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MODELS FOR DISTANCE EDUCATION IN CRITICAL LANGUAGES

EVOLVING DEFINITION OF DISTANCE EDUCATION

Distance education has been defined differently at different points in history. Traditional or conservative definitions of distance education refer only to a separation between teacher and learner and their use of some means of communication. Such broadly based definitions are of limited utility in the Information Age, since they could apply equally to a correspondence course conducted by post in the 1920s or to a workshop conducted via synchronous Web-based videoconferencing in 2001. As communications technology has evolved from paper and pencil through radio, television, and the Internet, the definition of distance education has changed accordingly, so that newer definitions of distance education have come to include additional criteria. For example, Keegan (1990) suggests that distance education has the following characteristics:

- separation of a teacher and learner throughout the learning process;
- separation of the learner or learners from other learners or learning groups;
- provision of means for two-way communication so that the learner(s) can benefit from or initiate dialogue; and
- utilization of electrical means of communication to carry the content of the course.

In this definition, Keegan has articulated two important features that have come to distinguish distance education in the Information Age: first, in addition to the separation between teacher and learner, communication must be *electronically based*; second, communication must be *bi-directional*. Not only does the student receive communication from the teacher; the student also directs communication to the teacher and to other students.

DISTANCE EDUCATION AND L2/FL INSTRUCTION

Keegan's bi-directional criterion deserves special emphasis in the context of second and foreign language instruction. In the past few decades, specialists in language pedagogy have increasingly come to recognize that language is more a complex set of interdependent skills or competencies than a body of mastered knowledge (Omaggio Hadley, 2001). This recognition has been reflected in two important

areas. First of all, evaluation of learners' competence in a language increasingly focuses on their ability to perform communicative tasks rather than manipulate linguistic forms. Secondly, classroom practices increasingly emphasize the use of actual communication in language learning activities while de-emphasizing the mastery of language metaknowledge, for example, rules of phonology and syntax. In light of this shift, the criterion that distance education media must enable bi-directional communication takes on special importance for language instruction applications. Information Age forms of distance education, due to their interactive nature, are better suited to language instruction. Forms of distance education that do not fit the Information Age criteria cannot fulfill the communicative requirements of modern language instruction.

HISTORICAL EVOLUTION OF DISTANCE EDUCATION DELIVERY MODES

Early in distance education history, paper-and-pencil correspondence was the only means for the transmission of information between teacher and student. Learners engaged in self-instructional home study of course materials, then submitted assignments and/or tests to the course instructor by post. This postal traffic passed slowly in two directions and was certainly not electronic. For these reasons, early correspondence courses offered in the past through such institutions as Great Britain's Open University do not fit the Information Age definition of distance education. (Note: The Open University now offers electronically tutored courses.)

As communications technology advanced, radio and television made the means of transmission electronic, but allowed only one-way delivery of instruction from teacher to student. The lack of an interactive element in such television-based courses as those of NYU's Sunrise Semester (ca. 1950s–1980s) means that courses of this type also do not fit the Information Age definition of distance education.

The advent of interactive television (ITV) technology made it possible to link learners at multiple locations into a single virtual classroom through video and voice transmission, meeting the Information Age imperative of electronically-based communicative interaction. ITV thus became the first form of distance education to meet the criteria of the Information Age definition of distance education.

In the 1960s, the development of computer-assisted instruction (CAI), which includes computer-assisted language learning (CALL), focused on the capability of the computer as "teaching machine" to provide stimulus and feedback to the learner (Saettler, 1990). Before the advent of networking, however, computers could not serve as tools of communication, and so in its classic form one software user on one machine, CALL did not represent a form of distance education at all, but rather a form of self-instruction or independent learning.

Only when universal availability of e-mail and the Web in the 1990s enabled the creation of virtual classrooms in cyberspace did computer-based forms of instruction become bi-directionally communicative. As of this writing, while Internet applications such as e-mail and Multi-User Object-Oriented Environments (MOOs) are still in use, the World Wide Web has completely overshadowed them as a platform for the delivery of distance education.

In the Information Age, ITV and the Internet — especially the Web — have come to dominate the distance education scene. The relative costs and benefits of these two media are discussed below.

INTERACTIVE TELEVISION (ITV)

Among technologies available for distance education, ITV offers the closest replication of the traditional classroom. The face-to-face communication it enables yields particular advantages for teaching listening/speaking to language learners. In fact, it is hard to see how language could be effectively taught at the beginning levels in the absence of such face-to-face interaction. However, ITV is an extremely capital-intensive technology requiring massive investment usually at the state or system level and has geographical limitations as well.

An ITV system serves a limited number of specialized classroom sites linked by special transmission technology. These classrooms are usually located on separate campuses within a large institution such as a state educational network or a state university system. While the system generally serves locations that are geographically remote enough from one another to render commuting impractical, users must still be physically present in an ITV classroom; they cannot study from home.

Typically, a single ITV class does not include more than three or four remote-site locations in addition to the originating site. Moreover, ITV is a synchronous or "live" technology, requiring the presence of everyone in the classroom at the same time. The requirement for fixed class meeting times and the expense of transmitting television signals outside a single system mean that ITV cannot practically and efficiently serve learners across institutional boundaries and across multiple time zones on an ongoing basis. Therefore, while ITV does offer particular educational advantages, it is chiefly an *intercampus* course-delivery system and does not offer global accessibility.

In the context of language instruction, it appears that ITV-based distance education offers the strongest advantages for the teaching of languages in which learners are widely scattered on the ground but still within the single large institution served by the ITV network. Learners at several sites can be gathered together to form a class where previously none was feasible. This means that ITV can help preserve four-skill, first- and second-year instruction in less commonly taught languages in large, multi-campus institutions in which they might otherwise suffer cancellation.

APPLYING THE ITV MODEL ACROSS SYSTEMS

The technology of ITV systems varies considerably from institution to institution, and these differences, though small, may constrain instructors' choices in important ways. A short summary of these differences follows.

Video quality in ITV systems transmitting compressed video over ISDN (Integrated Services Digital Network) lines varies widely, but even the highest quality ISDN is not as clear as full-motion video. In terms of instructional strategies, this would mean that any activity depending on video clarity, such as reading on screen or distinguishing visual characteristics of an on-screen object or person, would have to be used with due caution.

Many ITV systems are videoconferencing systems, some of which are more limited than others. In videoconferencing, it is often impossible to "mix" or compose signals from different sources into a single split-screen image which is visible to everyone. In contrast, full-motion ITV provides signal-mixing capabilities, as in Figure 1, where we see a drawing displayed at one site sharing a split screen with students at another site. In the Hawai'i Interactive Television System (HITS), discussed in further detail in the following chapter, signals are sent from multiple sources — such as cameras at different sites, visual presenters (document cameras), computer displays, or video players — to a central control board where they are selected or "mixed" and re-transmitted as a "program" signal.

Figure 1. A drawing at one site shares a split screen with students at another site

In a videoconferencing environment unable to accommodate mixed programming, instructional strategies relying on mixing images on screen might have to be modified so that images are viewed alternately. This seemingly minor difference could have a noticeable effect on the success of a given activity.

The locus of technical control over the signal differs from system to system. In some systems, the teacher has access to a panel that may control robotic motion of cameras or switching between camera, visual presenter, and computer. In the HITS system, the teacher does not have a control panel; instead, a dedicated technician in a separate control room works in real time to select and mix incoming sources of

input and place them on program. The technician decides what to place on program based on a combination of professional judgment and directions from the instructor which have been given in advance or are given in real time during transmission.

The implications of this difference between systems are twofold: instructors obliged to use the control panel will have to acquire the requisite technical skills, and instructors who must issue directions to a technician will have to deal with the extra time this requires. As technicians become more accustomed to an instructor's repertoire of activities, however, they may begin to anticipate needed camera angles, split screens, and so forth, so that they become active partners in instruction. In a sense, well-informed technicians such as these are "team teaching" with the instructor.

THE WORLD WIDE WEB

THE PRESENT

In terms of its advantages and disadvantages for distance education, the Web is very different from ITV, especially in the context of language instruction. Since the Web is evolving and means many things to many people, a current definition is probably in order: the World Wide Web consists of resources and users on the Internet utilizing HTTP (Hypertext Transfer Protocol), a set of rules for exchanging files, including text, graphic images, sound, video, and other multimedia (searchCRM.com, 2001).

Despite much talk about "virtual classrooms" on the Web, as of this writing the Web is unable to offer anything approaching ITV's replication of the face-to-face communicative environment of the traditional classroom. Despite advances in the handling of streaming media, at present it is still not practical for many learners to be brought together synchronously on the Web for classroom-type instruction including live audio and video such as is found on ITV. While streaming or archived media may be available to learners on the Web, it is unidirectional (from the instructor to the learner) and "canned" (i.e., prepackaged rather than composed in response to ongoing student needs), and students and instructors must rely on keyboarding for two-way communication.

THE FUTURE

Web technology advances quickly, and within the next few years it will become much easier for individual users (such as learners) to send and receive audio and video. Even when this happens, it cannot be assumed that the Web will be a popular medium for synchronous, or live, distance instruction. Due to the universal reach of the Web and the need in instructional contexts to archive submitted materials, it is more likely that teachers and learners will interact asynchronously by e-mailing video and/or audio "messages" to each other or placing them in discussion forums (also known as threaded discussions). Under these circumstances, strong

initiative and autonomy will be required from each user as he or she records and posts to the forums; teacher support will be after-the-fact rather than ongoing in real time.

LANGUAGE INSTRUCTION

Given the current state of the World Wide Web and its probable direction of development, exclusively Web-delivered instruction is probably not appropriate for the beginning levels of language study. With little or no foundation in the language, beginning learners have special needs for instruction in the skills of listening and speaking. Ideally, they should receive ample ongoing, real-time support from a readily available instructor, and at present the Web is unable to facilitate such support. Instead, exclusively Web-based delivery is appropriate for skills other than speaking, and is especially suited to higher levels of language study where learners have established a foundation of reading and writing skills they can use independently as a means for two-way communication.

In contrast to ITV, Web-based technologies are relatively inexpensive, at least in terms of hardware. To the extent that students can be expected to provide their own means of access to the Web, capital expenses are limited to server and network hardware and software. There is no large-scale capital expense comparable to the construction of ITV studio classrooms at multiple sites, although human resources required for Web-based development, such as competitive salaries for good programmers, may be costly.

The portability of the Web means that it is suitable not only for *intercampus* delivery, but also for *interinstitutional* and *individual* delivery, that is, the offering of courses by one institution for another institution or for individuals from outside the institution.

Also unlike ITV, there is no need to consider limitations on the number of remote sites. However, this does not imply that an unlimited number of students may be served, since human factors still enter into determining the optimal size of the learning community and the ideal student/teacher ratio. For instance, given that one would expect an effective instructor to respond personally and fully to all the students online, the teacher's available time and energy would place a limit on the number of students one should have in a Web-based language class.

On the Web, the significance of geography is greatly reduced; learners may study at home, and, if the Web-based course is asynchronous, there is no requirement that all the students in a course log on at the same time. In fact, as long as the use of synchronous tools such as live chat (i.e., a messaging device allowing multiple users to gather in one or more virtual "rooms" to exchange messages in real time) is restricted to a few instances per semester, even students scattered across the globe may be persuaded to take part when synchronous activities are scheduled. So while the Web has certain limitations of application, it does offer global accessibility.

In the context of language instruction, it appears that Web-based distance education offers the strongest advantages for the teaching of languages in which learners with specialized needs for advanced instruction in skills other than speaking are widely scattered on the ground, even across institutional boundaries. This means that institutions with advanced instructional resources in less commonly taught languages can offer those resources to other institutions at which advanced instruction in those languages might otherwise not be available at all, as well as to individuals at widely scattered locations. For some less commonly taught languages, Web-based instruction may represent the only possibility for pulling together sufficient numbers of learners to make an advanced class viable at all. Given this potential for bringing widely scattered learners together at relatively low cost, Web technology will probably become a significant delivery medium for advanced language instruction in skills other than speaking in the near future.

DISTANCE EDUCATION AND DISTRIBUTED LEARNING

All education, not just distance education, has been revolutionized by the availability of electronic resources. The boundaries between distance education and traditional education are dissolving as both distance and non-distance classes make use of multiple technologies, especially the Web, for delivering educational resources — hence the term "distributed learning":

> Distributed learning is an instructional model that allows instructor, students, and content to be located in different, noncentralized locations so that instruction and learning occur independent of time and place. The distributed learning model can be used in combination with traditional classroom-based courses, with traditional distance learning courses, or it can be used to create wholly virtual classrooms (Saltzberg & Polyson, 1995, cited in Bowman, 1999).

Distributed learning models that combine different media to deliver instructional resources are increasingly common. Some of these are detailed below, with particular reference to language instruction.

ITV PLUS WEB-BASED DELIVERY

As noted above, ITV is a capital-intensive medium of instruction. At the same time, more disciplines are making use of ITV resources, and airtime is at a premium. Restricting ITV delivery to a few hours a week and "offloading" appropriate instructional activities to the Web allow an institution to economize on air time. In the language instruction context, during ITV airtime the focus is most logically placed on speaking and listening, while in the Web portion text-based activities, and possibly listening, can be highlighted. While such a model can help alleviate cost issues associated with ITV delivery, like ITV it falls short of providing global accessibility. Another liability of the "mixed delivery" model is its limited flexibility. Articulation from ITV to Web and back again on an almost daily basis requires strict adherence to a schedule, not to mention extremely meticulous planning and preparation — which must itself be factored as a cost.

OFFLINE OR INDEPENDENT LEARNING

Yet another element that may be introduced in a distributed learning "mix" is independent or "offline" learning. In this model of distributed learning, rather than delivering a steady stream of learning activities on an ongoing basis, the provider of instruction focuses on a process of preparing students for independent learning activities, and then following up on those activities. For instance, the following chapter presents a University of Hawai'i case study focusing on a Web-based course incorporating independent student use of a CD-ROM designed for self-instruction. After completing an initial sequence of activities at the course Web site, students use the CD-ROM offline, then return to the class Web site for follow-up and communicative tasks with classmates.

FURTHER DEVELOPMENTS IN DISTRIBUTED LEARNING

Distributed learning is becoming a point of convergence between traditional classroom instruction and distance education as more and more traditional classroom instructors offload portions of instructional activities to the Web. In some cases, Web-based activities, whether independent (such as reading assigned Web sites to obtain information) or group-based (such as threaded discussion), supplant classroom time. In this model, of course, learners do have F2F (face-to-face) time in the classroom, and so there is ample opportunity for treating listening and speaking skills in a communicative format. This "F2F advantage" is lacking in the strictly Web-based courses described above.

As models for distributed learning and distance education develop further, it is to be expected that the advantages of both Web-based instruction and F2F contact may be realized even in distance education situations by distributing the F2F portion of instruction among multiple tutors. In such a model, a Web-based course serves as a central point of contact between students and instructor who are separated by geographic distance. In the Web-based course, some activities are group-based, and some are independent, such as offline use of a CD-ROM. But in addition, as an integral part of the Web course, students are paired with a target language-speaking informant in their locale, recruited especially for the course and trained in a series of Web-based and telephone tutorials to engage in task-based speaking activities with small groups or individual students at specific points in the instructional sequence. The tutors are asked to engage in very specific tasks with the students and are directed to focus to the greatest extent possible on communication, rather than on language forms, during sessions with students. Students are directed to reserve questions about language forms (i.e., grammar and vocabulary) for the Web-based instructor. In this way, these questions and answers can be shared with all the students in a "grammar clinic" threaded discussion. Use of this model, combining the accessibility of distance education with the advantages of F2F contact, enables the Web to serve as the chief medium of language instruction even at beginning and intermediate levels, for which at present the Web alone is not sufficient.

PEER EDUCATION/DISTRIBUTED COGNITION

The definition of distributed learning provided earlier focuses on technological alternatives to the traditional classroom. In this definition, the word "distributed" refers to the distribution of instructional resources across multiple sites (such as ITV classrooms or individual computers) or modes of delivery (such as ITV plus Web). However, learning — especially language learning — has become more distributed in another sense as well in recent years. Advances in theories of learning based on social constructivism (Vygotsky, 1978) and distributed cognition (Pea, 1993, 1994; Salomon, 1993) have highlighted the importance of the background knowledge each learner brings to the learning process, the contributions each learner makes in the learning community, and the interplay between knowledge held in the mind and knowledge contained in artifacts such as learner notes and drafts, reference resources, and records of communicative interactions.

In the wake of these theoretical advances, instructional practices have moved away from teacher-centered models toward student-centered models featuring collaboration, communication, peer editing, and other practices which de-emphasize the teacher as sole bearer of authoritative or meaningful content and validate learners' ability to serve as educational resources for one another. For example, in the Web-based course which is the focus of the following chapter, the first activity in each unit is a "brainstorming" or information-sharing activity in which students contribute words, phrases, or facts that they already know to a class resource list accessible to everyone. Aside from fostering a sense of collaboration among students, this type of activity has the advantage of helping tailor instruction to the real needs of students as demonstrated by their current level of knowledge, rather than as anticipated by a teacher or textbook writer.

MAKING CHOICES FOR L2/FL DISTANCE EDUCATION

As indicated in the preceding sections, evolving definitions of distance education and of distributed learning point the way toward different choices for ITV-based, Web-based, and combined-delivery modes for second and foreign language instruction in different situations. Among the conclusions we can draw are

- Only *electronically-based* modes of delivery enabling *bi-directional communication* are appropriate for effective, communicative language instruction.
- Despite its relatively faithful reproduction of the communicative environment of the traditional classroom, ITV is expensive and limited in the area it can reach.
- ITV is appropriate for teaching beginning levels of less commonly taught languages within a single large, multi-campus institution, especially where student populations are too small to support instruction at a single location.

- Despite its relative economy, Web-based instruction does not (at present) adequately support instruction in speaking and, for this and other reasons, is not appropriate as an exclusive medium (i.e., without supplemental F2F instruction) for teaching beginning levels.
- Models of distributed learning for distance education combining Web-based and F2F components have the potential to strengthen the suitability of the Web as a medium for language instruction at the beginning and intermediate levels, since the F2F component is needed to support instruction in speaking.
- Web-based instruction is appropriate for advanced instruction of students with specialized needs for language development and maintenance in skills other than speaking. In some cases, the gathering together of learners across institutional boundaries to form a Web-based "learning community" may represent the only viable alternative for advanced instruction in a given language.
- With adequate planning and preparation — and careful adherence to a schedule — Web-based and ITV instruction can be combined in appropriate ways to reduce ITV air time and associated expenses.
- Independent, or "offline," learning can be used to advantage in distributed learning models for advanced language instruction. Models featuring independent learning must pay particular attention to preparation for independent work and to follow-up activities.
- Student-centered activities are an important element in modern models for language instruction and add a new dimension to the definition of "distributed learning."

WHERE DO WE GO FROM HERE?

With the advent of the Information Age, distance-delivered education has grown exponentially in a few short years and will continue to grow in the foreseeable future. What is the future of distance-delivered language education? Distance-delivered language education may evolve, or it may decline in a backlash if online learners find that what was promised has not been delivered. Teaching performance-based subjects, such as languages, presents a special challenge for distance educators and distance learners because technology in 2002 does not yet adequately support four-skill language instruction online. Where do we go from here?

Beginning students today cannot learn to speak, listen, read, and write a language effectively when the sole medium of delivery is online instruction. Therefore distributed learning is likely to evolve creatively and with varying degrees of success until online learning can reliably support and deliver multi-modality interaction to a mass audience. Distributed learning, an approach that allows instructor, students,

and content to be situated in different locations and instruction and learning to occur independent of time and place and via multiple mediums of instruction, is likely to be central to any successful distance-delivered language instruction in the immediate future.

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