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ABSTRACT

What is the productivity among institutions of higher learning in the District of Columbia? What programs can possibly be expanded or established to optimize the impact of Federal City College on the residents of D.C.? The approach used aims at taking into account the complex factors related to planning educational services that will be challenging to young and middle-aged workers, while at the same time satisfying the types and levels of skills needed by the various sectors of the economy. Examined are: (1) nondegree program offerings initiated to provide some objective insights about the variety of programs by discipline; (2) trends among graduates of institutions of higher learning in the District; (3) projections for the anticipated manpower needs of government and private industry by specialization for the 1980's for the Washington Metropolitan Labor Market; and (4) trends of growth between manpower supply and demand by areas of training. (Author/KE)

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January 1975

Office of Institutional Research
Federal City College

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Non-Degree Program Offerings to Meet Projected Manpower Needs of the District of Columbia in the 80's

A. Introduction

This paper is intended to assist policymakers at FCC to identify programs that can possibly be expanded or established in order to optimize the impact of the college on the residents of the D.C. community. The approach utilized aimed at taking into account the complex factors related to planning for adequate educational services which should be challenging to young and middle-aged workers, while at the same time satisfying the types and levels of skills needed by the various sectors of the economy. The latest edition of the "Occupational Outlook Handbook, 1974-75" published by the Bureau of Labor Statistics, Department of Labor, also underscored the significance of the study when it pointed out that a substantial portion of the new jobs in the coming years will generally require training and skills at the para-professional and semi-professional levels utilizing mid-level technical skills.

Because of the interdependence of the labor market area components (i.e., manpower needs of employers, availability of trained personnel and occupational interests of students), this study was pursued through four basic tasks.

Task I: A survey of non-degree program offerings was initiated to provide some objective insights on the variety of program offerings by

discipline. Post- secondary programs sponsored by various types of educational institutions in the Washington Metropolitan Area were identified through this endeavor.

Task II: A review of students' occupational interests as reflected in the programs they completed represents the potential source of available manpower. To comprehend the adequacy of this supply (of trained manpower at the para-professional levels), a summary of the trends of graduates produced by institutions of higher learning in the District in recent years was collected and analyzed. Graduates included only those completing associate degrees, diplomas or certificates.

Task III: Projections for the anticipated manpower needs of government and private industry by specialization were produced for the 80's for the Washington Metropolitan Labor Market Area.

Task IV: Review of the trends of growth between manpower supply and demand was done by areas of training. Such an analysis was designed to localize the critical fields of specialization where FCC and other public colleges could mobilize their efforts in the immediate future.

B. Analysis of Information Collected

An awareness of the difficulty of blending predicted manpower needs with the occupational interests and aspirations of trained manpower supply influences the interpretation and analysis of the results emanating from this study. Another critical point in manpower planning that is

often overlooked is the lead time required for training (say, six months to one year), since the supply of trained manpower at the entry level cannot be increased overnight. The possibility of alleviating manpower shortages also implies that personnel who are attracted to disciplines that report a shortage of applicants are readily available and have appropriate aptitudes for training. Other perplexing factors challenging the precision of manpower projections are the proportions of atypical students (which would include not only new secondary school graduates but also college graduates who would re-enroll for retaining in paraprofessional occupations for self-improvement) available for training and the value attached to higher education as not only a preparation for employment but also for effective citizenship, increased consumer participation and the enjoyment of life. An understanding of the complexity and the diversity of American society today could possibly provide some insight as to the number and types of students who would be attracted for retraining at the paraprofessional levels.[1] For instance, factors such as the change in the federal policy concerning equal opportunity to attend post secondary schools; new economic and military relationships with other countries; increase in the length of life resulting from new developments in medical science; increased time for leisure activities and new priorities competing for the same tax dollars, would seem to be equally interdependent and important for manpower estimation purposes.

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[1] C. Robert Haywood, "Two by Four: Associate Programs in Traditionally Four-Year and Graduate Degree Granting Institutions" Journal of Higher Education, XLV, 9, December 1974, p.688.

In fact, the response to persistent problems of the early seventies has provided some impetus to community-oriented technologies such as allied health, environmental and natural resources as well as public service-related training fields. Hence, the availability of short courses and non-degree programs could very well attract students interested in pursuing employment in these areas or in equipping themselves with contemporary knowledge that would enable them to participate actively in a democratic society.[1]

Within the framework of the foregoing issues, this study attempts to assess the extent of productivity among institutions of higher learning in the District. It is reasonable to assume that their output reflects the occupational aspirations and persistence of students. The assessment was also designed to appraise the relevance and impact of this interaction (between the educational institution and the individual) in responding to the manpower demands of the D.C. employers. The following sections were meant to describe this systematic approach.

I. Survey of Non-Degree Program Offerings:

The survey on current training programs was primarily based on the catalogs published by the different institutions of higher learning, public and private agencies in the Washington Metropolitan Area and supplemented by: a) telephone correspondence with program directors

[1]Joseph M. Stetar, "Community Colleges and Educational Needs of Older Adults," Journal of Higher Education XLV, 9, December 1974, p.720.

of the various participating schools; b) "The 1974 Back-To-School Issue and Hidden Resources of Local Universities," Potomac Magazine, The Washington Post, 4 August 1974, and c) The 1974 Yellow Pages of the C & P Telephone Company on "Schools." A perusal of Table 1 which summarizes the number of institutions[1] sponsoring training programs[2] by areas of discipline suggests:

a) Business and Commerce Technologies and the Interdisciplinary Studies appear to be the two areas offered by most of the participating institutions. Public Service-Related Technologies ranked third in popularity among the school offerings. On the other hand, the two fields of training that were rarely offered by institutions were Mechanical and Engineering Technologies and Natural Science Technologies. (Expensive laboratories needed for instruction in these disciplines might have been instrumental in reducing the interest of institutions in offering these courses).

b) Most of the universities concentrate their efforts in such fields as Interdisciplinary Studies, Arts, Health Services and Paramedical Technologies and Public Service - Related Technologies.

c) All of the Junior and Community Colleges provide studies in Business and Commerce while half of them offer the Public Service-Related Technologies.

d) Proprietary schools and the Federal agencies seem to respond to training needs which cut across interagency lines such as Business and Commerce, Data Processing and Interdisciplinary Studies.

e) Collectively, and in keeping with their congressional mandate to serve District residents, D.C. public colleges provide the widest

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[1] The more detailed data are shown as Table A in the appendix. Number of participating institutions by type were: 9 universities; 10 junior and community colleges; 4 Federal agencies; about 80 proprietary schools and the 3 public colleges in D.C.

[2] Limited to programs classified in special programs, continuing education, adult education, institutes, workshops, seminars or conferences where attendance and completion is attested by associate degrees, diplomas or certificates.

Table 1
Number of Institutions Offering Major Areas of Training (AA Degrees, Diplomas, Certificates or Other Awards) by Type of Post-secondary Institutions. Washington Metropolitan Area, 1974 1/

Areas of Training	Type of Institution				
	Universities	Junior & Community Colleges	Proprietary Schools	Federal Agencies	FCC, DCTC & WTI
A. Arts	5	2	5	1	3
B. Business and Commerce Technologies	4	10	34	4	3
C. Data Processing Technologies	1	2	34	4	2
D. Health Services and Paramedical Technologies	5	3	11	1	2
E. Mechanical and Engineering Technologies	4	3	16	2	2
F. Natural Science Technologies	3	2	--	3	2
G. Public Service - Related Technologies	5	5	12	2	3
H. Social Sciences and Humanities	4	2	--	1	3
I. Interdisciplinary Studies	7	2	26	4	3
Total Participating Institutions	9	10	80	4	3

1/ Based on Table A in Appendix.

variety of programs. All colleges offer courses in Arts, Business and Commerce, Public Service-Related Technologies, Social Sciences and Humanities as well as Interdisciplinary Studies.

Table 2 was derived from Table A to further examine the extent of involvement the schools may have in the training of paraprofessionals. This presents the latitude of specialities[1] offered by each type of institution for each type of training area. As a means of objectively measuring the variety of course offerings within each type of institution, proportions of the number of specialties offered by each school category were derived based on the aggregate number of specialties reported for each particular training area. The proportions of specialties marketed by the schools, and presented in Table 2 indicate that:

a) The curricula of the public colleges in the District are concentrated in Arts, Data Processing and in the Mechanical and Engineering Technologies.

b) Training priorities among Proprietary, Federal and Junior Colleges generally gravitate towards Arts and Data Processing, as well as Business and Commerce Technologies. Exceptions to the tendency were the Junior colleges that offered 90% of the specialties in Health and Paramedical Technologies and the Federal agencies that provided as many specialties in Natural Science as they did in Business and Commerce Technologies.

c) Specialties offered by local universities seem to be focused on Health and Paramedical Technologies, Public Service and the Social Sciences.

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[1] For a detailed listing of specialties included under each main area of training, Section II of the HEGIS Taxonomy of Educational Programs in Higher Education is attached as Appendix II.

Table 2

Number and Percent of Specialties Offered in Areas of Training (AA Degrees, Diplomas, Certificates, or Other Awards) by Type of Post-secondary Institution Washington Metrpolitan Area, 1974

Areas of Training	Total Number of Specialities Offered	Type of Institution									
		Universities		Juniors & Community Colleges		Proprietary Schools		Federal Agencies		FCC, DCTC, & WTI	
		No.	%	No.	%	No.	%	No.	%	No.	%
A. Arts	8	6	75.0	8	100.0	4	100.0	8	100.0	7	87.5
B. Business and Commerce Technologies	14	11	78.6	12	85.7	12	85.7	11	78.6	9	64.3
C. Data Processing Technologies	8	1	12.5	4	50.0	7	87.5	7	87.5	6	75.0
D. Health Services and Paramedical Technologies	20	17	85.0	18	90.0	7	35.0	1	5.0	8	40.0
E. Mechanical and Engineering Technologies	18	9	50.0	12	66.7	11	61.1	3	16.7	13	72.2
F. Natural Science Technologies	14	8	57.1	7	50.0	0	0	11	78.6	9	64.3
G. Public Service-Related Technologies	18	15	83.3	12	66.7	2	11.1	10	55.6	11	61.1.
H. Social Sciences and humanities	16	13	81.2	8	50.0	1	6.2	3	18.8	4	25.0
I. Interdisciplinary Studies	10.	8	80.0	2	20.0	2	20.0	7	70.0	4	40.0

1/ Based on Table A which is presented as an appendix.

II. Students' Occupational Interest:

In the absence of statistics on the number of students enrolled in a particular field, a proxy measure of available interest in subject areas concerning mid-level skills had to be used. The trends on the annual student outputs from the local schools of higher learning (i.e. within the District) were assembled by discipline for this purpose. One may assume that these figures represent current aspirations and occupational interests of students for mid-level positions. To reflect contemporary outputs, the aggregate number of graduates for all institutions in the District were used as reported to the annual HEGIS surveys in recent years.

Table 3 shows that the number of graduates certified by the various schools increased from 773 in AY 69-70 to 1,094 in AY 72-73. Growth of student outputs was rapid and consistent in Health and Paramedical Technologies (76%) and in Public Service-related Areas (62%). Table 3 also documents the decline in the number of students completing general programs in arts and sciences (11%), the slow growth of the number of graduates specializing in data processing (10%), as well as the rarity of students majoring in natural science between 1969 to 1971.[1] As a whole, the number of students graduating from 7 major disciplines increased annually by about 12% over the three-year period.

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[1] This may be due to the nonavailability of program offerings at the semi or paraprofessional levels or to the relative newness of programs. It may also be due to market demand, aptitude, degree of difficulty or entry level requirements.

Table 3

Growth Rates of Graduates in Associate Degrees and Other Awards (Requiring at least 1 Year of College) by Areas of Training, Washington, AY 1969-70 Through 1972-73

Areas of Training	Academic Years				Average Annual Rates of Growth
	1969-70	1970-71	1971-72	1972-73	
Arts and Sciences or General Programs	392	236	213	242	-11.3
Business and Commerce	221	354	281	283	8.6
Data Processing	34	48	50	40	10.0
Health and Paramedical	36	86	109	195	76.0
Mechanical and Engineering	29	59	--	58	26.0
Natural Science Technology	--	--	7	15	114.3
Public Service	61	165	234	261	62.0
Total	773	948	894	1,094	12.2

Source: Derived from Table B in Appendix

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III. Government and Industry Educational Needs:

Planning for the anticipated needs of the Federal, District and other local governments is important in that they employ a significant (37%).[1] number of the work force each year. A sample of training directors in Federal and the D.C. public colleges indicated that program offerings and emphasis are basically dependent on requests from agencies; executive orders and new legislation which give new impetus to certain disciplines; and on communications with labor unions, high school principals and community groups.

For purposes of quantifying forecasted demand in the specific mid-level occupations by discipline for the Washington Metropolitan Area labor market, this paper utilized Chidambaram's projections[2] that were based on Arthur D. Little's report on Manpower Directions in Metropolitan Washington, D.C., 1972.[3] Chidambaram's estimates were particularly useful for this purpose because projections were available for the paraprofessional category (i.e., associate degree, dipoloma, or certificate levels) on the same period of interest.[4]

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[1]Bureau of Labor Statistics, Employment and Earnings Report, Volume XXI, Number 7, January 1975, U. S. Department of Labor.

[2]T.S. Chidambaram, "Technical Notes on the Job Market Analysis," Office of Institutional Research, Federal City College, August 1974.

[3]D.C. Manpower Administration and U.S. Department of Labor, Manpower Directions in Metropolitan Washington, D.C., 1972, Table 6, Chapter III, p. 17.

[4]Occupational demand estimates were reclassified to parallel the specialties offered in each area of training (i.e., mechanical and engineering technologies include draftsmen, surveyors etc.) and the proportions allocated at the paraprofessional levels were based on the ratio of BA to AA earned degrees reported by the Office of Education in 1969-70.

Table 4 presents the projected volume of manpower needs between 1974 and 1980 in the Washington Metropolitan Area. The data suggest that the contemplated annual growth for the incoming years will be basically in Data Processing Technologies (16%) and in Health and Para-medical areas (7%) while Technical and Engineering careers trailed the rates of expected growth. The increase in the demand for all types of services at this level of training is about 4% annually for a six-year period.

IV. Comparison of Growth Between Manpower Demand and Supply to Anticipate Training Needs:

An attempt was undertaken to crystallize the extent of training responsibility that will have to be provided by the D.C. institutions of higher learning to respond to the ever-increasing demand for mid-level skills. This was done by comparing the number of graduates with the forecasted demand in the 80's on each area of training.

Table 5 presents the educational output (supply) from schools in the District by discipline as well as the estimated occupational demand for the District in 1974 and in 1980.

Information provided in Table 5 suggests that the:

a) District schools appear to be grossly deficient in providing trained paraprofessionals in Mechanical and Engineering Technologies. Hence, the annual rate of growth expected in this field in the near future should be in the order of 60% annually to relieve the market pressure in this area.

Table 4

Forecast of Occupational Demand by Areas of Training, Washington Metropolitan Area, 1974 and 1980

Areas of Training	Years		Annual Rates of Growth
	1974	1980	
Business and Commerce	10,425	12,968	3.7
Data Processing	602	1,471	16.1
Health and Paramedical	2,218	3,406	7.4
Mechanical and Engineering	5,464	6,404	2.7
Other Specialities (Natural Science, Public Services, and General Programs in Arts and Sciences)	3,850	5,009	4.5
Total	22,559	29,258	4.4

1/ Refers only to computer programming.

Source: T.S. Chidambaram, "Technical Notes on the Job Market Analysis", Chart 3 - Forecasted Growth Rates of Occupational Demand for 2-year Programs by Major Discipline Groups, Office of Institutional Research, Aug. 1974.

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Table 5

Distribution of Graduates Compared to the Forecasted Demand by Areas of Training, District of Columbia 1/, 1973, 1974, and 1980

Areas of Training	Graduates 1973	Forecasted Demand[2] 1974	1980	Expected Annual Rates of Growth Among Graduates (1973-74)	(1973-80)	Rank of Growth
Business and Commerce	283	2,606	3,112	821	40	2
Data Processing	40	150	353	275	36	3
Health and Paramedical	195	554	817	184	23	4
Mechanical and Engineering	58	1,366	1,537	2,255	60	1
Other Specialties (Natural Science, Public Services, Arts, and Social Sciences)	518	962	1,202	86	12	5
Total	1,094	5,638	7,021	415	31	-

1/ Based on Tables 3 and 4.

2/ D.C. occupational demand was estimated by assuming that the District's share of the WSMSA forecasted demand shown in Table 4 will be proportionately equal to the ratio of D.C. residents to the total residents of the WSMSA. For FY'74, the ratio of 25% was utilized as based on the population estimates of the Current Population Report. Bureau of Census, 1973, P25-505, p.21. In view of the fact that the maximum capacity of the District seem to have been attained, its consistent population decline is assumed to persist; hence a ratio of 24% was assumed for 1980.

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b). Specialties ranking as second and third in expected growth for trained mid-level skills are Business and Commerce and Data Processing Technologies, respectively.

c) Health and Paramedical Technologies appeared to require moderate expansion to cope with the demand while "other specialties" such as Natural Sciences, Public-Related Services, Arts and Social Sciences seem to claim the lowest growth.

As a whole, Table 5 reveals that the educational output of District schools should be trebled to cope with the increasing demand of mid-level skills in the D.C. area alone.

These figures were also laid out in Chart A for purposes of depicting the comparative relationships among the various specialties in the coming years. This chart emphasizes a great need for accelerating the number of graduates in Business and Commerce from the fourth to the largest group and the Mechanical and Engineering group from second to the lowest to the second largest set. Furthermore, Chart A also manifests the finding that although the growth of graduates expected in Data Processing should be gradual and consistent, this set maintains its position as being the smallest group.

C. Conclusions and Recommendations

Irrespective of whether the projected occupational needs will have to be met through: a) the production of newly qualified and academically trained personnel or, b) through shifting employees or providing on-the-job training, the study revealed the necessity for FCC and other public

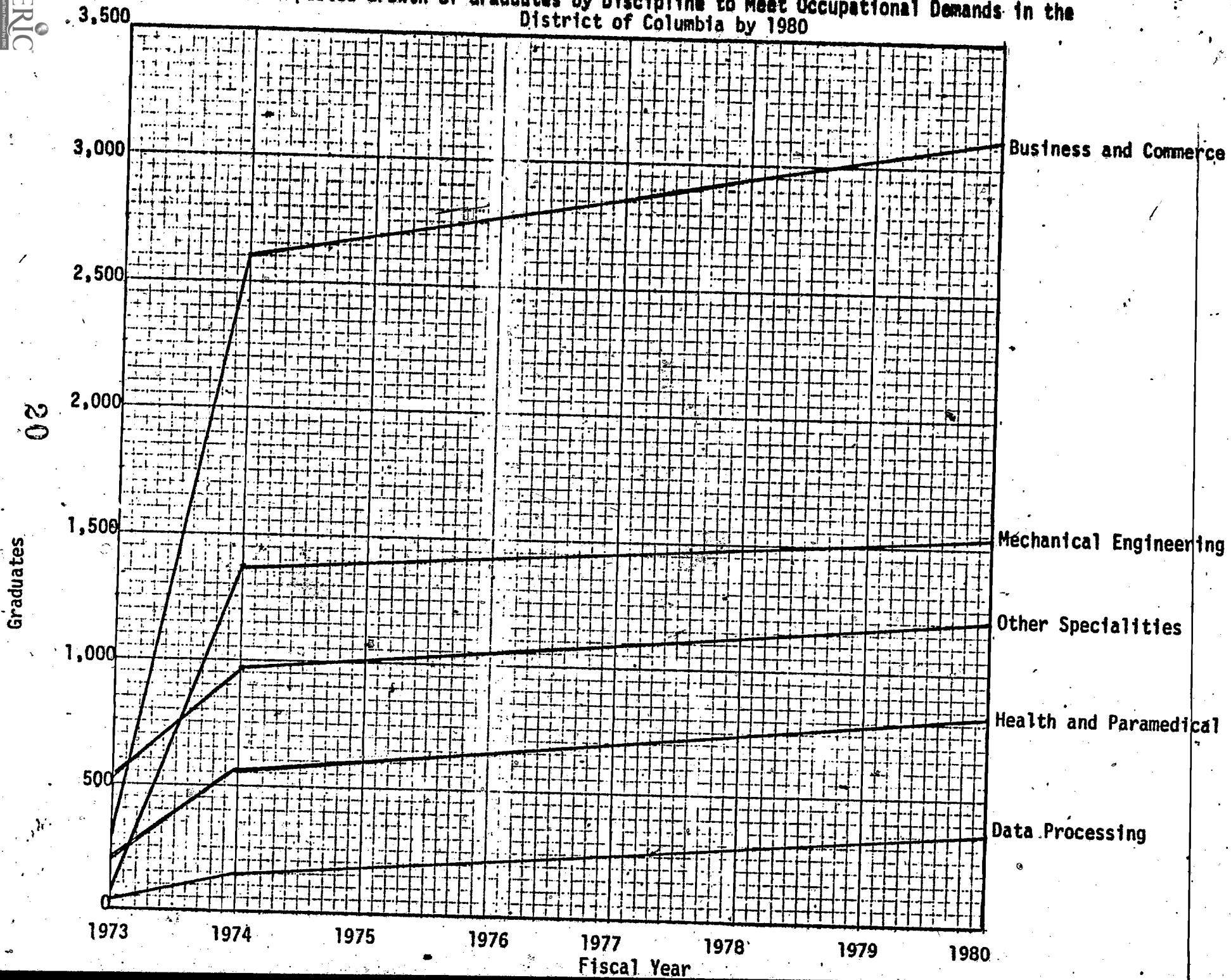
Chart A: Expected Growth of Graduates by Discipline to Meet Occupational Demands in the District of Columbia by 1980
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Graduates
1973
1974
1975
1976
1977
1978
1979
1980
Fiscal Year
Business and Commerce
Mechanical Engineering
Other Specialities
Health and Paramedical
Data Processing

colleges in the District to consider the possibility of expanding and establishing special programs in the areas specified below.

Since the supply of graduates trained in Mechanical and Engineering and Business and Commerce Techonoligies appears to be insufficient to respond to the estimated needs in the 80's, and considering the type of academic resources currently available at FCC and the other public colleges, it is highly expedient for them to expand or establish new program offerings through short-term courses. It should be emphasized, however, that these institutes or workshops should be tailored to the skill levels and training requirements of local government and industry. Nevertheless, it should be mentioned that fulfillment of these plans is highly dependent on the availability of local residents who may be interested (or will develop a liking) in pursuing these occupational fields. While it is true that the D.C. public colleges offer the widest range of specialties in Mechanical and Engineering Technologies, it might also be useful to consider introducing specialties that would complement those that are already being offered by junior colleges[1] in this field. For example, D.C. public colleges may examine the feasibility of offering short courses in engineering technologies such as chemical, diesel, instrumentation, nuclear and automation.

In the area of Business and Commerce, a reinforcement of current program offerings among public colleges in D.C. is warranted since this group

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[1]See Table B in appendix.

offered a limited variety of specialties in this discipline when compared to the other types of educational institutions.

Local universities and junior colleges appear to have the training resources to handle the gradual but consistent need for more trained personnel in Health and Paramedical Technologies. Thus, it can safely be assumed that the demand for D.C. public colleges to offer training in this area would be quite low.

Among Data Processing Technologies, FCC and the other public institutions, local proprietary schools and federal agencies need only to expand their services to accommodate more students and, hence, produce an increased number of graduates to satisfy the market demand.

"Other specialties" where the District public colleges are already making an impact are in Natural Science Technologies and the Public Service-Related Areas. The short courses that will have to be designed on unexplored aspects should complement those that are currently offered by federal agencies in natural sciences and by local universities in public service - related areas.

Programs that should be maintained at the current levels of emphasis at FCC because of the variety of training areas in other educational institutions or the indirect relationship of these disciplines to specific occupational targets in the government and private sectors are: arts, social sciences and humanities, and interdisciplinary studies.

In the planning of curricula for special institutes, seminars and workshops, it is suggested that some input information from local residents through sample surveys should be obtained. Survey results could serve as guidelines in determining priorities of program offerings and sequencing of courses within particular fields.

Appendix I - Table A

Table B

Table A

Number of Institutions in Areas of Training (AA, Diplomas, Certificates or Other Awards) by Type of Post-secondary Institutions, Washington Metropolitan Area, 1974

Areas of Training	Type of Institution[a]				
	Universities	Junior and Community Colleges	Proprietary Schools	Federal Agencies	FCC, DCTC & WTI
A. Arts					
Art Curriculum	-	2	5	1	3
Arts and Crafts	3	2	1	1	-
Arts and Science (General)	5	2	-	3	3
Art History	3	2	1	1	2
Industrial Arts	-	2	-	1	2
Interior Decoration	1	1	5	1	1
Music	4	1	-	1	1
Theater Arts	3	1	-	1	1
B. Business and Commerce Technologies					
Business and Commerce Technologies, General	3	1	2	1	1
Accounting Technologies	3	4	6	2	1
Banking and Finance Technologies	3	1		2	1
Marketing, Distribution, Purchasing, Business, and Industrial Management Technologies	4	5	8	4	2

Table A (Continued)

Number of Institutions in Areas of Training (AA, Diplomas, Certificates or Other Awards) by Type of Post-secondary Institutions, Washington Metropolitan Area, 1974

Areas of Training	Type of Institution[a]				
	Universities	Junior and Community Colleges	Proprietary Schools	Federal Agencies	FCC, DCTC & WTI
B. Business and Commerce (Cont'd)					
Secretarial Technologies (include office machine training)	3	10	22	3	3
Personal Service Technologies (stewardess, cosmetologist, etc.)	-	-	34	-	-
Photography Technologies	3	2	2	3	1
Communications and Broadcasting Technologies (radio/television, newspapers)	3	2	7	2	2
Printing and Lithography Technologies	1	1	-		1
Hotel and Restaurant Management Technologies	-	1	4		
Applied Arts, Graphic Arts, and Fine Arts Technologies (include advertising design)	3	8	1	3	2
Crafts	-	-	15	2	-
Real Estate	3	1	6	-	-
Dramatics and Speech	2	2	9	1	-
C. Data Processing Technologies					
Data Processing Technologies, General	-	2	34	1	2
Key Punch Operator and Other Input Preparation Technologies	-	-	9	1	1
Computer Programmer Technologies	-	1	7	2	2

Table A (Continued)

Number of Institutions in Areas of Training (AA, Diplomas, Certificates or Other Awards) by Type of Post-secondary Institutions, Washington Metropolitan Area, 1974

Areas of Training	Type of Institution[a]				
	Universities	Junior and Community Colleges	Proprietary Schools	Federal Agencies	FCC, DCTC & WTI
C. Data Processing (Cont'd)					
Computer Operator and Peripheral Equipment Operation Technologies	-	1	2	3	2
Data Processing Equipment Maintenance Technologies	-	-	2	-	-
Data Processing Management	-	1	3	3	2
Computer Systems	1	-	1	4	2
ADP User Education	-	-	-	1	-
D. Health Services and Paramedical Technologies					
Health Services Assistant Technologies, General	2	2	11	-	-
Dental Assistant Technologies	1	3	3	-	-
Dental Hygiene Technologies	3	1		-	-
Dental Laboratory Technologies	1	1	1	-	-
Medical or Biological Laboratory Assistant Technologies	1	3	1	-	1
Radiologic Technologies (X-ray, etc.)	3	2	-	-	1
Nursing, Practical (L.P.N. or L.V.N.-less than 4-year program)	5	3	1	-	1
Occupational Therapy Technologies	1	1	-	-	-

Table A (Continued)

Number of Institutions in Areas of Training (AA, Diplomas, Certificates or Other Awards) by Type of Post-secondary Institutions, Washington Metropolitan Area, 1974

Areas of Training	Type of Institution[a]				
	Universities	Junior and Community Colleges	Proprietary Schools	Federal Agencies	FCC, DCTC & WTI
D. Health Services (Cont'd)					
Optical Technologies (include Ocular Care, Ophthalmic, Optometric Technologies)	2	-	-	-	-
Medical Record Technologies	-	1	-	-	-
Medical Assistant and Medical Office Assistant Technologies	1	2	-	-	1
Inhalation Therapy Technologies	1	1	-	-	1
Psychiatric Technologies (include mental health aide programs)	2	2	-	-	2
Electro Diagnostic Technologies (include E.K.G., E.E.G., etc.)	1	-	-	-	-
Institutional Management Technologies (rest home, etc.)	3	2	-	-	1
Physical Therapy Technologies	1	2	-	-	-
Treatment of Alcoholics	2	1	-	-	-
Pharmacology	3	1	-	-	-
Occupational Safety and Health	-	1	-	1	-
Mortuary Science	-	1	1	-	1
E. Mechanical and Engineering Technologies					
Mechanical and Engineering Technologies, General	2	-	2	-	1
Aeronautical and Aviation Technologies	-	1	16	-	1
Engineering Graphics (tool and machine drafting and design)	-	2	3	2	2

Table A (Continued)

Number of Institutions in Areas of Training (AA, Diplomas, Certificates or Other Awards) by Type of Post-secondary Institutions, Washington Metropolitan Area, 1974

Areas of Training	Type of Institution[a]				
	Universities	Junior and Community Colleges	Proprietary Schools	Federal Agencies	FCC, DCTC & WTI
E. Engineering (Cont'd)					
Architectural Drafting Technologies	2	2	5	-	1
Chemical Technologies (include plastics)	-	-	-	-	1
Automotive Technologies	-	3	6	-	-
Diesel Technologies			2		
Welding Technologies		1	-		
Civil Technologies (surveying photogrammetry, etc.)	4	2	-	1	1
Electronics and Machine Technologies (television appliance, office machine repair, etc.)	1	2	8	-	1
Electromechanical Technologies		2			
Industrial Technologies	1	1	3	1	2
Instrumentation Technologies			-	-	1
Mechanical Technologies	1	2	3	-	1
Nuclear Technologies	1				1
Construction and Building Technologies (carpentry, electrical work, plumbing, sheetmetal air conditioning, heating, etc.)	1	1	8	-	1
Automation Management					
Urban Planning	1	1	1	-	2
			-	-	

Table A (Continued)

Number of Institutions in Areas of Training (AA, Diplomas, Certificates or Other Awards) by Type of Post-secondary Institutions, Washington Metropolitan Area, 1974

Areas of Training	Type of Institution[a]				
	Universities	Junior and Community Colleges	Proprietary Schools	Federal Agencies	FCC, DCTC & WTI
F. Natural Science Technologies					
Natural Science Technologies, General	1	1	-	1	1
Agriculture Technologies (include horticulture)	-	1	-	2	a
Forestry and Wildlife Technologies (include fisheries)	-	-	-	2	1
Food Services Technologies	1	2	-	1	-
Home Economics Technologies	1	1	-	1	2
Marine and Oceanographic Technologies	3	-	-	1	1
Sanitation and Public Health Inspection Technologies (environmental health technologies)	3	-	-	3	2
Biology Technologies	-	-	-	-	2
Science Technologies	-	1	-	1	
Food Science Technologies	-	-	-	-	2
Cartography, Geography	-	1	-	1	1
Physical Science	1	-	-	-	1
Astrology & Astronomy	1	1	-	1	-
Archeology	1	-	-	1	-

Table A (Continued)

Number of Institutions in Areas of Training (AA, Diplomas, Certificates or Other Awards) by Type of Post-secondary Institutions, Washington Metropolitan Area, 1974

Areas of Training	Type of Institution[a]				
	Universities	Junior and Community Colleges	Proprietary Schools	Federal Agencies	FCC, DCTC & WTI
G. Public Service Related Technologies					
Public Service Technologies, General	-	1	-	1	1
Bible Study of Religion Related Occupations	2	1	12	1	-
Education Technologies (teacher aide and 2-year teacher training program)	5	6	-	-	3
Library Assistant Technologies	2			2	1
Police, Law Enforcement, Corrections Technologies	3	3	1	2	2
Recreation and Social Work Related Technologies	1	2	-	-	2
Fire Control Technology	-	3	-	-	1
Public Administration and Management Technologies	1	2	-	-	3
Health, Physical Education	3	2	-	-	3
Law for the Layman	2	1		1	
Legal Aspects of Civil Rights	1			1	
Community Development	2	1	-	1	2
Labor Relations and Personnel Management	2	1	-	2	2
Consumer Education	2	-	-		

Table A (Continued)

Number of Institutions in Areas of Training (AA, Diplomas, Certificates or Other Awards) by Type of Post-secondary Institutions, Washington Metropolitan Area, 1974

Areas of Training	Type of Institution[a]				
	Universities	Junior and Community Colleges	Proprietary Schools	Federal Agencies	FCC, DCTC & WTI
G. Public Service (Cont'd)					
Key Issues of Today	3	1	-	2	-
Legal Assistant	2	-	-	-	-
Retirement Planning	-	-	-	2	-
Military Science	1	-	-	-	1
H. Social Sciences and Humanities					
Academic Review (CLEP Natural Science, Social Science, Engineering)	3	-	5	1	3
Business Law	-	1	-	-	1
Education:					
Curriculum and Instruction	1	-	-	-	-
Elementary Education	2	2	-	-	2
Secondary Education	-	1	-	-	-
Geographic Film Lectures	1	-	-	-	-
Guidance and Counseling	2	-	-	-	-
Industrial Education	-	1	-	-	-
Inter-Dimensional Education	3	1	-	-	-
International Affairs	1	1	-	1	-
Journalism	4	2	-	-	-
Literature and Poetry	4	1	-	-	1
Philosophy	2	-	-	1	-
Psychology Today	1	-	-	-	-
Social Foundations	1	-	-	-	1
Sociology and Anthropology	1	-	-	-	-

[a] Type of Institution

Table A (Continued)

Number of Institutions in Areas of Training (AA, Diplomas, Certificates or Other Awards) by Type of Post-secondary Institutions, Washington Metropolitan Area, 1974

Areas of Training	Type of Institution[a]				
	Universities	Junior and Community Colleges	Proprietary Schools	Federal Agencies	FCC, DCTC & WTI
I. Interdisciplinary Studies					
Management Information Systems	2	–	–	1	1
Policy Formulation and Implementation	1	–	–	3	–
Planning Leadership	1	–	–	2	–
Research and Development	1	–	–	1	1
Special Topics for Women	5	2	–	1	–
Procurement and Grants Management	1	–	–	1	–
Court and Conference Reporting	–	–	3	–	–
Basic Communication Skills	7	2	26	5	3
Philosophy	1	–	–	–	1
Public Relations					

[a] Participating institutions: 9 universities; 10 junior and community colleges; 4 Federal agencies; about 80 proprietary schools and 3 D.C. public colleges.

Table B

Distribution of Graduates in Associate Degrees and Awards Requiring at Least a Year in College by Discipline, Washington, D.C., AY 1969-70 Through 1972-73

Occupational Discipline	Academic Years 1969-70	1970-71	1971-72	1972-73
A. ARTS AND SCIENCE OR GENERAL PROGRAMS	392	236	213	242
B. BUSINESS AND COMMERCE TECHNOLOGIES				
Business and Commerce Technologies, General	106	52	44	57
Accounting Technologies	25	93	68	43
Banking and Finance Technologies	-	34	1	-
Marketing, Distribution, Purchasing, Business, and Industrial Management Technologies	7	45	24	51
Secretarial Technologies (include office machines training)	40	87	59	54
Communications and Broadcasting Technologies (radio/television, newspapers)	-	7	-	-
Printing and Lithography Technologies	9	-	16	13
Applied Arts, Graphic Arts, and Fine Arts Technologies (include advertising design)	-	11	8	14
Interpretation and Translation	34	25	61	51
Total	221	354	281	283

Table B (Continued)

Distribution of Graduates in Associate Degrees and Awards Requiring at Least a Year in College by Discipline, Washington, D.C., AY 1969-70 Through 1972-73

Occupational Discipline	Academic Years 1969-70	1970-71	1971-72	1972-73
C. DATA PROCESSING TECHNOLOGIES				
Data Processing Technologies, General	34	-	-	-
Computer Programmer Technologies	-	42	40	28
Computer Operator and Peripheral Equipment Operation Technologies	-	6	10	12
Total	34	48	50	40
D. HEALTH SERVICES AND PARAMEDICAL TECHNOLOGIES				
Health Services Assistant Technologies, General	13	3	-	-
Dental Hygiene Technologies	-	12	16	17
Medical or Biological Laboratory Assistant Technologies	-	7	-	21
Radiologic Technologies (X-ray, etc.)	-	7	16	36
Nursing, R.N. (less than 4-year program)	23	52	45	56
Nursing, Practical (L.P.N. or L.V.N. - less than 4-year program)	-	-	-	35
Optical Technologies (include ocular care, ophthalmic, optometric technologies)	-	-	3	5
Medical Assistant and Medical Office Assistant Technologies	-	-	11	-
Inhalation Therapy Technologies	-	5	18	17
Psychiatric Technologies (include mental health aide programs)	-	-	-	8
Total	36	86	109	195

Table 8 (Continued)

Distribution of Graduates in Associate Degrees and Awards Requiring at Least a Year in College by Discipline, Washington, D.C., AY 1969-70 Through 1972-73

Occupational Discipline	Academic Years 1969-70	1970-71	1971-72	1972-73
E. MECHANICAL AND ENGINNEERING TECHNOLOGIES				
Mechanical and Engineering Technologies, General	-	-	-	6
Aeronautical and Aviation Technologies	-	14	-	6
Engineering Graphics (tool and machine drafting and design)	8	-	-	-
Architectural Drafting Technologies	-	11	-	9
Chemical Technologies (include plastics)	-	3	-	4
Civil Technologies (surveying photogrammetry, etc.)	5	4	-	4
Electronics and Machine Technologies (television appliance, office machine repair, etc.)	12	20	-	12
Electromechanical Technologies	-	5	-	12
Mechanical Technologies	-	-	-	5
Nuclear Technologies	4	-	-	-
Urban Planning	-	2	-	-
Total	29	59	-	58
F. NATURAL SCIENCE TECHNOLOGIES				
Home Economic Technologies	-	-	-	12
Marine and Oceanographic Technologies	-	-	-	2
Sanitation and Public Health Inspection Technologies (environmental health technologies)	-	-	7	1
Total	-	-	7	15

Table B (Continued)

Distribution of Graduates[a] in Associate Degrees and Awards Requiring at Least a Year in College by Discipline, Washington, D.C., AY 1969-70 Through 1972-73

Occupational Discipline	Academic Years 1969-70	1970-71	1971-72	1972-73
G. PUBLIC SERVICE RELATED TECHNOLOGIES				
Public Service Technologies, General	-	-	14	-
Education Technologies (teacher aide and 2-year teacher training program)	9	84	53	22
Library Assistant Technologies	-	-	23	-
Police, Law Enforcement, Corrections Technologies	33	54	84	150
Recreation and Social Work Related Technologies	6	26	33	31
Fire Control Technology	-	-	10	10
Public Administration and Management Technologies	-	1	3	1
Social Welfare	13	-	-	-
Drug Program Management	-	-	-	36
Special Education	-	-	-	6
Court and Conference Reporting	-	-	-	5
Comprehensives	-	-	14	-
Total	61	165	234	261
Grand Total	773	948	894	1,094

[a]Participating Institutions: American University, Georgetown University, George Washington University, Howard University, Immaculata College, Mt. Vernon College, Southeastern University, Strayer College, Webster College, FCC and WTI.

SOURCE: HEGIS Data, D.C. Academic Facilities Commission, AY 1969-70 to 1972-73.

Appendix II – Technological and Occupational Curriculums Leading to Associate Degrees and Other Awards Below the Baccalaureate

5000 BUSINESS and COMMERCE TECHNOLOGIES

Subject field designations which characterize students, faculty, facilities, degree and certificate programs, etc. specifically associated with development of skills required for commercial, business, or secretarial occupations at the semiprofessional level. Two years of preparation beyond high school are usually sufficient for entrance into these occupational fields.

5001 Business and commerce technologies, general
5002 Accounting technologies
5003 Banking and finance technologies
5004 Marketing, distribution, purchasing, business, and industrial management technologies
5005 Secretarial technologies (include office machines training)
5006 Personal service technologies (stewardess, cosmetologist, etc.)
5007 Photography technologies
5008 Communications and broadcasting technologies (radio/television, newspapers)
5009 Printing and lithography technologies
5010 Hotel and restaurant management technologies
5011 Transportation and public utility technologies
5012 Applied arts, graphic arts, and fine arts technologies (include advertising design)
5099 Other, specify

5100 DATA PROCESSING TECHNOLOGIES

Subject field designations which characterize students, faculty, facilities, degree and certificate programs, etc. specifically associated with development of skills required for data processing or related occupations at the

semiprofessional level. Two years of preparation beyond high school are usually sufficient for entrance into these occupational fields.

- 5101 Data processing technologies, general
- 5102 Key punch operator and other input preparation technologies
- 5103 Computer programmer technologies
- 5104 Computer operator and peripheral equipment operation technologies
- 5105 Data processing equipment maintenance technologies
- 5199 Other, specify

5200 HEALTH SERVICES and PARAMEDICAL TECHNOLOGIES

Subject field designations which characterize students, faculty, facilities, degree and certificate programs, etc. specifically associated with development of skills required for health service related occupations at the semiprofessional level. Two years of preparation beyond high school are usually sufficient for entrance into these occupational fields.

- 5201 Health services assistant technologies, general
- 5202 Dental assistant technologies
- 5203 Dental hygiene technologies
- 5204 Dental laboratory technologies
- 5205 Medical or biological laboratory assistant technologies
- 5206 Animal laboratory assistant technologies
- 5207 Radiologic technologies (X-ray, etc.)
- 5208 Nursing, R.N. (less than 4-year program)
- 5209 Nursing, practical (L.P.N. or L.V.N.—less than 4-year program)
- 5210 Occupational therapy technologies
- 5211 Surgical technologies
- 5212 Optical technologies (include ocular care, ophthalmic, optometric technologies)
- 5213 Medical record technologies
- 5214 Medical assistant and medical office assistant technologies
- 5215 Inhalation therapy technologies
- 5216 Psychiatric technologies (include mental health aide programs)
- 5217 Electro diagnostic technologies (include E.K.G., E.E.G., etc.)
- 5218 Institutional management technologies (rest home, etc.)
- 5219 Physical therapy technologies
- 5299 Other, specify

5300 MECHANICAL and ENGINEERING TECHNOLOGIES

Subject field designations which characterize students, faculty, facilities, degree and certificate programs, etc. specifically associated with development of skills required for mechanical and engineering related occupations at the semiprofessional level. Two years of preparation beyond high school are usually sufficient for entrance into these occupational fields.

- 5301 Mechanical and engineering technologies, general
- 5302 Aeronautical and aviation technologies
- 5303 Engineering graphics (tool and machine drafting and design)
- 5304 Architectural drafting technologies
- 5305 Chemical technologies (include plastics)
- 5306 Automotive technologies
- 5307 Diesel technologies
- 5308 Welding technologies
- 5309 Civil technologies (surveying, photogrammetry, etc.)
- 5310 Electronics and machine technologies (television, appliance, office machine repair, etc.)
- 5311 Electromechanical technologies
- 5312 Industrial technologies
- 5313 Textile technologies
- 5314 Instrumentation technologies
- 5315 Mechanical technologies
- 5316 Nuclear technologies
- 5317 Construction and building technologies (carpentry, electrical work, plumbing, sheet metal, air conditioning, heating, etc.)
- 5399 Other, specify

5400 NATURAL SCIENCE TECHNOLOGIES

Subject field designations which characterize students, faculty, facilities, degree and certificate programs, etc. specifically associated with development of skills required for natural science related occupations at the semiprofessional level. Two years of preparation beyond high school are usually sufficient for entrance into these occupational fields.

- 5401 Natural science technologies, general
- 5402 Agriculture technologies (include horticulture)
- 5403 Forestry and wildlife technologies (include fisheries)
- 5404 Food services technologies
- 5405 Home economics technologies
- 5406 Marine and oceanographic technologies
- 5407 Laboratory technologies, general
- 5408 Sanitation and public health inspection technologies (environmental health technologies)
- 5499 Other, specify

5500 PUBLIC SERVICE RELATED TECHNOLOGIES

Subject field designations which characterize students, faculty, facilities, degree and certificate programs etc. specifically associated with development of skills required for public service related occupations at the semiprofessional level. Two years of preparation beyond high school are usually sufficient for entrance into these occupational fields.

- 5501 Public service technologies, general
- 5502 Bible study or religion-related occupations
- 5503 Education technologies (teacher aide and 2-year teacher training programs)
- 5504 Library assistant technologies
- 5505 Police, law enforcement, corrections technologies
- 5506 Recreation and social work related technologies
- 5507 Fire control technology
- 5508 Public administration and management technologies
- 5599 Other, specify

Source: Excerpted from A Taxonomy of Instructional Programs in Higher Education, National Center for Educational Statistics, U.S. Office of Education.

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