assign each group a country that is not their home country. 3. Tell students to use Internet to research the holiday practices from the country they were assigned. Tell them to ask their classmates about holiday practices in their countries. 4. When they have gathered information that answers the above question, tell them to create a powerpoint about the countries' celebrations. Remind students that they should use images and music to make their powerpoints more attractive. 5. If possible, post the powerpoint presentations either to a webpage or discussion board.
	ELL students: 1. Form groups that speak the same language. Assign ELL students a country that speaks the same language as they do, but is not their home country. Allow them to search the web in their home language. 2. Have students create a powerpoint; remind them to use images and translate the vocabulary into English.

Example 3: Using Discussion Board / Email

Project	Develop higher level thinking
Activity name	Synthesizing
Grade	Middle school and above
Content area(s):	Language Arts
Objective	Students develop English language reading and writing proficiency.
	Steps
Procedure	1. Teacher chooses a story that has several paragraphs. The story is divided into paragraphs. 2. Work groups are formed; each group receives a different paragraph. 3. Each group must summarize their paragraph in 1-2 sentences. Each group posts their summary on the discussion board. For the moment, the order of the summaries does not matter. 4. Students read all of the postings to understand the complete story. Working in their original groups, students recreate the story in a summary.

	5. The teacher offers corrections and comments on the students' summaries in an email to the group. Any revisions are carried out and the final product is posted by each group. 6. The teacher posts the original story and encourages students to compare their summaries to the original story.
	ELLs 1. Depending on the number of ELL students, groups are formed with only ELLs. 2. Each ELL group receives a paragraph, but the language has been modified to accommodate the students' language ability. 3. As above, students summarize and post their summaries on the discussion board. 4. Students read all of the postings. Working in their groups, they re-create the story. Remind them to use a dictionary if necessary. 4. ELLs group receives corrections on their work and re-posts. 5. Students read teacher's posting of original story. Students receive an email with story in modified language. Students compare their work to the original story.
Comments	1. In this activity, students have access to authentic information which is tailored to their own level, and can incorporate the teacher's correction into their writing. 2. They receive prompt feedback from the teacher. 3. The multiple drafts and feedback between drafts help ELL students develop writing skills gradually with lower anxiety.

Example 4: Using Instant Messenger / Discussion board

Project	Create a book report
Activity name:	Book club
Grade:	Third and above
Content area(s):	Language Arts
Objectives:	• Students will be motivated to read literature • Students will be able to better understand literature through discussion
Materials:	Reading material (books, stories, poems, etc) Groups of pairs that read the same work need to be able to work in small groups.
	Steps
Procedure	1. Students are either assigned or choose a book or story to read and discuss. A time limit is set for completion of reading. 2. Novice/expert language groups are formed to read and then use IM to discuss the readings. 2. Each group posts their report about what they have read on the class discussion board. 3. Student groups read each groups' posting and poses at least one probing question about the work they read. Groups use IM to formulate the question they want to post.

	4. Reporting group responds to questions about their readings.
Comments	1. This activity is an alternate way to allow ELLs to discuss literature in the Language Arts classroom. 2. Another alternative to this activity is to allow ELLs to work in pairs then post their summaries.

Example 5: Using Discussion Board / Internet / Streaming Audio / Instant Messenger

Project	Developing critical understanding
Activity name:	Understanding current events
Grade:	High school
Content area(s):	Social science, science, language arts – depends on the focus of the news story
Objectives:	• Students will be able to read and understand local newspapers • Students will be able to offer an opinion regarding a selected topic.
Materials:	URL to local newspaper or similarly to radio station (CNN news) One selected news story
	Steps
Procedure	1. Post link to local newspaper story or post an audiofile of a radio news report. 2. Post one critical discussion question according to grade level. 3. Elicit student response to discussion question. 4. Have students respond to peer opinions. 5. Invite mainstream students to read or listen to news in another language. Elicit reflections on working in another language from group.
	ELLs 1. Offer news report in languages of ELLs through links to newspapers or radio files in other languages. 2. Allow students to use IM to discuss their responses to the critical question before posting.
Comments	1. This activity offers ELLs the opportunity to share their opinions regarding current events. 2. Remind students to maintain appropriate respect in discussing potentially controversial topics. 3. Anticipate any cultural misunderstandings or possible offense around certain topics.

Example 6: Using Discussion Board

Project	Making history real
Activity name:	My story
Grade:	Fifth grade and higher
Content area(s):	History
Objectives:	• Students will be able to reflect on personal histories. • Students will be able to situate their family history within national or international history.

Materials:	Discussion board Information about family history
	Steps
Procedure	1. Identity a period or event in recent history. Have students interview family members about their memories of this event. 2. Have students post a paragraph explaining what they found out from their family. 3. Have students read each others' work. 4. Ask students to post observations, questions or opinions about similarities or differences between different families and their experiences. 5. Have students continue discussion by responding to each others' questions. .
	ELLs 1. Tell students to ask family members about the same time period in their home country. 2. Invite students to email their postings to you (the teacher) for revision before posting them on the discussion board. Return the edited work via email. Have students make changes and post. 3. Encourage participation in class discussion.
Comments	1. This activity allows learners the opportunity to situate their family's experiences in the local, national or international arena, and raises awareness about how different cultures or people can see the same event differently. 2. Remember that although technology offers a safe setting for participation, students may be hesitant to share very personal details.

Example 7: Using Webquest

Project	Animals in different environments
Activity name:	Monarchs in Winter
Grade:	Middle grades 4-6
Content area(s):	Science, Language Arts
Objective	Students will identify each stage in the life cycle of a monarch butterfly. Students will discover why monarchs migrate to Mexico for the winter. Students will compose a summary of their findings.
	Steps
Procedure	1. Create a webquest using the instructions found in this activity. 2. Tell students to look at this URL. Have them draw a picture of the monarch butterfly. Have them answer this question: How is the monarch protected from predators? http://www.enchantedlearning.com/subjects/butterfly/species/Monarch.shtml 2. Have students use both the previous and this URL to answer these questions: What are the life cycles of a Monarch butterfly? http://www.ivyhall.district96.k12.il.us/4th/kkhp/1insects/monarch.html

	3. Have students use the URLs to answer this question: Why do Monarchs migrate south for the winter? http://www.mbsf.org/facts.html, http://www.mexconnect.com/mex_/travel/bzm/bzmbutterflies.html 4. Have student use this URL to tell the story of a group of students that visited the Monarch butterfly sanctuary in Mexico. http://www.smm.org/sln/monarchs/story/story.html 5. Have class work together to create a powerpoint presentation on the life cycle of the Monarch. Form groups, and assign one phase to each group after they have finished the webquest.
	ELLs 1. Have Spanish speaking students use this URL to answer this question: [we need an upside down question mark here] Cual es la información sobre la mariposa monarca mas importante para tus companeros de clase? http://www.ccu.umich.mx/mich/monarca/mon-inicio.html 2. If possible have students use the same URL to create a powerpoint presentation in Spanish about the place where the Monarchs migrate to in Mexico.
Comments	The teacher should circulate through the class and model strategies for dealing with unknown words or concepts, such at looking at words in different contexts, and using online dictionaries.

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