

# Far Eastern Universities: A Documentation of Computer Availability and Funding

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*This study, based on a survey research method, documents the types of computer technologies found in five Far Eastern universities as well as how university department chairs are funding their purchases and what they report they need. Pentium computers were the most frequently identified computer technology, although the total number of computers available for faculty and students appeared to be far lower than the number needed. Most funding came from university and department monies, but almost one-third of the respondents reported a need to use their personal money for technology purchases. Respondents identified a need for more hardware, software, and computer upgrades.*

The interest in international travel for educational purposes has steadily increased in recent years. As reported by James Coffin, director of international programs at Ball State University, the number of students studying abroad has almost doubled since 1993 (personal communication, August, 1997). Both students and teachers are taking advantage of opportunities to travel to broaden their cultural and international educational awareness. It would be advantageous to know the technological equipment available in other countries to allow those traveling to be aware of the kinds and availability of computers. The types of computer technologies, the location of the computers, how their purchase was funded, and future technology wants and needs are discussed in this paper.

Such information is not only pertinent to those students and faculty members traveling abroad, but also to those teaching in an office systems environment. As the student make-up of classrooms and faculty are becoming more multicultural, it is important to know what technology is a part of other educational systems. Being aware of what possible technological knowledge the students and teachers possess, helps instructors teach at a more appropriate level.

## Related Literature

Even though the Far East has become more accessible for educational exchanges, a search of the literature revealed that few studies involved computer availability and funding in Far Eastern universities. Therefore, it was difficult to contrast and compare findings in this study to those of others. However, studies were found that dealt with technology in elementary and secondary schools in the Far East. Watanabe and Sawada (1990) investigated the availability of microcomputers and their infusion into elementary, lower secondary, and upper secondary schools. Other elements of their study included: how computers were acquired, location of the computers, types of equipment, and software development and use. The study noted problems observed by the teachers centered on software, training, and funding. It was also noted that the introduction of computers into schools was just beginning.

In Australia, Downes, Perry, and Sherwood (1995) investigated information technology in

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university-level education and teacher education. The Downes et al study described the types of classes that students were taking and would take in the future. This study also looked into the future by asking how funds at the universities studied would be spent for future technology needs. Two universities, Griffith University in Queensland and the University of Western Sydney in New South Wales, were investigated. A European study found that for business use, information technology was significantly less available when compared to the United States (Denton, 1997).

A study describing Chinese universities found that qualified instructors, as well as up-to-date computer equipment within the educational system, were needed (Yong-Wee, 1993). Gao (1989) summarized technology in China by noting a great shortage of equipment and qualified instructors. Chinese institutions have historically focused on student training and, therefore, had little use for computer technology for research purposes. Only in recent years has this changed at the university level. Still, the policy has often been to send Chinese students abroad to learn computer technologies instead of making investments in computers and computer education at universities in China. Gu (1984) concluded that the Chinese need to focus on reforming higher education through communication with other countries worldwide.

A chronological review of technology that focused mainly on government and business involvement was conducted in Korea (Ministry of Science and Technology, 1996). The authors concluded that as early as the 1960s there was a need to improve science and technology education. As the country moved into the 1990s however, research and development became a more important issue than simply improving science and technology. Authors reported that the government is making efforts to heighten the awareness of science and technology to the youth and general public (Ministry of Science and Technology, 1996).

Korean universities appear to have focused on providing trained labor for local industry and not on innovations in technology (Carnoy, 1994). Research has been limited to industrial

development purposes, and technology training has frequently been imported from other countries. Carnoy (1994) stated that Chinese universities, with their small group of graduate students, view research training as important; however, skills "for adopting technology and for innovating" is done once they get on the job (p. 75).

## Purpose

Educational exchanges are becoming more readily accessible for university students and faculty, as indicated by statistics from Ball State University, a mid-sized, Midwestern U.S. university. An increase from 235 students in 1995 to 427 students in 1997 with accompanying faculty was reported (J. Coffin, personal communication, August, 1997). With the increase in educational exchanges, it is, therefore, important to be aware of technology that is available at universities in other countries.

The purpose of this study was to determine the types of microcomputers at selected universities and their location, how computer funding was obtained in the departments, and given available funds, what computer materials would be obtained. The following research questions guided this study:

1. What are the types of microcomputers used at the university and where are they located?
2. How is computer funding obtained in the departments?
3. Given available funds, what computer materials would be obtained?

## Research Sites

While on a university educational exchange in China, Korea, and Japan, researchers collected data to provide a demographic profile of faculty members as reported by department heads. The university director of the Far East Exchange Program had provided the researchers with a contact person at Ball State University sister-universities—two from each China, Korea, and Japan. The sister-universities were: Shanghai Teacher University and Wuhan Institute of

Physical Education (China); Kyung Hee University and Sangju National Polytechnic University (Korea); and Aichi University of Education and Tokyo Gakugei University (Japan). Five of the six universities agreed to participate, and their department heads responded to the four-section survey. Only Tokyo Gakugei University (Japan) did not participate. The researchers sent the contact person at each university the surveys via U.S. mail or facsimile. The contact person was asked and agreed to copy and distribute the survey to every department head of every college (across all curriculum areas) in their particular university.

### The Survey Instrument

The survey consisted of four sections: demographics, hardware, financial, and additional information. The demographics section requested the department name as well as the number of faculty members in the department. The hardware section requested the types of computers available to students and faculty as well as the campus location of the computers. The financial section requested information on the source of funding for computers and what computer materials would be purchased if additional funds were made available. An additional section was included to allow the department heads to share any additional comments about technology at their universities.

Graduate assistants, students, and faculty reviewed the content of the survey. The Ball State University graduate assistants and students were from China, Korea, and Japan. The graduate assistants' reviews were especially necessary for translation purposes and possible language barriers during the translation period. The faculty reviewed the survey for content validity as well as ease of presentation of the material. As a result of all reviews, several modifications were completed. International graduate assistants translated the English language survey into Chinese, Korean, and Japanese languages.

Translated and English language versions of the revised surveys were sent via facsimile or U.S. mail to a contact person at each university who

then asked department heads to complete the survey for pickup by the researchers at a specified date.

### Data Analysis

Data for three of the four survey sections were analyzed using descriptive statistics, which included frequencies and percentages. The fourth section of the survey was a comment-based section; therefore, qualitative information was summarized. The hardware location data were viewed in table format with the number of departments indicating the types of computers available to students and faculty and the locations of those computers. The financial data were divided into the number of departments and percentages by 1) how funding was obtained for technology; and 2) what computer materials would be purchased if additional funds were available. Results are presented in narrative and tabular form as appropriate.

### Findings

Sixty-four department heads, representing all curricular areas, agreed to complete the survey; however, two department heads did not include information about the number of faculty in the demographics sections. In total, over 1000 faculty members were represented in these sixty-four departments.

Table 1 addresses Research Question One by illustrating the number of department responses indicating the various types of computers and their locations. Hardware options were 286, 386, 486, Pentium, Apple/Mac, Other, and None. The computer location choices were shared faculty offices, faculty department offices, department student labs, department student classrooms, and university computer centers. Respondents could check all that applied to their particular situation.

Thirty-eight respondents noted that Pentium computers were located in faculty department offices. Only three respondents noted older 286 machines in a student lab or class. A total of thirty-two respondents implied Pentium computers were available for student use in labs

**Table 1: Summary of Hardware Availability and Number of Faculty**

| Types of Computers | Shared Faculty Office | Faculty Department Office | Department Student Computer Lab | Department Student Classroom | University Computer Center            | TOTAL       |
|--------------------|-----------------------|---------------------------|---------------------------------|------------------------------|---------------------------------------|-------------|
| None               | 20                    | 17                        | 26                              | 56                           | 26                                    | 145         |
| 286                | 0                     | 0                         | 2                               | 1                            | 0                                     | 3           |
| 386                | 5                     | 6                         | 7                               | 2                            | 2                                     | 22          |
| 486                | 9                     | 13                        | 14                              | 0                            | 11                                    | 47          |
| Pentium            | 34                    | 38                        | 27                              | 5                            | 27                                    | 131         |
| Mac                | 8                     | 5                         | 9                               | 2                            | 7                                     | 31          |
| Other              | 1                     | 1                         | 0                               | 1                            | 2                                     | 5           |
|                    |                       |                           |                                 |                              | <b>Total Areas for Computer Usage</b> | <b>384</b>  |
|                    |                       |                           |                                 |                              | <b>Total Number of Faculty</b>        | <b>1107</b> |

or classrooms. Thirty-one respondents indicated the use of Apple/Macintosh computers for students and faculty use.

Pentiums seemed widely available, as respondents noted 131 locations. However, the number of Pentiums is considerably low considering this study involved over 1100 faculty. There were many departments that noted no availability of computers, especially in the area of departmental student classrooms.

Two respondents also noted in the additional comments section that each faculty member in their institution was supplied with his/her own notebook computer and two respondents reported the availability of faculty labs. One respondent reported that the faculty computers were connected to a local area network. Other responses: faculty office computers are used for their jobs; it is necessary to use own personal computers for research; student labs are used mainly to word process papers; since we do not have enough computers, students have a hard time studying; every lab has computers for research; and LANs are used for word processing, statistics, sharing information, and connecting to the Internet.

In summary, the respondents noted that it was necessary for faculty members to use their own personal computers and it was noted that not

enough computers were available for student use. Local area networks were being used for a variety of purposes such as word processing, sharing information, connecting to the Internet, etc.

Research Question Two asked how computers were funded and what type of computer materials would be obtained if

additional funds were made available. Table 2 shows the number of department heads responding to the types of funding, percent of the number of departments indicating the type of funding, and the additional computer materials information. Since multiple sources of funding are available, respondents could indicate as many of the various categories that applied to their situation.

Almost three-quarters (73.4%) of the respondents indicated that university funds were used to purchase computers. Twenty-one of the respondents (32.8%) indicated that departmental funds were used to purchase computers. Almost thirty percent of the respondents (29.7%) stated that personal money (faculty purchase their own) was used to obtain computers.

Research Question Three asked what materials would be obtained if additional funds became more available. In responding to this question, over half (57.8%) of the respondents indicated that they would purchase hardware, and half (51.6%) indicated that software programs would be their choice. Almost half of the respondents (45.3%) stated that additional funding would be used to purchase upgrades. Repairs and maintenance were selected by nearly a third (29.7%) of the respondents, and a quarter (25%) reported they would need facilities support

**Table 2: Financial Information for Computers and Materials (N= 64)**  
(Note: Respondents could choose all that apply.)

| How do you obtain computer funding?                                | <u>N</u> | <u>%</u> |
|--|----------|----------|
| University Funds   | 47       | 73.4     |
| Departmental Funds   | 21       | 32.8     |
| Personal Money   | 19       | 29.7     |
| Donations  | 4        | 6.3      |
| Government   | 2        | 3.1      |
| Other  | 2        | 3.2      |
|  |          |          |
| What computer materials would you purchase with available funding? | <u>N</u> | <u>%</u> |
| Hardware   | 37       | 57.8     |
| Software Programs  | 33       | 51.6     |
| Upgrades   | 29       | 45.3     |
| Repairs/Maintenance  | 19       | 29.7     |
| Facilities Support   | 16       | 25.0     |
| Lab Assistants   | 16       | 25.0     |
| Other  | 2        | 3.1      |

and lab assistants. Other responses included: we need more computers; we need to increase the LAN; we need more software; we need more funding for computers; we need Pentiums for statistics; we need more programs written in different languages; we use individual funds for purchasing computers; we use personal research funds for purchasing computers; most computers are used for word processing, but sooner or later they will be hooked to the network; it is in the primitive stage in that not all the computers are on the net and they lack sufficient specialized software; even though computers are not luxury goods any more, it is very difficult for us to get the budget to buy computers; we would purchase books about computers and computer training if more funds were available; we have started to use computers widely on campus, but most computers are running rather slowly; upgrading and technical training are urgently needed.

According to the respondents, technology needs included computer upgrades, more hardware and software, and an increased use of Pentiums, books, local area networks, and funding. It was difficult to get funding for technology and many faculty members spend their own money to obtain computer hardware and software.

Table 3 displays the specific departments that responded, as well as the number of faculty and locations of the computers (See Table 3).

### Implications

Universities world-wide continue to struggle with trying to keep up to date with new technological advances. It is

imperative that universities attempt to obtain the newest and best technological knowledge or be left behind in the increasingly competitive business world. This trend was documented as early as 1989, yet remains applicable today (Calude and others, 1989). As the cost of technology continues to decline, universities world-wide must learn to use computers effectively.

This study is important because educational institutions across the world are becoming involved in educational faculty and student exchanges. For example, at Ball State University, international study exchanges have nearly doubled in number since 1993 (J. Coffin, personal communication, August 1997). Due to this trend, it is important that these types of studies be conducted, especially in light of the need to be able to work with available technology no matter where you may be in the world.

**Table 3: Department & Hardware Information - 286, 386, 486, (P)entium, (M)ac, (N)one, (O)ther**

| Department   | No. of Faculty | Faculty Computer Access | Shared Faculty Office | Faculty Dept. Office | Dept. Student Lab | Dept. Student Classroom | University Computer Center |
|--|----------------|-------------------------|-----------------------|----------------------|-------------------|-------------------------|----------------------------|
| Accounting   | 5              | Y                       | P                     | P                    | P                 | N                       | 486/P                      |
| Accounting   | 8              | Y                       | N                     | 486                  | N                 | N                       | 486                        |
| Agriculture  | 5              | Y                       | M                     | P/M                  | M                 | N                       | M                          |
| Architecture   | 13             | Y                       | P                     | N                    | P                 | N                       | P                          |
| Auto Engineering   | 6              | Y                       | P                     | P                    | P                 | P                       | P                          |
| Biology  | 12             | Y                       | P                     | 486/P                | 486/0             | N                       | P                          |
| Chemistry  | 11             | Y                       | P                     | 486                  | N                 | N                       | P                          |
| Chemistry  | 2              | Y                       | P/M                   | N                    | P/M               | N                       | 486/P                      |
| Children Education   | 5              | Y                       | P                     | P                    | P                 | N                       | P                          |
| Children Welfare   | 100            | Y                       | P                     | P                    | P                 | P                       | 486                        |
| Chinese Literature   | 4              | Y                       | N                     | P                    | N                 | N                       | N                          |
| Computer Center  | 8              | Y                       | P                     | N                    | N                 | N                       | 386/486/P/M                |
| Computer Science   | 8              | Y                       | P                     | P                    | P                 | P                       | P                          |
| Division 1 - includes Philosophy, History, Geography, Psychology, Disabled Education | 100            | Y                       | 386/486/P/M           | P                    | N                 | N                       | N                          |
| Division 2 - includes Math, Physics, Chemistry, Biology, Geology                     | 43             | Y                       | P                     | P                    | N                 | N                       | N                          |
| Division 3 - includes Fine Arts, Physical Education, Home Economics, Nursing         | 79             | Y                       | 486/P/M               | P                    | N                 | N                       | N                          |
| Economics  | 12             | Y                       | N                     | N                    | N                 | N                       | P                          |
| Education  | 5              | Y                       | 486                   | 486                  | N                 | N                       | N                          |
| Electrical Engineering   | 5              | Y                       | P                     | P                    | 286/386           | 286/386                 | P                          |
| Electronic Engineering   | 12             | Y                       | P                     | P                    | P                 | N                       | P                          |
| English  | 4              | Y                       | N                     | P                    | P                 | N                       | P                          |
| English Literature   | 6              | Y                       | N                     | N                    | N                 | N                       | P                          |
| Flower Science   | 5              | Y                       | P                     | P                    | N                 | N                       | N                          |
| Food Science   | 7              | Y                       | M                     | M                    | N                 | N                       | M                          |
| French Literature  | 6              | Y                       | N                     | P                    | P                 | N                       | N                          |
| Industrial Design  | 5              | Y                       | N                     | N                    | 386/486/P/M       | N                       | N                          |
| Industrial Engineering   | 7              | Y                       | M                     | N                    | P/M               | N                       | N                          |
| Information & Media  | 17             | Y                       | 386                   | N                    | N                 | N                       | N                          |
| International Business   | 17             | Y                       | P                     | 386/P                | N                 | N                       | P                          |
| International Relations  | 6              | Y                       | N                     | P                    | N                 | N                       | 486                        |
| Japanese Literature  | 17             | Y                       | P                     | P                    | P                 | P                       | N                          |
| Journalism & Communication   | 5              | Y                       | N                     | N                    | 486               | N                       | 486                        |
| Landscape  | 11             | Y                       | 486                   | 486                  | P                 | N                       | P                          |
| Law  | 12             | Y                       | N                     | 386/486/P            | 486               | N                       | N                          |
| Management   | Not Dec        | Y                       | P                     | P                    | P                 | N                       | P                          |
| Management   | 29             | Y                       | P                     | P                    | P                 | N                       | N                          |

**Table 3: Department & Hardware Information - 286, 386, 486, (P)entium, (M)ac, (N)one, (O)ther (Continued)**

| Department             | No. of Faculty | Faculty Computer Access | Shared Faculty Office | Faculty Dept. Office | Dept. Student Lab | Dept. Student Classroom | University Computer Center |
|------------------------|----------------|-------------------------|-----------------------|----------------------|-------------------|-------------------------|----------------------------|
| Management             | 14             | Y                       | N                     | N                    | 486/P             | N                       | N                          |
| Math                   | 6              | Y                       | 486                   | P                    | 486/P/M           | N                       | P                          |
| Math                   | 70             | Y                       | 486/P                 | 486/P                | 486/P             | N                       | 486/P/M                    |
| Mechanical Engineering | 12             | Y                       | N                     | 386/486/P/M/O        | N                 | N                       | O                          |
| Medical Science        | Not Dec        | Y                       | P/M                   | P/M                  | P                 | M/O                     | N                          |
| Nuclear Engineering    | 7              | Y                       | N                     | N                    | 386/486/P         | N                       | N                          |
| Nursing                | 17             | Y                       | 486/P                 | 386/486/P            | 486               | N                       | N                          |
| Office Admin           | 7              | Y                       | P                     | N                    | N                 | N                       | N                          |
| Office Admin           | 3              | Y                       | 486                   | 486                  | N                 | N                       | 486                        |
| Oriental Medicine      | 53             | Y                       | N                     | N                    | N                 | N                       | P                          |
| Pharmacology           | 8              | Y                       | 386                   | 386/486              | 386               | 386                     | 386                        |
| Philosophy             | 5              | Y                       | P                     | P                    | P                 | N                       | N                          |
| Physical Ed.           | 15             | Y                       | N                     | N                    | M                 | N                       | M                          |
| Physical Ed.           | 14             | Y                       | P                     | P                    | 486               | N                       | N                          |
| Physics                | 9              | Y                       | 386/486/P/M/O         | 386/486/P            | 386/486/P/M       | N                       | 486/P/M/O                  |
| Political Science      | 8              | Y                       | N                     | P                    | N                 | N                       | P                          |
| Political Science      | 8              | Y                       | P                     | P                    | N                 | N                       | P                          |
| Science                | 120            | Y                       | P/M                   | P                    | P/M               | P/M                     | N                          |
| Sociology              | 4              | Y                       | P                     | P                    | P                 | N                       | P                          |
| Spanish                | 4              | Y                       | P                     | N                    | N                 | N                       | N                          |
| Tae Kwon Do Education  | 4              | Y                       | N                     | N                    | M                 | N                       | M                          |
| Texture Science        | 10             | Y                       | N                     | P                    | 486               | N                       | N                          |
| Urban Planning         | 11             | Y                       | P                     | P                    | N                 | N                       | P                          |
| Not Declared           | 10             | Y                       | P                     | P                    | 386/486           | N                       | P                          |
| Not Declared           | 7              | Y                       | N                     | P                    | N                 | N                       | N                          |
| Not Declared           | 6              | Y                       | P                     | M                    | N                 | N                       | N                          |
| Not Declared           | 5              | Y                       | 386                   | P                    | N                 | N                       | N                          |
| Not Declared           | 73             | Y                       | 486/P                 | 486                  | 286/386/486/P     | N                       | 486/P                      |

Being aware of the technology around the world will create an atmosphere for successful educational exchanges. The findings from this study can be expanded beyond faculty and student exchanges into our own classrooms. The knowledge can help us understand the technological abilities of international students

and fellow faculty members. International technology advancements or lack of advancements are topics included in our classrooms and training sessions. Our ability to prepare and help those traveling abroad (or be prepared ourselves) is essential.

## Recommendations for Further Research

Future research could be conducted in this area to further our knowledge of the availability of technology and to continue to help those faculty and students involved in educational exchange programs. The authors are currently involved in an additional study with these same universities to describe their curricular use of software and hardware as well as future technology plans at these universities. Future research could also be conducted within the United States to develop a comparison and contrast of these findings.

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