PREFACE

This Technical Report includes eight papers that were presented at a working group meeting at the University of Washington in September 2001, sponsored by the National Security Education Program (NSEP). The NSEP invited seven universities funded through the Institutional Grant Program to develop a series of case studies on technology and language learning. The working group represented a range of higher education institutions and related organizations across a diverse set of languages using different technological approaches. These cases represent many of the themes and issues confronted when technology-based instruction, or e-language, is used in language programs throughout the higher education community. The following case studies have been written to identify the strengths as well as the shortcomings of new technologies and related pedagogies particularly for teaching the less-commonly taught languages (LCTLs).

In recent years, an increasing number of programs and proposals for teaching the LCTLs using different technological media have been submitted to the NSEP. Upon awarding a number of these grants, we wondered how to assist in supporting these unique programs, as well as how to evaluate their effectiveness. An extensive literature search produced few results. By bringing together individuals and groups that were working with a variety of aspects of technology and different languages it was our hope that we could share experiences and knowledge and determine a research agenda that would inform and guide the field.

This compilation offers many of the lessons learned on the ground, how decisions and choices were made, how mistakes were corrected, and how project staff aimed at a moving target as the technology changed and learning applications became more complex. We offer these cases not to endorse a particular program, promote a specific software or delivery system, or to sell a product. Instead we hope to present a range of options (as well as describe some of their limitations) that will help faculty and universities make more informed decisions about language programming and technology.

OVERVIEW OF CHAPTERS

The following set of cases begin to describe different types of technologies that are used to support language programs (i.e., Web- or ITV-based, and/or audio/video instructional materials) and to help identify what, if any, are the identifiable trends for instructional technologies. They also describe how technology addresses issues of equity (in terms of under-served or under-represented students), issues of diversity (in terms of access to a broader range of language programs in a wider distribution of institutions), and flexibility (times available and accessibility to students).

Chapter 1 provides an overview of the technological landscape, describing and defining the evolution of key terms and characteristics of different instructional technologies. The authors elaborate on the types and uses of different technologies and their cognitive implications. Finally, they lay out where the future trends are and suggest where distributed learning is likely to go in the foreseeable future.

In chapter 2, the authors more closely examine foreign language distance education with a case study of Web-based courses and assessment processes for teaching beginning and intermediate Chinese at the University of Hawai'i at Mānoa. It presents research findings illustrating the instruments and procedures for developing and evaluating Web-based learning environments, performance-based learning experiences, and language competency.

Chapter 3 describes the results of a semester long study that was conducted with 20 students studying Tagalog at Northern Illinois University (NIU). SEAsite (www.seasite.niu.edu) is an Internet site which offers interactive learning resources for Southeast Asian languages, literatures, and cultures. Developed at NIU, SEAsite currently offers beginning and intermediate language instruction in Thai, Indonesian, Tagalog, and Vietnamese. The case study specifically was interested in assessing how these students used different learning strategies with different Web-based tools as they studied new vocabulary words and how this affected their success in learning and mastering the new second language vocabulary. Results of the case study indicate that students who use a variety of learning strategies achieved a higher level of word mastery and retention than those who used only a few of the available strategies.

Chapter 4 examines the technological and pedagogical considerations that shaped the production of the CenAsiaNet Web-based video modules, piloted at Indiana University. CenAsiaNet is intended as a resource for educators and curriculum developers who would like to utilize the potential of the Internet, but are overwhelmed by the array of questions that arise with the endeavor. By detailing the many choices made by the CenAsiaNet team, it offers an example of how to implement an Internet-based approach to material design for language instruction.

NASILP serves as the largest and oldest national forum for the interchange of ideas and expertise toward the development and support of self-instructional academic curricula for the LCTLs. With support from the NSEP, NASILP has worked with a consortium of academic units to develop four technologically oriented projects including the Critical Languages Series™ (CLS) of CD-ROM sets for six LCTLs; the MaxAuthor™, dedicated to the production of language materials for CD-ROM and the Internet; LCTL FAQ pages for Internet delivery, addressing language-specific questions frequently asked by both students and teachers; and the Internet delivery of hyper textual multimedia informational resources to students, tutors, examiners, and coordinators working with the NASILP system. This case study in chapter 5 is devoted to identifying the impact of these technological innovations on the teaching and learning of LCTLs in the United States.

The Five College Foreign Language Resource Center's development of Web-based, multimedia materials to supplement the study of language and culture relies on its fleet of international students to shoot appropriate video in the target country. They used this method in designing their NSEP-funded Web site, LangMedia. Chapter 6 will examine the impetus for the site, the decisions that went into its design, and the integral role played by international students in the overall construction of LangMedia.

Finally, in a project developed by Montana State University-Bozeman in cooperation with the University of Washington and Al Akhawayn University in Morocco, chapter 7 discusses how to combine resources in an inter-university consortium to make LCTL education more affordable and enable their more continual and frequent offering.

APPROACHES TO LESS COMMONLY TAUGHT LANGUAGES IN HIGHER EDUCATION

In light of the recent tragic events in the United States, there can be little debate that the era of globalization has brought increasingly diverse and complex challenges to our national security. There has been a dramatic revisiting of our capacity to effectively deal with evolving economic and political changes at the global, regional, and local levels. With this renewed reflection comes an increasing demand for professional expertise and leadership bolstered by a broad mix of international skills, including the ability to communicate and understand the languages and cultures of key world regions.

Increasingly, higher education institutions have recognized the importance of their role as the leaders of innovation and change as trainers and educators for the society of the twenty-first century. In recent years, faculty and administrators have begun to embrace the challenge by expanding interdisciplinary curriculum and creating new courses that internationalize programs and disciplines. They have also worked to integrate new learning technologies into the classroom and expanding opportunities for distance education. The higher education community has also become more attuned to the practical skills needed by its graduates to meet the demands of living in a global society by creating opportunities for partnerships with government and industry. Clearly, in our inter-connected world there is an increased need for students to develop international skills — essential to these skills are competencies in area and language knowledge.

Now more than ever before, there are increased demands for language competent professionals across a variety of disciplines, with the ability to communicate in everyday, culturally appropriate interactions. Moreover, the recent tragedies underscore the need for language and cultural skills in areas outside of Western Europe. These growing and changing needs for foreign language competency, especially in the "low-density" or less-commonly taught languages have resulted in a

large scale efforts to rethink language programming, both in terms of which languages are offered and at what levels. However, the general problem of low enrollments, limited access, and high costs of teaching LCTLs are critical issues for language faculty and higher education administrators. For nearly a decade, the imperative of the NSEP has been to seek partnerships with higher education institutions to develop an infrastructure to enhance language acquisition in the LCTLs as well as higher levels of language competency as part of its overall mission.

As we move ahead to explore the development of an institutional infrastructure for LCTLs, we must confront a number of important questions: What are the goals and purposes of these language programs? What are the most effective learning environments for teaching uncommonly-taught foreign languages? Which pedagogical tools are most effective and what are the technical issues for designing their delivery systems? What are the different considerations for designing interactive, distributed, and or stand-alone language resources? How can we design courses and select curriculum materials to address the broad range of language skills — including speaking, reading, listening, and writing — needed to operate effectively in a global environment?

Research in second-language acquisition and learning has been carried out for over a century, more recently yielding important knowledge about the way different language learners acquire language proficiencies. In terms of language instruction, there has been a distinct shift away from the more traditional approach to language instruction — based on grammar and syntax — to a more eclectic approach emphasizing communicative competence or fluency. There is a general lack of well-designed studies that identify and control for the multiple variables that influence language acquisition (namely learning environments, instructional approaches, individual and group differences, and differences across languages). Studies that do exist generally fail to address differences across levels and types of language instruction and are limited by small sample sizes. The high investment in time and resources needed to carry out longitudinal or impact studies on language competency has also hindered research efforts in this area (e.g., the Department of Education proposal for the extensive research on distributed learning by SEAsite [http://www.seasite.niu.edu] highlights this concern).

As previously mentioned, due to low enrollments and high costs, most institutions are unwilling to offer courses in the less-commonly taught languages, and for most students only the commonly taught languages are generally available as standard, classroom-formatted instructional programs. In response to this shortfall, many institutions opt for technology-based language programs for the LCTLs because they are perceived to be highly cost-effective instructional solutions. Hence, technologically based language programs represent the only opportunity for language instruction in many languages and the only access to second-language learning for students at remote locations. Consequently, there has been a growing demand for teaching materials and instructional resources that allow students to develop and maintain proficiencies in the LCTLs. Yet, this development of new

pedagogies and application of new instructional technologies raises new sets of issues about their effectiveness in meshing with traditional classroom practice.

There is a paucity of research explaining or predicting phenomena related to language acquisition through technology. Research in computer-aided or technologically based language learning has a shorter history and a more complicated set of research problems than traditional language methods. For example, most studies are limited to students in a particular university using custom software in a particular learning environment, whereas these conditions are impossible to control for in online, Web-based, or ITV-based programs. A review of the literature suggests that there are very few qualitative or ethnographic research studies, and even fewer quantitative analyses, of the relationship between technology and language acquisition. The effectiveness of various second language teaching methods has long been debated, as have concerns over how, where, when, and in what order learning activities should take place. Most instead emphasize the broad reaching research on technology and learning processes. Our concern is more limited but equally important; our case studies are designed to discover ways in which different technologies have been used in university settings to teach a variety of languages at different levels of competency.

NSEP'S CASE STUDY INITIATIVE ON
LANGUAGE LEARNING AND TECHNOLOGY

To understand the limitations and capabilities afforded by new technologies and language learning, NSEP is supporting research and development to describe and evaluate the current state of the field and develop clear benchmarks for progress. We have used the following key issues to frame the overall objectives of the case study research: identifying the different forms of technology used in existing language programs, descriptive explanations of the ways technology is used to support and enhance language learning, assessment and/or evaluation of different forms of language media and their applicability with a variety of languages in multiple settings and levels, analysis of the required resources (both material and physical) and an examination of "cost-effectiveness" of technology-based instruction, and finally, the development of "benchmarks" or indicators that can be used by faculty or institutions to consider the format and type of technology to support new language programs. Specifically, the case studies were created to answer the following questions:

1. *What are the current instructional technologies used in language programs and who are they used by?* What are the current forms of technology used in language programming at universities in the United States? (For example, are they ITV, Web-based, or via video/audio instructional materials? Are these part of collaborative or consortial arrangements, and if so how are resources shared?

2. *What are some of the primary uses for technology in language programs?* How is technology used? Is it a primary instructional delivery system? Is it supplemental to a traditional language classroom? Is it used as part of a distance learning program? What types of infrastructural support and distribution mechanisms are used?

3. *How do we assess and evaluate language competency?* Which technologies are most appropriate at different levels (beginning, intermediate, advanced) of learning? What kinds of materials are most appropriately covered through language mediated uses of technology?

4. *How do we measure resources, support, and costs of e-language learning?* What resources are required to develop, implement, and maintain technologically based language programs? What are the costs? What time is required for training/faculty development and support/tech support/etc.? How does this compare with traditional language instruction?

5. *What are the benchmarks for technologically based language programs?* How is language competency measured? What are the different assessment tools? How does this approach address issues of equity (in terms of under-served or under-represented students), issues of diversity (in terms of access to a broader range of language programs in a wider distribution of institutions), and flexibility (times available and accessibility to students)? What is the attrition rate and what are the explanations given?

These broad research parameters are important because they provide both descriptive and quantitative analysis of language programming in higher education that can inform the field and help make policy recommendations about new ways to address and increase our national language capacity.

With the wide range of expertise in language pedagogy, instructional technology and program development that has been supported in each of these NSEP-funded programs, we hope the research supported by this framework will generate further comments and a lively discussion in the international education and foreign language fields. Each of the individual case studies addresses different aspects of the research questions. The purpose here is to map out the landscape of the major issues and concerns in this area, and then explore the "fit" or lessons learned for developing other programs. We strongly encourage you to contact the authors or our office to comment on or add to the ideas presented in this edited compilation.

PROMISES AND PITFALLS OF
TECHNOLOGY IN LANGUAGE LEARNING

The issue of successful technology-based strategies for second language learning is wide open for exploration. E-language (as it is sometimes known) learning is here and growing. Obviously a number of design and implementation issues factor into the learning environment. These range from attitudes of the learners, study habits,

types of activities provided, and the time and willingness of users to participate on tasks. We also know that a variety of components are available to support language instruction — including culturally situated exercises and projects, authentic materials and experiences (especially audio and video), methods that appeal to a variety of individual learning styles and abilities, and everyday or authentic interactions that address real information needs of learners. Yet, how do we begin to address these in an electronic learning environment? Through access to Web sites, audio/video materials, and interactive television, new forms of technology afford the luxury of making available a variety of "realia" in remote learning environments. It also accommodates the learner by providing the information in a variety of formats, as individual learners vary in their skills, background, and language backgrounds. It enables individuals who may vary in their skills to come to a learning activity and complete it at their own pace, possibly accessing additional resources if needed. Finally, e-language enables additional informal forms of communication through e-mail, chatrooms, discussion forums, newsgroups, and teleconferencing that help enhance fluency and expand language use. New forms of technology in all their diversity offer a wide range of learning opportunities for second language learners. The task of course is navigating these resources and creating optimal learning environments.

GUIDING QUESTIONS:
MAPPING THE LANDSCAPE OF E-LANGUAGE LEARNING

1. *What are the current instructional technologies used in language programs and who are they used by?*

Our first area of concern centers on the different forms of technology used as a medium of instruction in higher education and who are the target audiences. A study by the National Education Association (NEA, 2000) on distance learning revealed the following: distance learning faculty and traditional faculty teach courses in the same academic fields; 82% of distance learning courses are at the undergraduate level, while 16% are at the graduate level; 70% of the courses fulfill a requirement, while 20% are an elective course; and of those institutions offering distance education, at least 58% used Internet-based courses, 54% used two-way interactive video, and 47% used one-way pre-recorded video.

Also according to the NEA study (2000), Web-based distance education faculty rated their courses better than traditional courses in the following areas: access to information, high quality course material, mastering subject matter, assessing educational effectiveness of the course, and addressing the variety of student learning styles. Faculty rated distance learning courses the same as a traditional course in improving quantitative skills and developing student interactivity. They believe distance learning will reach many students who cannot take traditional college courses and that smaller institutions will be able to offer a richer curriculum, especially Web-based programs because most can occur at any time and any place. Finally, the Web-based faculty rated their distance learning courses worse than a

traditional course in strengthening students' group problem-solving skills and helping students deliver oral presentations.

These figures counter some of the expectations that distance learning courses are emerging disproportionately in selected areas of study. In another example, a study conducted by the Council for Higher Education Accreditation (CHEA), revealed that at both 2- and 4-year institutions a trend in distance education is to increase the number of courses using asynchronous computer-based technology (or Web-based applications) as opposed to offering courses that use one-way or two-way video. (CHEA, 2000, p. 2). Identifying these trends in the context of language programming can begin to provide a framework for understanding more complex issues about program development, support and institutionalization. Through the current available technology many language programs are now available to wider audiences in different locations, with different education and language experiences, and different learning expectations. As we will see in the following chapters, which technologies are used and how they are used has several pedagogical considerations.

2. *What are some of the primary uses for technology in language programs?*

Our second area of interest is how technology is used. Whether as part of a primary instructional delivery system or integrated with other programs as supplemental to a traditional language classroom or part of a distance learning program, the use and application of technology will impact differently on language pedagogy and ultimately on language acquisition. The literature points to an important distinction between the different forms of technology as language-based technology and non-language-based technology (Salaberry, 2000). The former is designed specifically for language-related tasks, and includes speech recognition and synthesis, lemmatization, syntactic categorization, vocabulary extraction, parsing, and text generation. As some of the following case studies illustrate, addressing technical issues such as selecting hardware or software is of critical importance for program design and pedagogical implications. The cases discuss their decision-making processes behind their selections and the applicability of different hardware/software, especially in working with other fonts and numerals.

The latter (which is complementary, but not as exclusive) includes hypertext, digital audio and video, database technology, and networked communication. It is also of interest to know whether and how technology is used to enhance cultural awareness (i.e., Is using video beneficial in providing visual images of behaviors, and as a result does it increase the awareness of local values and culture that are not available through text?). And if so, how it is used increase access to broader, interdisciplinary information (such as geopolitical concerns or primary source materials)?

Another issue that has arisen through the case study examples is whether a trend exists toward integrating multiple computing or technological resources. While not endorsing a particular software or hardware application, these and other similar

figures on trends in technology-based language learning offer insight into the "how" and "why" of language programming, as well as address some of the benefits and limitations of one approach over another.

    3.   *How do we assess and evaluate language competency?*

One question driving the case studies was which technologies are most appropriate for which levels of instruction? Hence, case studies start to answer how language competency is measured, what different assessment tools are available, and whether or how text, sound, video, or any combinations of these have proved more effective in language acquisition.

Several of the case studies focus on the assessment and evaluation of learning and measurement indicators for how different technologies impact on language development. While it seems straightforward that different applications and exercises would benefit learners at different ability levels in different ways, how individuals with a variety of skill levels can use the same applications is unclear. In addition, mutually agreed upon (or externally measured) language competency indicators are a relatively new and unpracticed concept in most language programs. Few examples of language measurement instruments exist, especially for the LCTLs, and those that do are often expensive and have a relatively small pay-off. To remedy this oversight the development of a variety of examples of different forms of assessment or guidance on evaluation of technologically based language programs can help in their development and improvement.

    4.   *How do we measure resources, support, and costs of e-language learning?*

A fourth area centers on the resources and cost effectiveness of developing, implementing, and maintaining technologically based language programs. Most universities are seeking a cost-effective instructional format to offer LCTLs on a regular basis to a very small number of students. However, despite the assumption that using technology lowers costs and increases access, current developers and users assert that technologically based and distance education is often more expensive than a comparable traditional course.

A study on distance education done by the Institute for Higher Education Policy (NEA, 2000) found that many faculty worried that they would suffer financially because persons teaching distance education courses are likely to do more work for the same amount of pay and because they are not fairly compensated for their intellectual property. They also felt they would have to spend more time mastering the procedural as well as the declarative knowledge to teach languages through technology. In terms of demanding more time from faculty, 53% of those actually teaching a distance learning course reported spending more hours per week preparing and delivering it and in spite of spending longer hours preparing and presenting, 84% said they receive no course reduction for their work, and 63% are compensated as if their distance learning course were part of their normal course

load (NEA 2000, p. 50). Costs are also incurred by faculty requiring training in the use of new technologies and by institutions requiring technical support and infrastructure maintenance.

Issues of cost and extra time spent in preparing for and teaching distance learning courses raise concerns over faculty incentives and recognition of the additional work that goes into preparing and teaching remotely. In fact, most DL courses are taught by technology savvy junior faculty, and at present, the academic reward system does not take into consideration their extra time, effort, and expertise when it comes time for promotion and tenure. The issue of incentivizing faculty to teach DL courses (because of their potential to reach a broader range of students and their ability to increase the level and types of languages universities offer), should be given greater thought in higher education planning.

In addition to the expenses incurred by the training and maintenance of technologically apt faculty, there are high attrition rates in LCTL programs resulting in weak return of language expertise. In spite of the huge technological investments incurred to develop tech-based programs at certain levels of language instruction, in most LCTLs, students drop out by the third year of study. For example, approximately 75% of students beginning Russian will drop out by the third year of study (Brecht, Caemmerer, & Walton, 1995). Based on the literature, one can conclude that the bulk of resources in Russian programs are directed to the general education mission, where there are little applied or language specialization skills. When it comes to allocating resources and evaluating the return on the investment for supporting instructional technology, these issues weigh in heavily on decisions to support or establish programs for LCTLs.

Much of the research suggests that the greatest benefit of technology in language acquisition is through the collaborative development of resources, and that benefits are realized in the area of those languages for which there is a significant demand, but which have insufficient numbers of students (i.e., the less-commonly taught languages, special purpose courses in common languages such as business Russian, and highly specialized advanced courses; Symposium on Technology and Foreign Language Learning, 1996). Inter-university or interdepartmental collaboration demands that institutions share technological resources, and establish the infrastructure and mechanisms for archiving, organization, and dissemination processes. Hence, a few of the case studies in this compilation have identified the specific infrastructural support, collaborative, and distribution mechanisms that different institutions have chosen to utilize.

5. *What are the benchmarks for technologically based language programs?*

The last area of concern centered on the development, institutionalization, and evaluation of technology-based language programs. According to current understanding, the benchmarks for institutionalizing and also evaluating a language program must include and measure the following:

- Institutional support: infrastructure issues, technology plan
- Course development: design, delivery, technology used
- Teaching/learning: pedagogy, student interaction with faculty, feedback to students
- Course structure: course objectives, library resources, student expectations
- Student support: admissions, financial aid
- Faculty support: assist in transition from classroom teaching to online instruction

Hence, the challenge put forth by these case studies is to establish which technologies are commonly used and which are best suited to specific areas of second language teaching (such as speaking, vocabulary, grammar, reading, writing, and assessment) and by whom. Some of these case studies start to shed light on ways to target public resources to the poorest beneficiaries, enabling poor or under-served students to overcome the cost and time barriers to language learning. Based on the issues that were briefly introduced above, we hope the case studies will begin to clarify where and how technology is used to teach languages (i.e., in what fields of study, levels and types of languages, and whether for required or elective courses) and to help illustrate whether and how these applications are successful.

CONCLUSION

As a government-based grant-giving organization in this era of concern about program effectiveness we felt that criteria for organizing and measuring language programs and disseminating their results should be established. In order to explain how technology addresses issues of equity, diversity, and flexibility in language programming, important indicators should be considered by anyone investing in technology for language programs. Our collective experience pushed us to include and address the following questions in the case studies: Are costs prohibitive for a substantial number of students? Is technology defeating or supporting our effort to increase access by reaching a more diverse set students? Are students who are using technology or learning at a distance disadvantaged by in terms of quality of content, input and delivery, are there other factors that support or impede their learners compared to their peers in traditional classrooms? Are there data suggesting that these students fare as well or better if they use these non-traditional learning methods? Are there only a few language communities or certain types of institutions that can offer computer and Internet access, highly competent teachers, self-guided curricula, and so forth to students? Finally, what are the success rates of these programs, how is effectiveness measured and what are the explanations given?

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