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ABSTRACT

Survey results are presented from a study of the steps being taken by the 52 Illinois public community colleges to develop and provide programs in high technology fields. First, high technology programs are defined as those occupational programs that educate and train individuals to operate, maintain, and/or repair micro-electronic or computerized machinery or equipment, or to fabricate or analyze new materials, such as plastics or alloys. Next, information is presented by program on the number of colleges offering particular programs, fall 1982 enrollments, 1983 program completers, and job placement rates of completers. In addition, a summary is provided of the high technology programs offered for 30 or more semester credit hours, or less than 30 semester credit hours. Study highlights include: (1) all but three colleges offered programs in one or more fields defined as high technology; (2) 45 colleges offered computer programming, 31 offered electronics engineering technology, and 18 offered radiologic technology programs; (3) 23 colleges offered courses of less than 30 semester credit hours in computer programming, 11 each in computer operating and word processing, and 10 in data entry; (4) 19 colleges offered courses of 30 semester credit hours or more in word processing and 16 in computer programming; and (5) the computer programming degree programs enrolled 18,184 students in fall 1982, and 62.4% of the 1,337 program completers were known to be placed in jobs. (HB)

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Introduction

In the spring of 1983, the House of Representatives of the Illinois General Assembly passed a resolution (HR 84) requesting the Illinois Community College Board (ICCB) to survey the 52 public community colleges in Illinois "to determine what active steps are being taken at each institution to develop and provide" programs in high technology fields. (A copy of the resolution is found in Appendix A.) To comply with this request, the staff of the ICCB developed a definition of high technology, assembled information previously submitted to the ICCB by the colleges on high technology programs and courses, and constructed a survey to elicit additional information. All 52 public community colleges were surveyed in September 1983.

Definition of High Technology

For this survey, "high technology" programs were defined as those occupational programs that educate and train individuals to operate, maintain, and/or repair micro-electronic or computerized machinery or equipment or to fabricate or analyze new materials, such as plastics and alloys. (A listing of program fields included in this definition is found in Appendix B.)

A number of occupational fields with high employment demand were not included in this definition and, thus, were not included in the survey. These programs, however, are vital to the economic well-being of the citizens of the districts in which they are offered and to the state of Illinois. Those fields with high employment demand that were not surveyed include, for example: nursing (both associate degree and practical), basic nurse assistant training, emergency medical technician (ambulance and paramedic), dental assisting and dental hygiene, coal mining technology, petroleum technology, hotel/motel and restaurant management, secretarial sciences, and small business administration.

Although the greatest percentage increase in number of new jobs by the year 2000 is predicted to occur in "high technology" occupations, the federal Department of Labor predicts that the greatest absolute number of new jobs created will be in "low technology," service-providing occupations. The public community colleges in Illinois will need to continue to provide education and training for both kinds of occupations, as well as transfer education, remedial education, and adult basic and secondary education, for the citizens within their districts.

Survey Results

All but three colleges are offering programs in one or more fields included in the definition of "high technology" used for this survey. Two of these three expect to initiate one or more programs within the next three years, while the third is in a multi-college district in which other colleges in the district are offering programs. Only six colleges do not currently offer programs in computer programming, of which five are in multi-college districts in which other colleges offer computer programming and the sixth expects to initiate a program by next fall.

Tables 1, 2, and 3 on the next three pages show the number of high technology programs currently approved at the Associate of Applied Science degree (minimum of 60 semester credit hours), certificate of 30 semester credit hours or more, and certificate of less than 30 semester credit hour levels, respectively. For each type and level of program, the tables show the number of colleges with approved programs in Fall 1982 and Fall 1983, the headcount program enrollment in these programs in Fall 1982 and Fall 1983, the number of FY 1983 (Summer 1982 through Spring 1983) program completers, and the placement rate of FY 1983 completers, calculated as the percentage of known completers who obtained jobs. Twenty-three colleges reported that their placement follow-up surveys for Spring 1983 completers had just been disseminated and responses had not yet been received or tabulated. Thus, these colleges' completers were not included in calculating the placement rate.

Several programs listed in Table 1 with Fall 1982 enrollments were initiated that summer or fall and, thus, could not have produced graduates during FY 1983. These new degree programs in Fall 1982 include: one in computer programming, two in word processing, and the program in laser-optics. By Fall 1983, additional colleges initiated degree programs in word processing, biomedical electronics, electrical technology/microprecision, robotics, and computer-aided design (CAD). Tables 2 and 3 show that between Fall 1982 and Fall 1983, colleges added certificate programs in computer operations, data entry, word processing, radiation therapy, metallurgical technology, and CAD. Several colleges are in process of upgrading their keypunch operator certificate programs to full-range data entry programs, since the job market for keypunch operators has been practically eliminated.

Program enrollments have increased substantially in the word processing laser-optics, robotics, and electronic instrumentation degree programs and in the computer operator, word processing, and computer repair certificate programs. Due to accreditation requirements, most allied health programs have limited admissions and, thus, enrollment has remained relatively constant.

The average placement rate is higher for degree than for certificate graduates, and the highest rates are reported for word processing and allied health degree and certificate completers. (While several programs show 100 percent placement, these are all based on reports by a single reporting college in each case and with only two to four completers in a specific program.) The major limitation of this survey is the lack of good placement data, since most follow-up studies are conducted in the spring.

While program enrollment and completion data provide one measure of the scope of community college occupational education, many students enroll in a course or two to retrain or upgrade their occupational skills with no intention of completing a degree or certificate program. In addition, "high technology courses," such as data processing, may be required in a program such as business administration which itself is not "high technology." Table 4 shows the number of semester credit hours provided in FY 1983 in each of the high technology course areas offered by Illinois public community colleges. The number of high technology credit hours produced statewide in FY 1983 represents 17.5 percent of the total number of occupational/vocational credit hours produced by the public community colleges. Nearly 80 percent of the high technology credit hours produced are in the five categories of computer programming, operation, and systems design.

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Table 1

HIGH TECHNOLOGY AAS DEGREE PROGRAMS

Program	Number of Colleges	Fall 1982 Enrollment	FY 1983 Completers a)	FY 1983 Completer Placement Rate b)	Num... Colleges	Fall 1983 Enrollment c)
Computer Programming	45	18,184	1,337	62.4%	45	19,865
Word Processing	8	329	36	84.1%	10	603
Electronics Engineering Technology	31	4,009	556	76.3%	31	4,116
Laser-Optics	1	31	--	--	1	75
Biomedical Electronics/ Equipment Technology	1	18	11	83.3%	2	45
Electrical Technology/ Micro Precision	0	--	--	--	1	3
Robotics/Electro-Mechanical Technology	2	123	19	100.0%	4	204
Electronic Instrumentation Technology	1	183	19	42.1%	1	350
Chemical Technology	5	58	0	--	5	64
Plastics	3	72	10	80.0%	3	64
Non-destructive Testing	1	138	19	--	1	132
Renal Dialysis Technology	1	38	9	--	1	49
Radiation Therapy Technology	1	27	0	--	1	17
Nuclear Medicine Technology	1	64	22	86.4%	1	68
Radiologic Technology	18	990	232	93.2%	18	927
Respiratory Therapy Technology	7	336	101	94.4%	7	354
Business/Office Machine Repair	3	0	1	--	3	13
Communications Equipment Repair	2	12	7	100.0%	2	85
Computer Repair/Servicing-Digital/Microprocessing Technology	4	430	67	--	4	475
Micro-precision Technology	1	29	8	75.0%	1	22
Aviation Maintenance/Electronics	3	180	24	66.7%	3	130
Computer-aided Design	0	--	--	--	1	0
Numerical Control	2	22	2	--	2	25

a) Three colleges did not report completer data (DuPage Main and Open and Highland).
b) Percentage of known placements to known completers only. Twenty-three colleges indicated that their placement surveys were in process but not yet completed. For some programs, the percentage is based on the report of one college only and small numbers of students.
c) For three colleges that did not report Fall 1983 enrollment data (DuPage Main and Open and Harper), Fall 1982 enrollment data was used as an estimate of Fall 1983 enrollment data to provide comparability.

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Table 2

HIGH TECHNOLOGY CERTIFICATE PROGRAMS OF 30 SEMESTER CREDIT HOURS OR MORE

Program	Number of Colleges	Fall 1982 Enrollment	FY 1983 Completers a)	FY 1983 Completer Placement Rate b)	Number of Colleges	Fall 1983 Enrollment c)
Computer Programming	16	1,216	190	54.0%	16	1,288
Computer Operator	9	278	93	70.9%	10	225
Data Entry	1	3	2	100.0%	1	6
Word Processing	19	735	305	54.4%	26	971
Laser-Optics	1	6	0	--	1	6
Chemical Technology	4	4	0	--	4	2
Plastics	1	3	2	100.0%	1	2
Non-destructive Testing	2	2	6	--	2	0
Nuclear Medicine Technology	1	6	5	83.3%	1	5
Radiation Therapy Technology	0	--	--	--	1	0
Telecommunication Outside Plant	1	0	4	75.0%	1	1
Business/Office Machine Repair	3	18	4	--	3	2
Communications Equipment Repair	5	33	5	40.0%	5	28
Computer Repair/Servicing-Digital/Microprocessing Technology	1	0	0	--	1	0
Aviation Maintenance/Electronics	2	0	52	61.5%	2	20
Numerical Control	1	18	8	25.0%	1	13

a) Three colleges did not report completer data (DuPage Main and Open and Highland).
b) Percentage of known placements to known completers only. Twenty-three colleges indicated that their placement surveys were in process but not yet completed. For some programs, the percentage is based on the report of one college only and small numbers of students.
c) For three colleges that did not report Fall 1983 enrollment data (DuPage Main and Open and Harper), Fall 1982 enrollment data was used as an estimate of Fall 1983 enrollment data to provide comparability.

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Table 3

HIGH TECHNOLOGY CERTIFICATE PROGRAMS OF LESS THAN 30 SEMESTER CREDIT HOURS

Program	Number of Colleges	Fall 1982 Enrollment	FY 1983 Completers a)	FY 1983 Completer Placement Rate b)	Number of Colleges	Fall 1983 Enrollment c)
Computer Programming	23	1,346	684	40.9%	23	828
Computer Operator	11	302	76	61.7%	13	463
Data Entry	10	205	44	25.0%	11	179
Word Processing	11	444	101	92.9%	18	559
Robotics/Electro-Mechanical Technology	1	2	6	83.3%	1	0
Electronic Instrumentation Technology	1	0	0	--	1	0
Plastics	2	8	0	--	2	8
Non-destructive Testing	2	2	9	100.0%	2	3
Nuclear Medicine Technology	2	0	0	--	1	0
Radiologic Technology	1	21	0	--	1	21
Metallurgical Technology	0	--	--	--	1	3
Communications Equipment Repair	8	129	31	60.0%	8	78
Computer Repair/Servicing-Digital/Microprocessing Technology	5	26	40	91.3%	5	120
Computer-aided Design	0	--	--	--	1	2
Numerical Control	3	29	0	--	3	52

a) Three colleges did not report completer data (DuPage Main and Open and Highland).
b) Percentage of known placements to known completers only. Twenty-three colleges indicated that their placement surveys were in process but not yet completed. For some programs, the percentage is based on the report of one college only and small numbers of students.
c) For three colleges that did not report Fall 1983 enrollment data (DuPage Main and Open and Harper), Fall 1982 enrollment data was used as an estimate of Fall 1983 enrollment data to provide comparability.

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Table 4

FY 1983 HIGH TECHNOLOGY SEMESTER CREDIT HOURS
PROVIDED BY ILLINOIS PUBLIC COMMUNITY COLLEGES

High Technology Courses	Number of Semester Credit Hours
Computer Programming	144,041
Computer (and Microcomputer) Operation	145,773
Computer Data Entry	8,427
Computer Peripherals	1,824
Computer Systems Design/Analysis	15,564
Computer/Digital Electronics	16,254
Word Processing	27,648
Biomedical Electronics/Equipment	172
Robotics	311
Micro-precision Machining	663
Numerical Control	3,122
Aviation Maintenance/Electronics	3,871
Telecommunications Electronics/Equipment	3,486
Laser-optics	386
Non-destructive Testing/Evaluation	1,105
Chemical Technology	44
Metallurgical Technology	3,728
Plastics Technology	1,156
Renal Dialysis	568
Nuclear Medicine	1,367
Radiologic Technology	10,204
Radiation Therapy	262
Respiratory Therapy	5,702
TOTAL	395,678

Table 5

RECENTLY APPROVED AND PROPOSED FUTURE HIGH TECHNOLOGY PROGRAMS

High Technology Occupational Field	Approved During Fall 1983 Term		Proposed for Implementation through FY 1987	
	Program Level	Number of Colleges	Program Level	Number of Colleges
Robotic/Numerical Control	AAS Degree	1	AAS Degree	9
			Certificate	5
Computer-aided Design	AAS Degree	1	AAS Degree	4
			Certificate	3
Word Processing	AAS Degree	4	AAS Degree	2
	Certificate	1	Certificate	5
Computer Operator	AAS Degree	1	Certificate	1
Telecommunications	Certificate	1	AAS Degree	1
Radiation Therapy	Certificate	1	---	--
Computer Data Entry			Certificate	3
Computer/Microcomputer Servicing			AAS Degree	10
			Certificate	10
Computer Programming/Systems Design			AAS Degree	4
			Certificate	3
Computer-aided Manufacturing			AAS Degree	1
			Certificate	1
Biomedical/Biotechnology			AAS Degree	2
			Certificate	1
Laser-Optics			AAS Degree	1
			Certificate	1
Plastics			Certificate	1

Since classes began in Fall 1983, ten high technology programs have been approved as either new units of instruction or as reasonable and moderate extensions of previously approved units, as indicated in Table 5 on the next page. These programs are not reflected in Tables 1 through 3. Table 5 also shows by field and level the number of colleges proposing to implement various high technology programs within the next four years (through FY 1987).

Conclusions

Illinois community colleges are responding to statewide and community needs for high technology education and training, as is evident in the data presented in this report. Within the past two years, programs have been initiated in robotics, CAD, and other emerging technological fields, and additional programs have been established in word processing and computer programming and operations. Other colleges are proposing to begin programs in this area within the next three years.

Due to the timing of the survey and its short response time, nearly half of the colleges were unable to provide placement data on their FY 1983 completers. Thus, the placement rates reported are, in a number of cases, based on one program with few completers. This lack of complete placement information is the major limitation of the study.

The number of credit hours produced in high technology courses already approaches 20 percent of the total occupational/vocational credit hours produced. While this proportion may increase slightly in the near future, the public community colleges in Illinois also must retain and strengthen their many occupational courses and programs in service-oriented fields, since the majority of jobs in most communities will likely continue to be in these occupations.

ILLINOIS HOUSE OF REPRESENTATIVES RESOLUTION (HR 84)

WHEREAS, The unemployment rate in the State of Illinois is approximately 12.6%, with higher rates for members of many minority groups, and the retraining and reemployment of these unemployed people is a social responsibility to which the General Assembly is deeply committed; and

WHEREAS, The community colleges in the State of Illinois are charged with the responsibility of providing vocational training programs as well as transfer programs, adult education, and community service; and

WHEREAS, Recent studies have identified the field of high technology as one which provides employment opportunities that exceed the number of qualified candidates currently available to fill them; therefore be it

RESOLVED, BY THE HOUSE OF REPRESENTATIVES OF THE EIGHTY-THIRD GENERAL ASSEMBLY OF THE STATE OF ILLINOIS, that the Illinois Community College Board is directed to survey all of the community colleges within its jurisdiction to determine what active steps are being taken at each institution to develop and provide vocational training programs in contemporary and highly technological fields, and to determine the numbers of enrollments, numbers of graduates in these fields, and the current placement rates of graduates at each such institution; and be it further

RESOLVED, that a report of this survey be made to the General Assembly no later than 3 months after the approval of this resolution; and be it further

RESOLVED, that a copy of this preamble and resolution be delivered to the Chairman of the Illinois Community College Board.

HIGH TECHNOLOGY PROGRAMS

Computer Programming

Computer Operator

Computer Data Entry

Computer Peripherals

Computer Repair/Servicing and Digital/Microprocessing Technology

Business/Office Machine Repair

Word Processing

Electronics Engineering Technology

Biomedical Electronics/Equipment Technology

Robotics

Electro-mechanical Technology

Electrical/Microprecision Technology

Electrical Instrumentation Technology

Microprecision Technology

Computer-aided Design

Numerical Control Technology

Aviation Maintenance/Electronics

Communications Equipment Repair

Laser-Optics Technology

Non-destructive Testing/Evaluation

Chemical Technology

Metallurgical Technology

Plastics Technology

Renal Dialysis Technology

Nuclear Medicine Technology

Radiologic Technology

Radiation Therapy

Respiratory Therapy Technician