

International Distance Education: A Pilot Study at Asia University

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Abstract

In recent years there has been a rapid and widespread increase in the use of multimedia in institutions of higher education. The use of multimedia in such institutions is closely associated with the increasing availability of new technology in the world. International distance education (IDE) by telecommunications is a recent trend in education enabling learners and teachers to communicate more easily and effectively over long distances.

Asia University (AU) in Tokyo is one university that has employed IDE for English language learners who have returned from study abroad programs. The qualitative results of a pilot study using video teleconferencing revealed positive responses as to the use of IDE to facilitate learner motivation and improve or retain English ability after returning to Japan. This paper gives a background and description of IDE, describes the pilot study and results, and discusses further development of IDE and other considerations.

Introduction

The rapid advance of multimedia and telecommunications technologies has helped to create an international community, transmitting information across the globe with little time constraints. Through this advance, it is possible to know and see what is happening around the globe at any time.

Distance Education, Distance Learning, Open Learning

Now, educational institutions are also using multimedia and telecommunications technologies to educate students. Today, a student of English in Japan can receive lessons from a teacher in the US or anywhere else in the world via modern technology. Such education over distances, or distance education, is increasingly being adopted by institutions of higher education. Brown (1996) defines distance education as "a means by which instruction is offered to learners who are geographically separated from the provider and often described in terms of the technological devices used." Distance education is the rubric that classifies education or learning outside traditional institutional boundaries and is thus institution centered rather than learner centered.

Students who are taught via distance education partake in distance learning — "a process of instruction characterized by separation of the learner from the source of instructions" (Brown, 1996). In this process learning is facilitated by providing the learner with links to the originating site for transfer of information and interaction with the teacher. In distance learning, separation of the learner from the instructional source may be only a few meters or thousands of miles.

Distance education and distance learning are encompassed in the greater construct of open learning. Open learning embraces the modes for delivery of

learning materials to learners who are at a distance. The Internet and satellite televised instruction exemplify open learning. The Open University in England is one institution which promotes open learning. It is the largest and most innovative educational and training organization in England. The learner is at the center of open learning, and educational providers deliver, on a cooperative/collaborative basis, learning materials configured to the needs of the learners. Though distance education tends to be institution centered, the actual education that takes place via open learning is learner centered. It attempts to extend the learner's existing knowledge, experience, and skills and is premised on the philosophy that learning is lifelong.

Examples of IDE

IDE involves the three categories of distance education, distance learning, and open learning. Seoul National University in Korea (SNU) and the University of California at Los Angeles (UCLA) implemented a longitudinal study of IDE from 1990 to 1993 (Saga et al., 1992). The system used a two-way interactive network based on a computer autographic system. UCLA delivered linguistics and English literature courses and SNU delivered Korean history courses (Appendix A). In Japan, AU professor Kenji Saga organized a Study Group on Multimedia Application to International Distance Education (SGMAIDE) in 1990. In 1993, SGMAIDE set up a high-tech device, PictureTel KV-4200, in the Computer-Assisted Instruction (CAI) classroom at AU so that students could easily interact with people on the computer monitors (two people per monitor).

PictureTel compresses the video and allows the signal to be carried through international Integrated Services Digital Network (ISDN) services across the Pacific Ocean. With PictureTel's terminal, it is possible to have fully interactive video teleconferencing internationally. In September of 1993, AU implemented

experimental video teleconferencing with Dr. John Tiffin's class at Victoria University in New Zealand. In the first session, Dr. Tiffin talked about *Telecommunications and the Trade in Teaching* and discussed the history of telecommunications and the possibility of integrating virtual reality technology into telecommunications. In the second session, Professor Saga delivered a talk about *The Future of International Telecommunications and Internationalization of Education in the Pacific* and discussed the necessity of international cooperation in the Pacific region in order to promote international telecommunications. In 1995, IDE practice sessions with KDD, the largest international telephone company in Japan, Liaison Offices in Sydney, Australia and in Kuala Lumpur, Malaysia were undertaken in a lecture style. The titles of each session were *Telecommunications Policy and Services in Australia and Australia's Information Superhighway Development Plan* and *Malaysia's Telecommunications: Present and Future Vision Toward 2020*. Approximately 80 students participated in the question-and-answer session following the lecture.

Definitions of Multimedia

IDE uses multimedia and telecommunications technologies to educate learners internationally. In the Free Online Dictionary of Computing on the World Wide Web, multimedia is defined as, "Human-computer interaction involving text, graphics, voice and video" (Howe, 1997). Duber (1996) defines multimedia as "a shortened form of the notion of desktop multimedia — a very recent development which brings digital audio and video to personal computers, which had previously been limited to text only." For education, Tillyer (1996) states that multimedia is "a material that combines sound media with visual input, authoring capabilities, [*sic*] printed word."

The Network College of Communication in the Pacific

Technological developments such as widespread availability of the Internet, virtual reality, and compressed video teleconferencing, now enable learners and teachers to communicate more easily and effectively over long distances and to facilitate teaching and learning. The Network College of Communication in the Pacific (NCCP) is an organization seeking to improve the quality and availability of international educational exchange through the use of telecommunications and information technologies. Currently 12 institutions are members of NCCP (Appendix B) and are using IDE to achieve a system of electronic education by developing a cooperative infrastructure among universities in the Pacific.

Cost of IDE

As universities begin adapting new technologies to classroom use, there are "increasing pressures on universities to become more cost-effective and more accessible to an increasingly diverse range of students and learners" (Bates, 1995). As well as bridging the distance gap, IDE by international ISDN is cost-effective in that it is less expensive than using global satellite systems such as INTELSAT and non-INTELSAT satellites. With PictureTel's terminal, the cost of transmitting the program equals the cost of two international telephone calls (128 kilobits per second) between the US and Japan, or less than \$300 per hour. It is now possible to have free video teleconferencing via Cu-SeeMe on the Internet. However, at this time, because of traffic congestion on the Internet, the transmission speed of IDE by international ISDN is much faster than that of Cu-SeeMe. Particularly, because some of the pipes carrying the transmissions among sites are not large enough on the Internet, students may observe ghost images when rapid movement occurs in real time on Cu-SeeMe.

Transmission of IDE

As the world shifts to an information-oriented society, there is an increasing demand for diversification and sophistication of telecommunications networks. In terms of the development of international telecommunications networks, various optical fiber submarine cables have been in operation across the Pacific Ocean. ISDN is "a set of communication standards allowing a signal wire or optical fiber to carry voice, digital network services and video" (Howe, 1997). ISDN meets the needs of telecommunications services.

International ISDN service is available as transmission media and video conference systems are available as terminal equipment in the practice of IDE. ISDN makes it possible to integrate graphics, text, and sound in video teleconferencing. The standard transmission rate is 64 kilobits per second (kbps). This ISDN connection is called DS0 and is the lowest level of circuit. There are six different kinds of ISDN connection (Howe, 1997):

DS0	1 channel PCM at 64 kbps;
T1/DS1	24 channels PCM at 1.54 Mbps;
T1C/DS1C	48 channels PCM at 3.15 Mbps;
T2/DS2	96 channels PCM at 6.31 Mbps;
T3/DS3	672 channels PCM at 44.736 Mbps;
T4/DS4	4032 channels PCM at 274.1 Mbps.

Each channel is equivalent to one voice channel. T2 and T4 are rarely used, though T2 is occasionally used over microwave links (Howe, 1997). The advantage of using ISDN for audio and visual communication is the relatively low user costs, which are the same as normal telephone charges at the transmission rate of 64 kbps. ISDN is offered by local telephone companies but most readily

accessible in Australia, France, Singapore, and Japan (Howe, 1997).

Internationalization of Education

Historically, cultural transfer has occurred as a consequence of military, political, and religious activities such as invasion, war, and settlement. Today, cultural transfer is occurring as a consequence of economic and social activities. The Pacific Economic Cooperation Conference (PECC) introduced the idea of the Triple T Revolution: transportation, telecommunications, and tourism (Tiffin, 1993). The PECC Triple T Task Force defines *transportation* as the flow of goods, *telecommunications* as the flow of information, and *tourism* as the flow of people. Countries around the Pacific, including Japan, Australia, New Zealand, those in the ASEAN, Canada, the US, Korea, Taiwan, and China, expect that the Triple T Revolution will explore ways in which the countries can cooperate economically in the future. The Japanese Triple T Task Force has cooperated with the New Zealand PECC Committee by looking at the implications for education and training. John Tiffin of Victoria University in New Zealand suggested a fourth T — teaching — defining it as a free flow of knowledge and skills.

The need for a free flow of knowledge and skills creates a new role for education which might be defined as the “internationalization of education.” The internationalization of education has begun at certain universities. Through the use of new media (the Internet and other multimedia technologies), it is now possible for people to gain instant access to information from other countries without leaving their own countries. Universities around Japan are increasingly employing educational exchange programs and using the Internet. AU is a good example of a Japanese institution which promotes the internationalization of

education.

A Pilot Study of IDE at AU

Students at AU can participate in a five-month study abroad program in the US called the Asia University America Program (AUAP). AUAP has been integrated into the regular curriculum of the four faculties of AU; it is a compulsory program for the faculty of International Relations sophomores and an optional program for sophomore students of the faculties of Economics, Law, and Business. Over 5000 students have taken part in AUAP since the pilot program in 1988.

At AUAP, students gain an understanding of American life and culture while improving their English communication skills. In order to help post-AUAP students retain and enhance their English language proficiency, Kenji Saga organized SGMAIDE. SGMAIDE, which consists of university faculty members, works to gather information about how other institutions of higher education around the globe have effectively and efficiently implemented distance education. In 1992, SGMAIDE did a pilot study of IDE through video conferencing with Oregon State University (OSU), a former AUAP consortium school. The theme of this IDE study was *A Trial of Distance Education Between OSU and AU*. The participants were faculty members, students, and staff members at AU and OSU. In the opening session, then AU President Shinkichi Eto and OSU President John Byrne exchanged greetings. In the first half of the first session (English), students discussed how their AUAP experiences had affected their lives. In the second half of the first session (Japanese), Professor Rosenberger at OSU discussed the development of IDE between AU and OSU with the AU faculty members. In the second session (English), Professor Jon Root, the director of

distance education at OSU, talked about *Present and Future: Distance Education at OSU* for 40 minutes, which was followed by 20 minutes of questions and answers.

Video teleconferencing is two-way electronic communication between two or more groups in separate locations via video and audio (Touchstone, 1996). There are some advantages to implementing interactive video teleconferencing in the classroom. IDE by interactive video teleconferencing is effective because it:

- 1) allows real-time visual contact between students and the instructor or among students at different sites (Touchstone, 1996);
- 2) enables connection with experts in other geographical locations (Reed & Woodruff, 1995);
- 3) supports the use of diverse media (Reed & Woodruff, 1995). Black/Whiteboards, overhead projectors, and videos etc. may be incorporated at all sites.

The limitations of interactive video teleconferencing include:

- 1) when both conference sites use different video teleconferencing equipment, video teleconferencing is impossible because of the different compression systems;
- 2) if the system is not properly configured, there might be an inappropriate audio/visual effect;
- 3) the initial cost of the equipment and using ISDN service to transmit conferences may be prohibitive to some institutions (Touchstone, 1996).

Figure 1 (Saga et al., 1992, p. 95) shows the system of the video teleconferencing.

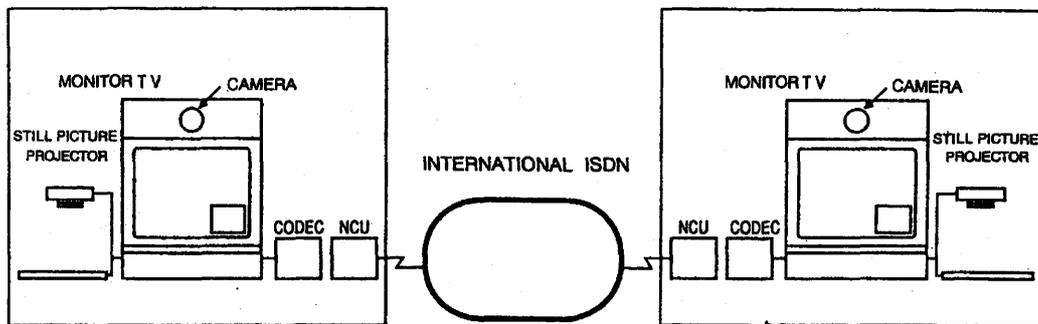


Figure 1 The System of Video Teleconferencing by International ISDN

Subjects

Twenty-six subjects ($n=26$) participated in the study. Subjects included 15 AU students who had participated in the AUAP program (seven male students and eight female students), six faculty members, and five university staff members.

Method

A questionnaire was administered to all subjects after they had participated in the video teleconferencing lecture. The questionnaire included five questions measured quantitatively with *agree* or *disagree* and two questions measured qualitatively using open-ended questions (Appendix C).

Data Analysis

Table 1 shows the frequencies and percentages of subjects' responses (agree or disagree) on items 1 through 5. The frequencies of staff members (sm), students (s), and faculty members (fm) who responded with *agree* (ag) and *disagree* (dis) are shown. The total frequencies and percentages of *agree* and

disagree are also shown in Table 1.

Table 1. Frequencies and Percentages of Subjects' Responses on Items 1 Through 5.

Item	No. of subjects (ag)			Total (ag)	No. of subjects (dis)			Total (dis)
	fm(n=6)	s(n=15)	sm(n=5)	n=26(%)	fm(n=6)	s(n=15)	sm(n=5)	n=26(%)
1	6	15	5	26(100)	0	0	0	0 (0)
2	5	13	4	22(85)	1	2	1	4(15)
3	3	8	3	14(54)	3	7	2	12(46)
4	5	10	5	20(77)	1	5	0	6(23)
5	3	5	4	12(46)	3	10	1	14(54)

Results and Discussion

Table 1 shows that all of the participants thought that AU should consider implementing IDE. Eighty-five percent of the participants claimed that IDE would be effective for classroom use. This indicates that most of the participants believed that IDE is appropriate for classroom activities. Fifty-four percent of the participants stated that IDE would be effective for seminars. Seventy-seven percent of the participants mentioned that IDE would be useful for pre-AUAP orientation. All of the staff members claimed that IDE would be useful for pre-AUAP orientation. Forty-six percent of the participants mentioned that IDE is effective for video teleconferencing. Students who responded positively to video teleconferencing claimed that they wanted to exchange opinions with AUAP students in the US.

The participants were asked to respond to two qualitative questions related to their IDE experiences. Question six was "In what other ways do you think that IDE would be applicable?" Responses included IDE being applicable for US-JAPAN symposia, library information access among universities, international

lectures, and classroom use for new courses such as Intercultural Understanding.

Responses to question seven "What do you think about IDE?" included:

I want to learn via IDE in my classes;

It's very interesting. I expect that AU will introduce IDE as soon as possible;

Many students should experience IDE;

Through IDE, I want to be able to take courses from non-US universities;

I realized that I have to study English more in order to learn IDE successfully;

I wish AU could have the same video conferencing studio as OSU;

I wish AU could have a larger TV monitor for IDE.

Most participants stated that they liked being part of this new technology and that the experience would benefit them in the future. There was face-to-face, fully interactive teaching and learning taking place in a warm and caring environment that is as effective as traditional methods (Moore & Thompson, 1990; Verduin & Clark, 1991).

With such positive responses from students, staff, and teachers regarding IDE, it was imperative that AU consider expanding available facilities. Initially the use of a satellite was considered, but it was too expensive for AU to adapt the system. Instead, AU considered installing video conferencing equipment in the CAI room. As a result of the pilot study with OSU, AU adapted the video conferencing technology.

Other Aspects of IDE that Need to be Considered

There are four factors which influence the development of IDE: 1) time differences, 2) development of international ISDN and cost-effectiveness, 3) selection of topics and teaching strategy, and 4) management of equipment.

Time Differences

Distance education is a great educational tool for those who need "flexible learning opportunities independent of time and place" (Bates, 1995). When implementing IDE, one consideration is time differences. For example, the time difference between Tokyo and Seattle is 17 hours. In this case, a convenient time slot must be chosen within this 17-hour time difference for IDE to function.

Development of International ISDN and Cost-Effectiveness

In order to implement IDE successfully, we need to develop international ISDN infrastructure and services and continue working toward increasing cost-effectiveness. If ISDN becomes more affordable, more institutions of higher education will be able to integrate it into their regular college curricula.

Selection of Topics and Teaching Strategy

It is important to develop criteria for selecting topics and teaching strategies for IDE so that it is relevant to the learners. Furthermore, it is essential to have a standard teacher-training program so that the quality of distance education can be maintained. For example, both OSU and the University of Alaska have been developing a teaching strategy handbook in order

for teachers and students to be able to maximize the pedagogical effectiveness of distance education (Greydanus, Root & Pribyl, 1991; "Distance education," 1992).

Management of Equipment

In order for IDE to integrate smoothly into university curricula, trained technical support staff is necessary. It is crucial for institutions of higher education to have adequate staff who can appropriately manage equipment such as video teleconferencing systems, cameras, and microphones in order to maintain the high quality of teaching. Thus, hiring capable staff or training existing staff to appropriately manage equipment also plays a role in IDE's overall cost-effectiveness.

Conclusion

Ultimately, international telecommunications have great potential to facilitate students' motivation and to enhance the effectiveness of university education. In the future, integrating technologically developed virtual reality, the Internet, and multimedia into IDE will maximize IDE's effectiveness and efficiency. Also, IDE students will experience a far greater variety of education, courses, and instructional styles than they could on a single campus. Experiments like NCCP's interactive video teleconferencing are taking place all over the world and represent another aspect of the free flow of knowledge and skills. Future students have the possibility to earn credits from a consortium of universities using telecommunications and will be able to acquire a degree that would be recognized around the Pacific. With the rapid shift to a borderless society, further research on IDE is necessary, specifically longitudinal studies

exploring the effect of IDE on students' performance. Research on the development of appropriate IDE curricula is also essential.

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Appendix A

SNU-UCLA TELELINK SCHEDULE: FALL 1990

	Seoul LA	9AM 5PM	Tues. Monday	Wed. Tuesday	Thurs. Wednesday	Fri. Thursday	Sat. Friday
OCTOBER 1990			15	16 Linguistics: Syntax D. Sportiche (U) — D. W. Yang(S)	17	18	19
			22 "ON Park, Un-Shik" Y. H. Shin(S) — J. Duncan(U)	23 Linguistics: Syntax D. Sportiche (U) — D. W. Yang(S)	24 Public Health Sumi Mo & Moon Shik Zong(S) — D. Jelliffe(U)	25	26
	Seoul LA	9AM 4PM	29	30 Linguistics: Semantics E. Keenan(U) — C. M. Lee(S)	31		
NOVEMBER 1990	Seoul LA	9AM 4PM				1 Fine Arts: Exchange of Student Works SNU — UCLA	2
			5	6 Linguistics: Semantics E. Keenan(U) — C. M. Lee(S)	7 Public Health: "World Nutrition" D. Jelliffe (U) — Sumi Mo(S)	8 "on Shin Ch'ae-ho" Yong-ha Shin (S) — J. Duncan(U)	
			12	13 Shakespeare R. Watson(U) — Chongsook Lee (S)	14 State & Economic Development Kwang-Woong Kim(S) — J. Aberbach(U)	15 Fine Arts: Exchange of Student Works SNU — UCLA	16
		19	20 Linguistics: Syntax in GB T. Stowell(U) — Chungmin Lee(S)	21 Shakespeare R. Watson(U) — Chongsook Lee (S)	22 Video Conference on Language Processing Maddieson(U) — S. O. Lee(S)	22 Holiday Thanksgiving	23 Holiday UCLA
		26	27 Architecture & Urban Planning Kwangno Lee(S) — George Rand(U)	27 Shakespeare R. Watson(U) — Chongsook Lee (S)	28 Public Health: "Nutritional Assess. & Growth Monitor D. Jelliffe(U) — Sumi Mo(S)	29 "New Nationalism" Young-Woo Han (S) — John Duncan (U)	30
DECEMBER 1990	Seoul LA	9AM 4PM	3 Linguistics: Phonetics/ Field Methods Maddieson(U) — S. O. Lee(S)	4	5 "An Overview on the History of Korean Thought" Yong-ha Shin (S) — Duncan	6	7

Appendix B

The List of 12 NCCP Institutions

1. Asia University
2. University of Hawaii
3. Macquarie University
4. Chulalongkorn University
5. Victoria University of Wellington
6. Simon Fraser University (David Lam Center)
7. Program on Cultural Studies (East-West Center)
8. Advanced Telecommunications Research
9. New Zealand Council for Educational Research
10. Japan-American Institute for Management Science
11. Asian Mass Communication Research & Information Center
12. Center for International Research on Communication and Information Technologies

Appendix C

Questionnaire

Please read each item, and choose a response (agree or disagree), and circle the word.

[Quantitative questions]

- | | | |
|---|-------|----------|
| 1. AU should think about the implementation of IDE. | agree | disagree |
| 2. IDE is effective for classroom use. | agree | disagree |
| 3. IDE is effective for seminar use. | agree | disagree |
| 4. IDE is effective for the pre-AUAP orientation. | agree | disagree |
| 5. IDE is effective for video conferencing. | agree | disagree |

Please read each question, and write your ideas.

[Qualitative questions]

6. In what other ways do you think that IDE would be applicable?

7. What do you think about IDE?