

Teacher Training Involving Technology:
The New Challenges of
Multimedia-Based Content,
Technology-Enhanced Language Learning,
and Computer-Mediated Communication

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ABSTRACT

The rapid changes in language learning involving technology of the last decade are having a great impact upon efforts at supporting up-to-date teacher training for language instruction. Due to tremendous advances in Multimedia-Based Content (MBC), Technology-Enhanced Language Learning (TELL) and Computer-Mediated Communication (CMC) technologies, especially those involving the World Wide Web (WWW), learners of foreign and second languages are pursuing self-paced, interactive study in the context of formal instruction. This paper presents background information, outlines important developments, discusses problematic issues in language learning technology as they have an impact on teacher training, and offers suggestions for specific innovations in pedagogical courses and general recommendations for faculty guiding students embarking on the path to language teaching in the next millennium.

THE STATE OF CURRENT RESEARCH

Owing to the extremely rapid, widespread deployment of computer technology in such a relatively short time, there have been few publications to date which discuss the changes necessary in teacher training programs due to this remarkable transformation. The references presented in this paper do show that the current research on technology in language pedagogy is enlivened by the creativity of individual practitioners, who then reflect upon their use of MBC, TELL and CMC. This paper builds on the two most recent and valuable contributions by Kassen & Higgins (1997) and Scott (1998), the ideas of which will be discussed in the section on teacher training involving technology.

The Perspective of a Practitioner

Drawing on the most recent scholarship available, as well as experience acquired from instruction with MBC in undergraduate German language and culture courses and extensive exploration of these issues in the author's undergraduate seminar on Multimedia and Second Language Acquisition, the paper presents viewpoints formulated as practitioner, which must await the judgement of long term research efforts and the experience of other practitioners. The suggestions and ideas offered here are the synthesis of practice and reflection, which itself is a key component to training teachers to effectively use technology. Reflection on practices improves them (Kassen & Higgins, 1997).

The Role of the Teacher

The following assertion in an important article by Kramsch & Andersen puts the challenge of MBC in perspective:

What multimedia thrusts upon us as never before is the necessity to keep text and context in constant tension with one another. The computer with its unlimited capacity, rather than challenging our analytic and interpretive responsibilities, seduces us into believing that the truth is just around the corner of the next "text" that will fill the ultimate gap in our understanding. But this universe of spoken, visual, written, and printed texts is not self-explanatory. As a medium, it can only substitute itself for the living context and foster the illusion that con-text is nothing but an assembly of texts that get illuminated in unmediated fashion by juxtaposing them with other texts. Contrary to folk wisdom, understanding has not been made more immediate through the advent of multimedia technology. Rather, it has become more mediated than ever, with a mediation that ever more diffuses and conceals its authority. The role of education, and foreign language education in particular, is precisely to make this mediation process visible. (Kramsch & Andersen, 1999, p. 39)

The very important process of mediation means that the role of the teacher in instruction is not endangered by the rapid deployment of MBC, but rather, that the need for the teacher to effectively mediate learning materials is even greater with MBC.

Today's Language Learners

Language learners of today – both in the environment of traditional instruction and by independent efforts – are increasingly computer literate. Two labels accurately fit this audience: they are visually literate and entertainment-oriented. This generation is capable of working well with MBC and in a TELL environment, but also demands much of the materials, in terms of graphic user interface (GUI), help functions and navigational ease, and of the instructor mediating them (Gölz, 1999). Although CALL materials have existed since the 1960's (Levy, 1997), the tremendous leap to multimedia and internet-based

resources is having a greater impact. An expanding amount of interactive materials on the WWW, MBC on CD-ROM or DVD, and exciting CMC options, such as archived discussion boards, chatrooms and email, are all transforming the ability to learn a foreign or second language effectively (Bush, 1997). Because today's language learners are so technologically sophisticated, they respond to materials and methods that give sensory stimulation and genuine feedback.

INTERACTIVE, LEARNER-CENTERED INSTRUCTION

Growing from a basis in CALL, recent MBC and TELL materials, resources in the WWW, and CMC technology will continue to transform the role of teacher and empower interactive, learner-centered language learning. While the practical advantages of MBC and TELL lie both in the presentation of culturally rich materials and in interactive feedback, the next generation of teachers needs to find adequate means of acquiring technological knowledge and skills, within specific language training programs leading to teacher certification or graduate language programs, in order to work most effectively with students.

This discussion approaches the problem eclectically by suggesting specific innovations in material for pedagogical courses and general recommendations for instructors training students, the basis of which stresses exploration, implementation, and reflection. It assumes that the current task-based instructional paradigm, which seeks meaningful contexts for speech acts, to be a viable theoretical basis for language learning (Savignon, 1983; Hadley, 1993). One ever-present question is the appropriate starting point for this discussion: are the new technological options really necessary for students to learn in the most pedagogically effective manner?

How Effective Are MBC and TELL?

In one well documented case, students using a multimedia computer-assisted language learning system (MCALL) at the Universiti Malaysia Sarawak, with absolutely no instructor help, earned significantly higher TOEFL scores, at a reduced cost to the institution,¹ than students who were in conventional, instructor-led classes (Soo & Ngeow, 1998). Questions concerning their competency in oral proficiency, the nature of the motivational factors involved, and the perhaps dubious quality of the instructors aside, the question of what students do achieve in a teacher-mediated format of MBC is of vital

interest. Although the results of teacher-mediated MBC are still dramatically challenged by some scholars (Roche, 1999), the effectiveness and enjoyment of MBC involving an instructor in the language learning process is claimed by both students and teachers in many surveys and studies (Bush, 1997). The best argument for implementing MBC and TELL lies in its unique strengths.

The Strengths of MBC and TELL

The strengths of MBC are that sound, still image, video and hypertext are superior to a course based on a textbook, because the learner has the visual and aural input of real speech in a context (Pennington, 1996; Levy, 1997). The use of interactive exercises in a TELL setting, which give better, immediate feedback based on the learner's answers, is also superior to the completion of material which must be evaluated later. Self-paced learning with MBC and TELL, within the successful task-based instructional paradigm² involving interaction with an instructor and other students, has become an effective course format.

Examples of beginner-level MBC materials include video clips of dialogs and interviews, which a learner can use repeatedly, and often have many "help"³ features that explain the language the learner sees, hears and reads. This pattern of repetition, combined with meaningful "help" on demand, is extremely effective in improving listening ability (Joiner, 1997). Examples of effective cultural resources include hypertexts illustrating the unique traditions and values in a given culture, as well as biographical and historical materials. The material which governments, organizations and businesses place in the WWW can also be adapted for language learning (Green, 1997; Glatz, 1998, Walz, 1998).

Multimedia materials are especially helpful with intermediate level learners, because progress at the level beyond beginner seems slow and student frustration is often high. Hypertext for intermediate level learners is a dramatic advancement, because it allows learners to hear passages, to see the related images and to use the extensive help features. The result of hypertext usage is rapid acquisition of vocabulary (Chun & Plass, 1996) and an improved ability to read (Martinez-Lage, 1997). Reading is an important vocabulary builder (Roche, 1999) and greatly accelerates the ability to comprehend speech, a factor in communicative competence. The entertaining aspect of multimedia is also motivating for learners. Both group – shared learning – and independent individual learning are options with hypertexts.

MBC learning experiences are culturally rich, visually oriented and less frustrating than the traditional, textbook-based instruction. The positive results of MBC materials include an increased ease of oral comprehension and reading ability, an emphasis on speaking in context, as modeled for example in video clips, and grammatical information integrated into the useful passages presented as hypertext. The use of MBC also lends itself to cooperative learning. Concentrated work on specific vocabulary, with which students have difficulty, is possible. The greatest benefit is in the use of better, immediate feedback in TELL, which helps to maintain continued interest in learning. Learners who use MBC and TELL materials are truly a new generation.

TEACHER TRAINING INVOLVING TECHNOLOGY

The issue of training instructors to effectively work with important technological options will be divided into four parts in this discussion: (1) the challenges of MBC and TELL, (2) the challenges of CMC, (3) the role of distance education and online instruction, and (4) recommendations for improving teacher training curricula.

I. THE CHALLENGES OF MBC AND TELL

The new MBC and TELL instructional options challenge students and instructors with many exciting, difficult and unresolved issues involved in converting traditional pedagogical methodology to effective practices mediated by computer technology. These issues relate to two areas of language instruction: (1) presenting of course content to the learner, (2) enhancing each individual's learning processes with feedback. The topic of evaluating each individual's academic achievement by means of assessment technology, which could include testing by means of traditional type questions (true/false, multiple choice, etc.) in a computer format, which also logs answers and calculates scores, is an important issue, but beyond the scope of this discussion.⁴

New teachers must become aware of the MBC and TELL materials available for their given language of instruction and fluent in their practical use. Instead of assuming the practice of passive implementation of commercially packaged content and interactive exercises, often without a direct link to classroom practices, teachers now being trained need to be introduced to and gain solid experience with the

following six pedagogical considerations: (1) the theory and practice of evaluating MBC and TELL materials, (2) the theory and practice of mediating the social context of multimedia, (3) the interface of culture and language, (4) the role of individual learning styles, (5) the role of cooperative learning, and (6) the basics of creating MBC and TELL materials, especially interactive exercises, available to students on local networks, distributed on the WWW, or on transportable media storage systems, such as CD-ROM or DVD.⁵

Evaluating MBC and TELL Materials

The challenges of implementing MBC and TELL materials must be preceded by active involvement in exploring and evaluating MBC and TELL materials, both in regard to technical and to pedagogical concerns (Kassen & Higgins, 1997; Scott, 1998). Such questions as to whether the given materials are able to account for diverse learning styles, or offer an array of "help" options, or have a range of level-appropriate scenes or exercises, must be given equal weight with questions as to whether the graphic user interface (GUI) is logical and inviting or whether the video clips can be effectively interrupted and repeated (Plass, 1998). In the process of learning to evaluate MBC and TELL materials, students training to be instructors attain the necessary level of technical comfort with computer operation. Knowing whether a program or a computer is not functioning correctly can be very important, especially if the number of computers or the time for student use is limited.

A teacher training model suggested by Kassen & Higgins (1997), which they label the Language Learning Technology (LLT) module, stresses that learning to teach with MBC and TELL materials involves five distinct phases: preparation, familiarization, exploration, integration and synthesis. Underlying each phase is the important opportunity for reflection on theory and practice, yielding both knowledge and skill. The end result is technological options integrated into the learning experience for students, from which the instructor can better evaluate other MBC and TELL materials for possible selection.

Scott (1998) emphasizes that graduate teaching assistants (TAs) would do well to relate the technological capability of MBC or TELL materials to underlying pedagogical theories. Scott correctly views three basic learning modes, the sequential, the relational, and the creative, for each of which different

materials are designed. It is also recommended that teachers in training develop research skills for studying how students react to MBC and TELL and their performance with various learning environments. Such inquiry is still quite unevolved, but will influence the development of future MBC and TELL materials (Chapelle, 1998). Scott's analysis compliments the ideas of Klassen & Higgins, also finding that the need for reflection in adopting technology to be crucial.

The following four points are meant to focus on those pedagogical concerns which future teachers confront in both evaluating and implementing MBC and TELL materials, followed by the more difficult area of creating such materials. Each area not only involves a keen concern with the *how* of technological options. It should be emphasized that teachers must also reflect on the *what* and *why* of the materials in a learning environment (Tedick & Walker, 1995).

Mediating the Social Context of MBC

The need for students being trained to teach a foreign or second language to understand the problematic creation and implementation of multimedia is extremely important (Kramsch & Andersen, 1999). Because MBC is itself a mediated social context for language learning, altered and interpreted by the attempt to depict language usage, the crucial role of the teacher to explain and amplify the full cultural background of the material is not diminished, but increased. Although MBC is a much more improved starting point for productive classroom interaction than textbooks, it offers much more detailed material to the student and can therefore be overwhelming.

The student enters into an exploratory mode of learning which must be mediated by the instructor for full understanding. Practical examples of successfully mediating the social context of MBC include: (1) interpreting the appearance and actions of people, (2) interpreting the patterns of interaction between people, (3) interpreting locations and living spaces, and (4) interpreting important objects. Meditation of these four aspects contributes to the acquisition of information in order to compare and contrast both the cultural and socio-economic background of the MBC with that of the individual learners. What may be depicted as common or ordinary, special or unusual, must be explored for its contextual background *and* language usage.

Understanding the language used by the people in the given MBC, while the primary goal of the learner, is but one part of the material. The language is made living, but subject to even greater scrutiny. The competent teacher learns how to use the entire offering for positive learning by exploring with students all the nonverbal material that MBC provides. In focusing then on language usage, which is best understood in terms of this larger contextual background (Frommer, 1998), the teacher has mediated this material and related it to the specific language used.

The Interface of Culture and Language

Word order, verb tenses, and vocabulary usage in meaningful speech acts do not reflect the grammatical order that textbooks seek to impose on a language. The teacher must often mediate the language presented in MBC for effective student understanding. An important part of this role involves the active exploration of the interface of culture and language in the many situations presented in MBC. The use of formal and informal address, for example, is lifted from being a grammatical emphasis to a cultural reality with the students truly being able to recognize the social context behind the language they see and hear.

Because the interface of culture and language is less visible to those who have insight into a particular linguistic region, either as a native speaker or acquired through periods of residency, no activity is more useful to the future teacher than the refreshing experience of working as a beginning language learner with MBC. This process is revealing and enables one upon reflection to be more aware of those aspects of culture which place language in a unique contextual background that must be mediated for full understanding (Kramsch & Andersen, 1999).

The Role of Individual Learning Styles

The nature of an individual student's reaction to any learning environment reflects their unique and often complex motivation and personality, and the fit between classroom dynamics and the individual student's learning style can influence language acquisition (Meunier, 1998). While learning style preferences vary and reflect personality differences, MBC and TELL materials are actually a means to bridge the learning style preferences of various learners in a class. An instructor using MBC and TELL

materials can balance activities that involve linear and concrete thought processes with those that are more interpretative and open-ended.

Although the use of TELL materials is at times more problematic, as the nature of the given interactive exercise and feedback may not fit well with an individual's learning style, the key to effective use of MBC and TELL materials is to assume that any given computer activity is only one of many learning tools in working toward a specific goal. Some learners will indeed find TELL in general more effective for them than others, just as some learners will respond more positively to a certain type of TELL activity than another (Levy, 1997). Practical examples of successfully accommodating individual learning styles include: (1) stressing target vocabulary items by means of activities involving all four skills, (2) supplementing difficult grammatical points with additional oral practice, and (3) introducing tasks which involve negotiating meaning, bridge information gaps, and have many possible means of completion or allow creative answers. The challenge of MBC and TELL materials for the instructor is not so different from that of traditional methodology: to be able to monitor student progress toward language acquisition and provide additional material or activities when necessary.

The Role of Cooperative Learning

The practical implementation of MBC and TELL provides rich opportunities for cooperative learning, whereby students work as partners or in small groups on tasks involving not only listening and reading, but also speaking and writing (Beauvois, 1998). The product of such work can then be taken up in classroom activities. Approaching MBC as a learning environment for students in isolation, alone at a workstation, fails to play to its strength as an engaging and entertaining medium, which allows productive partner and group activities that help all participants. Partners and groups, separated geographically, could in fact meet solely in the context of the same cyberspace learning environment (Hoven, 1999).

Beyond the real world limitation of perhaps not having enough workstations for each learner, which could then be made into an advantage, the use of cooperative learning strategies reinforces the mediated nature of MBC, owing to the interpretative nature of video clips and images. Practical examples of successful cooperative learning strategies include the following: (1) adopting techniques from the use of video in the classroom, such as previewing activities and description activities of images or video clips

without sound, (2) basing role-play activities in small groups on the given situations introduced in MBC, and (3) adapting dialogs and interviews presented in MBC for team writing assignments. Many assignments for individual completion can be the basis of cooperative learning activities. The dynamic contexts of MBC naturally provide excellent material for subsequent class discussions.

Creating MBC and TELL Materials

Few instructors or creators of multimedia have the personal experience of extensive language learning in such interactive, visual environments which are now available. Many teachers have also never been trained to evaluate and implement MBC and TELL materials. There is still, in general, a lack of institutional support for such training. The perception that authoring software is very difficult also remains a stumbling block. Multimedia is often not integrated into the curriculum and outcomes, but fulfills a supplemental role. Although rapid changes in hardware and software do occur, the stability of the WWW is a bright spot for development efforts. Digitizing existing materials (pictures, slides, music, texts, etc.) for use as language learning resources on the WWW, especially on cultural topics, has been a realistic goal for many instructors and programs, although substantial efforts do require the use of an advanced relational database (Pusack & Otto, 1997). The effort at creating cultural resources on-line, and directing learners to authentic materials on the WWW, is already highly developed (Green, 1998; Glatz, 1998; Walz, 1998). The creation of more comprehensive multimedia materials, with advanced interactive exercises giving useful feedback, is an on-going challenge.

The need for future teachers to learn to be fluent in the creation of MBC and TELL materials can be best addressed in a course format which combines students with a technical background with language students.⁶ The instructional format could also be an interdisciplinary team-teaching one, with faculty from a language discipline and from the appropriate technical department, such as instructional design, technical communications or computer science. A good introduction to the process of design grows from evaluating MBC and TELL materials and should continue by offering practical experience in placing materials on the WWW. Such a course would have an emphasis on completing group projects for language learning. Because several WYSIWYG editors⁷ for the Hypertext Markup Language (HTML) as well as many exercise templates available in PERL, Java or Javascript software languages exist in the case of the WWW,

and because the multimedia authoring software choices also include numerous templates and media editors, the core of such a course could take many directions. The ingredients for success, however, would be an emphasis on incorporating various learning styles into the group projects and designing projects of an appropriate scope.

II. THE CHALLENGES OF CMC

The options of CMC also challenge students and instructors with many exciting, difficult and unresolved issues involved in converting traditional pedagogical methodology to effective practices mediated by computer technology. These issues relate to two areas of language instruction: (1) facilitating and monitoring interaction with students, and (2) facilitating and monitoring interaction between students.

The first implementation of CMC by instructors can be daunting. The instructor is confronted with the issue of preparing students both technically and in terms of the expectations of their active participation. It must be remembered, that the effectiveness of technological adaptation is determined in each instance by the level of comfort the participants bring or attain in regard to the requirements posed by such new methodology. No training for instructors in this endeavor is better than the active learning experience of using CMC in teacher training courses as forums for ideas, for experimentation, and for reflection.

The function of CMC can be considered in two ways. The first function is the facilitating of language production in level-appropriate forums and the second function is the monitoring of language use in order to focus on form and offer corrective feedback in a positive manner. The primary choices in CMC methodology are the options of having either synchronous or asynchronous communication and the degree of instructor facilitation and monitoring. The advantage of synchronous communication is that the student input is rewarded with feedback quickly in the form of the responses by other students and/or language models, which can be stimulating and maintain the energy of a discussion. This communication is true cooperative learning. The disadvantage is the grammatical inaccuracy which occurs and must be tolerated.

The advantage of asynchronous communication is in the time and effort students can expend in increasing grammatical accuracy. The choice of instructor and language model involvement as a means of facilitating discussion in either type forum has an impact on the communication. A key question is how to offer feedback without dampening the communicative drive which allows for less grammatical accuracy.

One means is to have individual student input in a CMC forum later reviewed by an instructor for the purpose of returning this input to that individual with error corrections and/or explanations. Another is to have the general problems of several students observed by the instructor discussed in comments and explanations received by all students. Research indicates that the use of CMC can be a means to reduce stress in communication as well as to facilitate self-expression (Beauvois, 1998). The use of CMC is also an excellent source of reading material, in which the students are involved actively (Bernhardt & Kamil, 1998).

The specific CMC technology involved can allow for students to form and engage in smaller group discussions within a forum, with individual students joining and leaving as desired, much like the natural interaction of people at a social gathering. The use of email is another example of asynchronous CMC. The main difference between forms of CMC and classroom conversation is in the ability of the participants to make self-corrections to utterances during production and review that production later (Beauvois, 1998; Kelm, 1998). A full research agenda, however, must be undertaken to understand the nature of the learning occurring in this type of interaction (Ortega, 1997).

A comparison of experiences of students and instructors involved in the innovative use of CMC technology indicates several common themes. Various CMC tools available for local networks and on the WWW facilitate proactive learning and enhance the nature of cooperative learning. The convenience of asynchronous communication, allowing for flexibility in balancing work, school and family schedules, is also a significant benefit. Although the technological skill, as employed for example in engaging in group work electronically, is not the focus of academic achievement, the skills and experiences involved will serve students well in the changing world of employment and life-long learning.

CMC requires more active learning on the part of the student, and enhances cooperative learning among students. In general, because the products of student work are placed in the more permanent forum of electronic bulletin boards or the WWW, which are subject to later review by both students and instructors, the students exhibit a greater interest in meaningful expression in discussions and assignments. Students in CMC have, in fact, been determined to be more productive in the target language (Beauvois, 1997). The future of CMC will be explored, discussed, and debated in the classrooms, the synchronous chatrooms, the asynchronous electronic bulletin boards, and the email of those instructors and students who

participate in expanding the active vocabulary of what constitutes this new language of academic interaction.

III. DISTANCE LEARNING AND ONLINE INSTRUCTION

Evolving out of distance learning courses, based largely on materials on videocassette and teleconferencing, but now incorporating computer technologies, the possibility of language learning in an online-only instructional format may be realized in the coming years. Only if instructors and students can fully utilize CMC options, including advanced audio capabilities, will this format be so effective as to challenge the face-to-face interaction between instructors and students, and between students themselves (Gözl, 1999). The latter is of special consideration. The use of email in a class, for example, which does meet face-to-face will necessarily be different than the communication via email of students who only have this contact. The mediating role of instructors is, however, still an assumption of distance learning and online instructional options.

The unique ability of online exercises to give real, if not individual feedback, is also of note. Whereas the weakest link in distance learning courses is that individual correction of student work is often very delayed, with a long time between student involvement in the task and the student receiving feedback on the completed task (Gözl, 1999), the use of templates to place language exercises in the WWW offers a superior learning experience in distance learning courses. The interactivity of such exercises means that the learning system is functioning as a tutor in the process of completing level-appropriate work. This capability can also be used in courses with regular meetings, so that the teacher in the classroom is engaged primarily in more constructive interaction. The online-only instructional format remains at this time problematic.

IV. IMPROVING TEACHER TRAINING CURRICULA

While many programs have relied on a one-semester course covering the basics of foreign language pedagogy, with the element of computer technology being an additional, but small component in recent years, a thorough review of this curriculum is warranted. A transformation worthy of the enormous changes in instructional practice occurring due to MBC, TELL and CMC requires a new format. The

traditional methods course, covering all material in one semester, would be best altered to integrate the study of the role of computer technology into all aspects of the traditional skills of listening, reading, writing and speaking (Bush, 1997). A second course exploring the critical nature of the mediated social context of multimedia, perhaps even specific to a one language of instruction, would then also be required, in which students started creating MBC and TELL materials.

The state of current language learning materials also shows several important needs, which future teachers will participate in resolving. The need for developers who are teachers, trained in the theory of the mediated social context of multimedia, is foremost. The need for more MBC directed at target audiences based on age, level of instruction, and incorporating diverse learning styles, is crucial. The need exists for detailed analysis of learning patterns in order to improve materials (Chapelle, 1997). The need for partnerships between high schools and institutions of higher education is evident, so that the progressive path of language learning takes an effective hold at an earlier age. Because the need for language learning is strong in the highly mobile, communication-oriented world of the Information Age, and the important advancements in multimedia resources and technology suitable for language learning are greatly helping to meet the challenging requirements of language learners, the teachers of the future must master the technological palette available.

The future will bring more, better, and integrated commercial multimedia product lines, which will often be of a hybrid nature, integrating the latest media storage, such as DVD, with interactive websites. Easier authoring software will help instructors create useful units for the unique needs of individual and/or group language learners. More and better resources on the WWW will be accessible at greater speeds due to increased bandwidth, a key component for quality distance and independent language learning. A solid understanding of the productive implementation of MBC, TELL and CMC technologies must be integrated into teacher training in the depicted manner, in order for the mediated nature of such instructional options to be used to the best possible advantage.

SUMMARY

While the need for students being trained to teach a foreign or second language to understand the problematic creation and implementation of MBC and TELL is extremely important, technology will not

endanger the role of teacher. Empowering interactive, learner-centered language learning brings even greater challenges, but also greater rewards. New teachers, fluent in the materials available for their given language of instruction and in their practical use, will not simply passively implement commercially packaged content and interactive exercises.

Well-trained teachers, who understand the theory and practice of mediating the social context of multimedia, the role of individual learning styles, the interface of culture and language, the role of cooperative learning and the basics of creating their own content and interactive exercises, will be able to meet the challenges of technologically sophisticated learners. While the practical advantages of MBC, TELL and CMC lie both in the presentation of culturally rich materials and in interactive feedback, the next generation of teachers must critically adapt these technological options to the needs of their specific language program. The specific innovations in pedagogical courses and general recommendations for faculty guiding students embarking on the path to second language teaching in the next millennium made here are meant to enliven the discussion on the role of the teacher and of technology in foreign and second language instruction.

NOTES

¹ The remarkable increase in the efficiency of technology, as illustrated by the ever decreasing cost of digital technology in relation to the performance supplied (Bush, 1997, p. 322), is a factor more directly of interest to the administrators who will be supporting language teaching. The reduced cost of technology, as a reason to implement it, does present a positive line of argument with which language instructors can influence such administrators.

² The task-based instructional movement since the 1980's, with communicative competence as the primary goal of language learning, compliments MBC and TELL philosophically because it regards active language usage as the primary goal of interaction between teacher and students (Savignon, 1983; Hadley, 1993). Textbook exercises have little part in such dynamic instruction, but a basis in MBC does.

³ Help features can be specific lexical items, such as providing an accurate translation for the given context, grammatical explanations, such as noting the use of the subjunctive form of a verb, or contextual notes, such as explaining that the use of a given slang term is perhaps only appropriate with friends or family.

⁴ The practice of using MBC, but relying on pencil-and-paper testing, is not invalid, due to the greater expression possibilities of this format, which should indeed be tested. The use of Oral Proficiency Interviews (OPI) is a time-intensive procedure, but is the single best means to test real communicative competence. A computer-assisted version of this method does not yet exist.

⁵ The selection and deployment of specific media storage systems is an important factor, as the generation of the laserdisc and laserdisc player is rapidly being replaced, leaving many programs who adopted quickly at a high cost with outdated, unsupported technology. The stability of the WWW, in which a simple Hypertext Markup Language (HTML) page remains accessible, but for which new extensions are added without effecting simpler HTML pages, is of note.

⁶ This format has been successful at several institutions including the author's college.

⁷ WYSIWYG editors allow the material on the computer screen of the creator to be exactly what the student will view: What You See, Is What You Get.

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