THE VALIDITY OF THE PROGRAMMER APTITUDE TEST AS A PREDICTOR OF SUCCESS IN SELECTED OKLAHOMA AREA VOCATIONAL-TECHNICAL SCHOOLS' DATA PROCESSING PROGRAMS

By

LORIN GEORGE VOGEDING, SR.

Bachelor of Arts

Westminster College

Fulton, Missouri

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Thesis Approved:

O S Bladd
Thesis Adviser

Lloyd Wiggins

Eric W. Dugger

N Durham
Dean of the Graduate College

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CHAPTER I

INTRODUCTION

The use of computers in business began in 1954 when the first commercial computer was installed in a business environment. A rapid growth of the use of computers by business has taken place since that time. During the middle part of the 1960's, the number of people who dealt with computers increased greatly. By 1968 there were about 300,000 systems analysts and programmers working with computers. According to the Manpower Report of the President, 1970, these jobs will increase in number from that 1968 level by a factor of 200 to 300 percent by 1980.[1] If these figures are true, a tremendous training program will be required both on the part of industry and educational organizations.

During the early days of computers, some people feared that the computer would put large numbers of people out of work. The opposite has happened. The computer industry has created large numbers of jobs using skills and having job titles that were unheard of in the 1940's.

The computer industry is rapidly expanding, and the need for trained people has become important to its continued expansion. Personnel already in the industry must constantly be retrained to meet the advances of technology that have taken place since their original training.

Background

The state of Oklahoma has developed, through the State Department of Vocational and Technical Education, a shared computer system in an effort to meet some of these training needs.[2] The state computer system was designed to supply the hardware needs of institutions sharing the system. The system is composed of ten satellite computers that are connected by telephone lines to a central computer in the data processing center in Oklahoma City. The center is shared jointly by the State Department of Vocational and Technical Education and the State Department of Education. The hardware needs of the institutions sharing the system have been met.

Hardware, however, is only part of the educational needs. The problems of curriculum, adequate texts, and high student costs remain, and data processing educators must solve them.

The problem of student selection has become one of the most pressing encountered by educators using this shared system. In programs that have high training costs, i.e. computer programs, student selection becomes very important. The cost per graduate is the figure for which educators are held accountable. If the dropout rate is high, the cost per graduate spirals rapidly. With proper screening techniques, the number of dropouts should be reduced, thereby lowering the cost per graduate.

One test that could be used for selection purposes by schools sharing the state system is the Programmer Aptitude Test (PAT). This test was developed by the IBM Corporation (IBM) for the selection of prospective programmers and has been used for this purpose by IBM and its customers for many years. This test has been accepted as an

industrial standard for the selection of data processing personnel. Some educators feel that this test could be used as a selection criterion for prospective students enrolling in programs at schools using the state system.

Statement of the Problem

Development of a criterion for student selection in the computer area is urgently needed. Computer programs are very expensive to operate and a dropout rate which may be excessive is being experienced in existing programs throughout the state. Proper student selection may reduce the attrition rate, thereby reducing the training cost per graduate.

The Programmer Aptitude Test may be the answer to a selection criterion for screening prospective students who apply for training at area vocational-technical schools.

Questions to be Answered

Question 1. Is there a correlation between the score on the Programmer Aptitude Test and students' achievement (as measured by grade) at the end of the first semester or period of study that can be used to predict success?

Question 2. Is there a variation in correlation between the results on the Programmer Aptitude Test and student achievement (as compared by grade) between high school, post high school, and adult students?

Limitations

As this study was made, several problems became apparent. The limiting factors are as follows:

1. No consideration in the study design has been made for the different educational levels of the students involved in the study.

2. No differentiation was made for the chronological age of the students.

3. No consideration was given to the different methods of teaching or grading.

Definition of Terms

Adult Student - For the purpose of this study, a person who attends a night course.

Aptitude Test - A test given to determine the presence of abilities necessary for success in the tested area.

Computer - An electronic device that is capable of doing high speed calculations, has internal memory, internal programming, and fast input-output devices. Input is the process of getting data into the computer and output is the process of getting data out of the computer.

Data Processing - The act of processing data. A computer may be involved in this process.

First Commercial Computer - Univac I, was installed at General Electric's Appliance Part in Louisville, Kentucky, in 1954 and is considered to be the first commercial computer.

Hardware - The physical parts of the computer.

High School Student - Any student in a day school program who has not passed the 12th grade.

O. T. Autry Area Vocational-Technical School - Located at Enid, is hereafter referred to as O. T. Autry in this study.

Oklahoma City Area Vocational-Technical School - Located in Oklahoma City, is hereafter referred to as Oklahoma City in this study.

Post High School Student - Any student who has completed high school or its equivalent and is enrolled in a day program.

Programmer Aptitude Test - A test devised by IBM Corporation for the selection of beginning computer programmers.

Satellite Computer - A computer located at a site different from the central location in a shared system.

Shared Computer System - A computer in a central location that is shared by several users in such a manner that each user operates independently of the other users.

Tri-County Area Vocational-Technical School - Located in Bartlesville, is hereafter referred to as Tri-County Tech.

FOOTNOTES

[1]United States Department of Labor, Manpower Report of the President (Washington, 1970), p. 162.

[2]Francis Tuttle, "Phase One of the Summer Institute to Train Data Processing Teachers for the New Oklahoma Statewide Computer Science System" (Stillwater, 1966), p. 162.

CHAPTER II

REVIEW OF RELATED LITERATURE

An aptitude test is one used to predict success in some occupation or training course. In form, these tests are not distinctly different from other types of tests. The test is referred to as an achievement test when it is used to examine the person's success in past study, and as an aptitude test when it is used to forecast his success in some future course or assignment.[1]

One of the most frequently used tests for the purpose of identifying prospective computer programmers is the Programmer Aptitude Test published by IBM. The test sample used for Standardization of the Test was 100 programmers from a course at IBM, New York.[2]

The Programmer Aptitude Test is a general intelligence test which attempts to measure the ability of a person to acquire those skills needed to become a successful programmer. There is a lack of agreement about the ability of the test to measure what it claims to measure. The test, for example, does not measure motivation and may not begin to measure all the other qualities that may be required.[3]

Usually Programmer Aptitude Tests are given, and the results are assigned a high weight in the selection process. While such tests are useful, they must be used with caution. Detailed studies have shown correlations of 0.1, 0.2, or even negative correlation between aptitude tests' scores and supervisor's rating of programmer performance.[4]

W. J. McNamara and J. L. Hughes[5] who authored the PAT for IBM, published in the Personnel Psychology Journal some interesting facts concerning the Programmer Aptitude Test. Their article introduced the need for computer programmers and briefly outlined the characteristics that make a good programmer. They concluded that, although programmers' jobs differ in different companies, there appears to be general agreement on one of the basic requirements for a good programmer. The requirement is reasoning ability. They also stated that since the job of a programmer is essentially problem-solving, some facility in reasoning ability would be expected. The level of reasoning ability, however, would vary from job to job.

To measure the reasoning ability of applicants for programming positions, the authors developed the Aptitude Test for EDPM Programmers in 1955. In 1959, the name of the test was changed to the Programmer Aptitude Test. According to the authors, the test was patterned after the items found in the O-part of the ACE Psychological Examination.

The Revised Programmer Aptitude Test developed in 1959 was an alternate form of the original test. Although these tests were designed initially to aid in the selection of beginner programmers, the authors found significant evidence that PAT might also be related to the performance of programmers on the job.

The authors also stated in their article that other studies had been done on the Programmer Aptitude Test. Some of these studies showed a correlation between the test score and success of tested personnel. Others showed no correlation between the test and success. The authors made no attempt to explain these differences.

The following information was extracted from an article in the Data Processing Digest by Gordan Davis.[6]

History of personnel selection

Personnel selection is not a new subject, of course. Nor, indeed, are efforts to select qualified novices, to appraise the performance of experienced personnel, or to identify competent technical leadership potential. What managers must realize is that testing procedures--however venerable or widely used--do not remove all the uncertainty from the tasks the tests are designed to serve: tests never have done so and they never will. (For example, no known test correlates a subject's motivation with his technical qualifications: thus, a subject may have all of the attributes necessary to successful performance of a task except the one--motivation--whose absence is certain to lead to his failure to perform up to the predicted level.)

All of the larger manufacturers of computers offer assistance in the selection of novice programming personnel. The most widely used test is that of the largest manufacturer: IBM's Programmer Aptitude Test (PAT). PAT has been and is being used with varying degrees of success by differing groups. Research has indicated that the cutoff score--the score required to "pass"--varies somewhat with the population being tested. Hence, it is desirable to validate PAT for use in the population of subjects with which you are concerned. It may be necessary to conduct such validation yourself, if IBM cannot supply you with the data you seek. Similar remarks apply to all tests like PAT.

Perhaps we can summarize by saying that the practices of administering tests like PAT is widespread, but that the use of the results has been too uncritical: the test should never be used alone because it measures only one facet of the whole individual who is to be selected. The use of a battery of tests to measure aptitudes for several of the "skills" that are required in the performance of their duties by data processing personnel is recommended by other recent research. The list of aptitudes is illuminating as the results: general learning ability, verbal aptitude, spatial aptitude, form perception, clerical perception, motor co-ordination, finger dexterity, manual dexterity. The first four aptitudes in the preceding list were shown to be the key aptitudes for "system analysts" and "programmers", whereas, only the first three were determinant for console operators.

Oliver and Willis[7] conducted a study in 1963 at Southern Illinois University to determine the validity of the PAT in predicting final grades in a computer programming course. Final grades in the course were based upon a demonstration of proficiency in integration and application of computer programming principles.

Their sample consisted of the twenty-seven students completing the course. Fourteen students who did not finish the course were excluded from the study. Oliver and Willis administered the PAT to class members at the beginning of the course. The results of the examination were withheld from the instructor until course grades were submitted. The grading system used was a five point system.

The results of Oliver and Willis' study showed a mean of 52.22, a standard deviation of 11.16, and a correlation coefficient of .78. They concluded, "It is evident that the PAT has, in this study, demonstrated exceptionally high utility for predicting grades in a computer programming course." But they also decided that because of the small size of their sample another test should be run. By omitting the fourteen students who did not complete the course or almost 1/3 of their class, they may have completely prejudiced their study.

T. C. Rowan[8] in Psychological Tests dated 1956, also addressed himself to the problem of the selection of computer programmers. Rowan felt that the personnel selection problem was particularly critical in the computer programming field. The scarcity of potential programmers, the training required, and the rapid increase in the number of firms requiring the services of such individuals point up the need for selection tools.

Rowan noted that an aptitude test which relates positively with success in a programming course may not be equally as effective in selecting working programmers. Rowan goes on to say, it is quite another thing, however, to accept such evidence as conclusive for the inclusion of the test in selection procedures. The author concluded that it was quite possible that a test could be related to programming course grades and not be suitable for selection of programmers on the job. Rowan concluded that this is due to the fact that success in vocational courses is a function of many variables, only one of which is mastery of, or aptitude for, the subject matter of the course.

Summary

The review of related literature shows little published work is available on the Programmer Aptitude Test. The available studies reflect opposite opinions concerning the validity of the Programmer Aptitude Test.

FOOTNOTES

[1]Lu J. Cronbach, Essentials of Psychological Testing (New York, 1960), p. 126.

[2]IBM, Manual for Revised Programmer Aptitude Test (1958).

[3]Donald H. Sanders, Computers in Business: An Introduction (New York, 1968), p. 243.

[4]Richard G. Canning and Rodger L. Sesson, The Management of Data Processing (New York, 1967), p. 36.

[5]W. J. McNamara and J. L. Hughes, "A Review of Research on the Selection of Computer Programmers," Personnel Psychology, Spring, 1971, p. 39.

[6]Gordan Davis, Data Processing Digest, October, 1966, p. 3.

[7]T. C. Oliver and W. K. Willis, "A Study of the Validity of the Programmers Aptitude Test," Educational and Psychological Measurements, XXIII, W (1963), p. 823.

[8]T. C. Rowan, "Psychological Tests and Selection of Computer Programmers," Psychological Tests (1956), p. 351.

CHAPTER III

METHOD OF DATA COLLECTION

The ten schools which comprise the state computer network (Appendix A), were surveyed for the purpose of this study to determine which of those schools administered the Programmer Aptitude Test to their beginning programming students. It was determined that three schools gave the Programmer Aptitude Test on a regular basis. These schools are as follows:

1. O. T. Autry Area Vocational-Technical School, Enid.
2. Oklahoma City Area Vocational-Technical School, Oklahoma City.
3. Tri-County Area Vocational-Technical School, Bartlesville.

These three area vocational-technical schools are included in the study.

Data were collected from the three schools by letters from the people involved in giving the tests. A summary of the collected data is shown in Table I. This table shows that the Programmer Aptitude Test has been given at the Oklahoma City School for two years covering two high school classes. O. T. Autry administered the test over a period of four years to four post-high school classes. The test was administered at Tri-County Tech over a three year period to nine post-high school and adult classes.

TABLE I

SUMMATION OF DATA BY SCHOOL, DATE ADMINISTERED, STUDENTS PER SCHOOL, AND STUDENT CLASSIFICATION

	YEARS ADMINISTERED	STUDENTS PER SCHOOL	STUDENT CLASSIFICATION
Oklahoma City	1969-70	48	High School
O. T. Autry	1967-70	59	Post High School
Tri-County Tech	1968-70	143	Post High School and Adult
TOTAL		250	

The following information was collected by letter from each of the three schools included in the study:

1. Name
2. Programmer Aptitude Test Score
3. Grade at the end of the first semester of period of study
4. Student classification
5. Starting class date

The letter grades received from the schools were converted to a numeric value so that they could be analyzed for statistical purposes. A grade of A equals 4, B equals 3, C equals 2, D equals 1 and F or Incomplete equals 0.

The score on the PAT can range from 0 to 82 points. A score of 60 points is considered by IBM to be a high score. Scores higher than 60 points are seldom achieved because the time allotted to take the test usually expires before the test is completed.

To further help classify the collected data, each class was assigned a number within each school. The classes were assigned this

number beginning with the class having the oldest starting date as number 1. This number is referred to as the school class number.

Data used in this study, which is based on the data collected by letter from the three schools, is presented in detail in Appendix B. The data presented in Appendix B are school (name), school class number, student classification, PAT test score, and the grade (numeric value) for each student considered in the study.

Statistical Treatment

Correlation, as used in this study, is the product moment correlation coefficient r developed by Pearson. According to this concept the degree of relationship between paired scores is called "correlation". If correlations of proper degree are found between the two variables, it would be possible to use those results for predictive purposes. If this study showed a significant correlation between the PAT score and the class grade, a t test was used to determine the reliability of the sample for predictive purposes. The results of the t tests are referenced to a table of confidence to determine if the results are usable for predictive purposes.

The formula used to calculate product moment correlation for the coefficient r for the purpose of this study is:

$$r = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{N\Sigma X^2 - X^2}\ \sqrt{N\Sigma Y^2 - Y^2}}$$

A correlation study was run on each class, on each of the three schools and on the sample as a whole.[1]

To see if the correlations obtained were usable for predictive purposes, a t test using the following formula was run on the total sample and the sample class with the highest positive correlation.[2]

$$t = r \sqrt{\frac{n - 2}{1 - r^2}}$$

A table of distributions of the value t, showing probability, was consulted, and it was determined that for a sample of 250 a t of 1.96 would produce a level of probability equal to .05.[3] A sample of 12 needs a t of 2.36 to produce that same .05 level of probability. To be useful for predictive purposes, a level of probability of better than .50 is required.

For the purpose of this study, r is the symbol used to represent product moment correlation.

FOOTNOTES

[1]Deobold B. Van Dalen, Understanding Educational Research, (New York 1966), p. 356.

[2]Chou Ya-lum, Statistical Analysis (New York, 1969), p. 618.

[3]Ibid., p. 779.

CHAPTER IV

ANALYSIS OF DATA

A correlation study to determine the relationship between the PAT score and grade (at the end of the first period or semester of study), was performed using the data collected from the three area vocational-technical schools included in this study. A separate correlation coefficient was calculated for each class, each school, and the total sample. The same calculations were accomplished for each student classification, high school, post high school, and adult. The results were used to answer the following questions.

1. Is there a correlation between the score of the Programmer Aptitude Test and students' achievement (as measured by grade) at the end of the first semester or period of study that can be used to predict success?

2. Is there a variation in correlation between the results on the Programmer Aptitude Test and student achievement (as measured by grade) between high school, post high school, and adult students?

A breakdown of the sample is depicted in Table II. This table shows that Tri-County Tech administered the test to nine classes with a total of 143 students. Oklahoma City Area School gave the PAT to two classes with a total of 48 students, and O. T. Autry had four classes and 59 students. This study, therefore, contained a sample of 250 students.

TABLE II

BREAKDOWN OF TOTAL SAMPLE COLLECTED

SCHOOL	SCHOOL CLASS NUMBER	TOTAL STUDENTS	SCHOOL TOTAL	STUDENT CLASSIFICATION
Tri-County Tech	1	13		P
Tri-County Tech	2	24		A
Tri-County Tech	3	25		P
Tri-County Tech	4	17		A
Tri-County Tech	5	7		P
Tri-County Tech	6	13		A
Tri-County Tech	7	12		P
Tri-County Tech	8	16		P
Tri-County Tech	9	16		A
Tri-County Tech	All		143	
Oklahoma City	1	23		H
Oklahoma City	2	25		H
Oklahoma City	All		48	
O. T. Autry	1	20		P
O. T. Autry	2	15		P
O. T. Autry	3	10		P
O. T. Autry	4	14		P
O. T. Autry	All		59	
TOTAL		250		

Student Classification Code: High School = H, Post High School = P and Adults = A.

Table III displays the distribution of students by the three student classifications within each school. The three levels of classification are high school, post high school, and adult. High school students are students in a day school program who have not completed the 12th grade. Forty-eight high school students are included in this study comprising 19.2 percent of the total sample.

Post high school students are students who have completed high school or its equivalent. There are 132 students in this classification included in the study, accounting for 52.8 percent of the sample.

Adult students for the purpose of the study are students who attend night school. There are seventy of these students comprising 28 percent of the total sample.

TABLE III

DISTRIBUTION OF STUDENTS BY HIGH SCHOOL AND CLASSIFICATION OF STUDENT

SCHOOL	HIGH SCHOOL	POST HIGH SCHOOL	ADULT	TOTAL TESTED
Tri-County Tech	0	73	70	143
Oklahoma City	48			48
O. T. Autry	—	59	—	59
TOTALS	48	132	70	250

A correlation study was made of the fifteen individual classes. The results of these calculations are shown in Table IV. Classes ranged in size from seven to twenty-five students. The correlations r ranged

from .00 for class 6 to a +.28 for class 7. All correlations were positive.

TABLE IV

CORRELATION BETWEEN PAT SCORE AND GRADE RESULTS BY CLASS

SCHOOL	SCHOOL CLASS NUMBER	NUMBER OF STUDENTS IN THE CLASS	CORRELATION COEFFICIENT r
Tri-County Tech	1	13	+ .10
Tri-County Tech	2	24	+ .10
Tri-County Tech	3	25	+ .15
Tri-County Tech	4	17	+ .17
Tri-County Tech	5	7	+ .16
Tri-County Tech	6	13	+ .00
Tri-County Tech	7	12	+ .28
Tri-County Tech	8	16	+ .18
Tri-County Tech	9	16	+ .25
Oklahoma City	1	23	+ .01
Oklahoma City	2	25	.00
O. T. Autry	1	20	+ .04
O. T. Autry	2	15	+ .01
O. T. Autry	3	10	+ .04
O. T. Autry	4	14	+ .03
TOTAL		250	

Table V shows the results of the correlation studies for each of the three schools. The correlations were r = + .13 for Tri-County Tech, r = - .02 for Oklahoma City Area School, and r = + .08 for O. T. Autry School.

TABLE V

CORRELATION BETWEEN PAT SCORE AND GRADE RESULTS BY SCHOOL

SCHOOL	NUMBER OF STUDENTS	CORRELATION COEFFICIENT r
Tri-County Tech	143	+ .13
Oklahoma City	48	- .02
O. T. Autry	59	+ .08
TOTAL	250	

A correlation coefficient was calculated to see if any leveling was found when the total sample was run. The total sample of 250 students had a r of + .08.

TABLE VI

CORRELATION BETWEEN PAT SCORE AND GRADE FOR THE TOTAL SAMPLE

	NUMBER OF STUDENTS	CORRELATION COEFFICIENT r
Total Sample	250	+ .08

The correlation results for high school, post high, and adult classes are listed in Tables VII, VIII, IX. The range of r for high school was .00 thru + .01. The range of r for post high was + .01 thru + .28. The range of r for adult varied from .00 to + .25. The ranges for adult and post-high were greater than high school. The differences, however, cannot be contrived to have any meaning. It would appear, from examining these factors, that age and education make little difference in the results.

TABLE VII

CORRELATION BETWEEN PAT SCORE AND GRADE FOR HIGH SCHOOL CLASSIFICATION

SCHOOL	SCHOOL CLASS NUMBER	CORRELATION COEFFICIENT r
Oklahoma City	1	+ .01
Oklahoma City	2	.00

TABLE VIII

CORRELATION BETWEEN PAT SCORE AND GRADE FOR
POST HIGH SCHOOL CLASSIFICATION

SCHOOL	SCHOOL CLASS NUMBER	CORRELATION COEFFICIENT r
Tri-County Tech	1	+ .10
Tri-County Tech	3	+ .15
Tri-County Tech	5	+ .16
Tri-County Tech	7	+ .28
Tri-County Tech	8	+ .18
O. T. Autry	1	+ .04
O. T. Autry	2	+ .01
O. T. Autry	3	+ .04
O. T. Autry	4	+ .03

TABLE IX

CORRELATION BETWEEN PAT SCORE AND GRADE FOR
ADULT CLASSIFICATION

SCHOOL	SCHOOL CLASS NUMBER	CORRELATION COEFFICIENT r
Tri-County Tech	2	+ .10
Tri-County Tech	4	+ .17
Tri-County Tech	6	.00
Tri-County Tech	9	+ .25

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

A correlation study to determine the relationship between the Programmer Aptitude Test score and grade (at the end of the first period or semester of study), was calculated, using the data collected from three area vocational-technical schools. A separate correlation coefficient was calculated for each class, each school, and the total sample. The same calculations were accomplished for each student classification, high school, post high school, and adult. The results were used to answer the following questions:

1. Is there a correlation between the score on the Programmer Aptitude Test and students' achievement (as measured by grade) at the end of the first semester or period of study, that can be used to predict success?

2. Is there a variation in correlation between the results of the Programmer Aptitude Test and student achievement (as measured by grade) between high school, post high school, and adult students?

Summary

At the three schools included in this study, the Programmer Aptitude Test was given to fifteen different classes over a four-year period. There were two hundred fifty students in these classes. Twenty-three separate correlation studies were completed on the various parts

of the sample. A correlation study was run on each class, each school, and the total sample.

The results of these correlation studies may be summarized as follows:

1. The correlation coefficients for each class ranged from .00 to + .28 on a scale of + 1.00.

2. The correlation coefficients for the schools ranged from a - .02 to + .13.

A t text was used to determine if the results could be used for predictive purposes. This test was run on the total sample and on the class that showed the highest correlation. The t test results for the sample of two hundred fifty resulted in a t of 1.26. The same test was performed on Tri-County Tech's class number seven and a t of .92 was obtained. The results of that test were below the level of significance necessary for prediction at the .50 level of probability.

The range of the correlation coefficients for the high school level classes ranged from .00 to + .01. The range of the post high school classes was + .01 to + .28, and for the adult classes r ranged from .00 to + .17.

Conclusions

Question 1. Is there a correlation between the score on the Programmer Aptitude Test and students' achievement (as measured by grade) at the end of the first semester or period of study that can be used to predict success?

The study showed no correlation coefficient between the Programmer Aptitude Test and student achievement at the end of the first period of study that was high enough to be a predictive value.

Question 2. Is there a variation in correlation between the results on the Programmer Aptitude Test and student achievement at the end of the first period of study that was high enough to be a predictive value?

An examination of the correlation coefficients for the three grade levels showed no significant difference in the three coefficients. The size of the high school sample was limited and may be too small to draw a positive conclusion concerning difference.

Recommendations

Based on the findings of this study the following recommendations are made:

1. The Programmer Aptitude Test published by IBM Corporation should not be used as a sole criterion for student selection in public education. With proper standardization the test may be used in conjunction with other selection tools.

2. Research should be done to determine valid selection techniques for data processing personnel.

3. A comprehensive study of selection criterion in other technologies may be helpful in determining the ability of prospective data processing students.

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APPENDIX A

LIST OF TEN SCHOOLS ON THE SHARED COMPUTER SYSTEM

TEN SCHOOLS

1. Tri-County Tech . . . . . Bartlesville
2. Northeastern Oklahoma A&M College . . . . . Miami
3. Oklahoma State Tech . . . . . Okmulgee
4. O. T. Autry . . . . . Enid
5. Oklahoma City Area School . . . . . Oklahoma City
6. Tulsa Area School . . . . . Tulsa
7. Duncan Area School . . . . . Duncan
8. Altus Junior College . . . . . Altus
9. Cameron State College . . . . . Lawton
10. Eastern Oklahoma State College . . . . . Wilburton

APPENDIX B

A PRESENTATION OF DATA USED IN THE STUDY

The following is a list of the data collected from the three area vocational-technical schools included in this study.

A PRESENTATION OF DATA USED IN THE STUDY

SCHOOL	SCHOOL CLASS NUMBER	STUDENT CLASSIFICATION	PAT TEST SCORE	GRADE (NUMERIC (VALUE)
Tri-County Tech	1	Post High	25	3
			02	2
			08	2
			17	3
			19	3
			21	0
			24	3
			25	2
			32	3
			34	2
			40	4
			46	4
			47	4
	2	Adult	30	0
			49	3
			41	4
			11	0
			36	2
			46	2
			07	0
			36	0
			41	0
			31	0
			47	0
			31	3
			50	3
			32	4
			31	2
			31	3
			45	4
			50	0
			48	3

A Presentation (Cont't)

SCHOOL	SCHOOL CLASS NUMBER	STUDENT CLASSIFICATION	PAT TEST SCORE	GRADE (NUMERIC VALUE)
			53	3
			19	0
			51	0
			00	2
			00	0
Tri-County Tech	3	Post High	44	0
			36	0
			45	4
			30	0
			35	3
			28	1
			26	0
			06	0
			63	2
			41	2
			57	3
			19	3
			38	3
			35	3
			30	0
			21	1
			27	0
			54	3
			51	4
			00	0
			38	3
			19	2
			25	0
			20	0
			48	4
Tri-County Tech	4	Adult	22	0
			21	0
			36	0
			22	0
			43	4
			33	0
			11	0
			09	3
			51	3
			47	4
			26	0
			40	3
			47	3
			14	0

A Presentation (Cont't)

SCHOOL	SCHOOL CLASS NUMBER	STUDENT CLASSIFICATION	PAT TEST SCORE	GRADE (NUMERIC VALUE)
			42	4
			27	2
			38	0
Tri-County Tech	5	Post High	00	0
			38	4
			35	3
			31	0
			57	3
			48	0
			32	0
Tri-County Tech	6	Adult	05	4
			10	3
			17	2
			20	0
			33	0
			41	0
			42	3
			43	0
			53	0
			54	0
			57	3
			61	4
			62	4
Tri-County Tech	7	Post High	49	4
			48	2
			42	2
			52	0
			39	1
			26	2
			11	1
			11	0
			10	0
			03	0
			01	0
			45	3
Tri-County Tech	8	Post High	51	3
			43	4
			41	0
			41	3
			35	0
			35	0
			33	2
			32	0
			31	0

A Presentation (Cont't)

SCHOOL	SCHOOL CLASS NUMBER	STUDENT CLASSIFICATION	PAT TEST SCORE	GRADE (NUMERIC VALUE)
			31	4
			30	0
			27	4
			11	0
			09	0
			00	0
			00	0
Tri-County Tech	9	Adult	25	0
			43	2
			19	0
			34	3
			20	2
			24	0
			27	0
			08	0
			32	2
			17	0
			58	4
			67	4
			29	0
			41	3
			60	2
			48	3
Oklahoma City	1	High School	63	4
			55	2
			55	3
			52	3
			45	3
			45	2
			45	2
			45	3
			45	2
			45	2
			45	2
			45	3
			45	2
			45	2
			45	2
			45	3
			45	3
			45	1
			45	3
			45	1
			45	3

A Presentation (Cont't)

SCHOOL	SCHOOL CLASS NUMBER	STUDENT CLASSIFICATION	PAT TEST SCORE	GRADE (NUMERIC VALUE)
			45	3
			46	2
Oklahoma City	2	High School	47	4
			43	4
			41	4
			38	4
			38	2
			37	2
			35	1
			35	3
			35	3
			33	3
			33	4
			32	4
			32	3
			31	2
			30	4
			30	2
			30	3
			29	3
			28	4
			28	4
			28	3
			27	2
			27	4
			21	4
			19	4
O. T. Autry	1	Post High	51	3
			49	4
			47	3
			45	3
			43	2
			37	2
			36	2
			34	2
			33	3
			32	2
			31	2
			41	2
			43	2
			41	2
			44	3
			61	4
			41	2

A Presentation (Cont't)

SCHOOL	SCHOOL CLASS NUMBER	STUDENT CLASSIFICATION	PAT TEST SCORE	GRADE (NUMERIC VALUE)
			38	0
			38	0
			37	1
O. T. Autry	2	Post High	37	0
			53	0
			48	2
			44	2
			38	2
			37	2
			56	3
			50	1
			40	2
			41	0
			54	4
			55	2
			39	3
			46	3
			40	2
O. T. Autry	3	Post High	40	2
			50	2
			63	4
			57	3
			49	3
			49	0
			31	2
			36	2
			46	4
			28	2
O. T. Autry	4	Post High	59	4
			44	2
			33	1
			52	3
			24	2
			34	3
			59	2
			49	2
			30	2
			55	3
			36	2
			39	3
			47	2
			62	3

VITA

Lorin George Vogeding, Sr.

Candidate for the Degree of

Master of Science

Thesis: THE VALIDITY OF THE PROGRAMMER APTITUDE TEST AS A PREDICTOR OF SUCCESS IN SELECTED OKLAHOMA AREA VOCATIONAL-TECHNICAL SCHOOLS' DATA PROCESSING PROGRAMS

Major Field: Technical Education

Biographical:

Personal Data: Born in St. Louis, Missouri, August 26, 1939, the son of Mr. and Mrs. George O. Vogeding.

Education: Graduated from Beaumont High School, St. Louis, Missouri, June, 1957; received the Bachelor of Arts degree, Westminster College, Fulton, Missouri, June, 1961, with a major in Psychology; completed the requirements of the Master of Science degree at Oklahoma State University with a major in Technical Education in May, 1972.

Professional Experience: Data Processing Management, St. Louis, Missouri, 1961-63; President, Data Control Systems, Inc., Mobile, Alabama, 1964-68; Instructor, Tri-County Area Vocational-Technical School, Bartlesville, Oklahoma, 1969-72.

Professional Organizations: Oklahoma Education Association, National Education Association.