

THREE PREDICTIVE INSTRUMENTS
USED TO FORECAST SUCCESS ON
TESTS OF GENERAL EDUCATIONAL
DEVELOPMENT (GED)

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THREE PREDICTIVE INSTRUMENTS USED TO FORECAST SUCCESS ON
TESTS OF GENERAL EDUCATIONAL DEVELOPMENT (GED)

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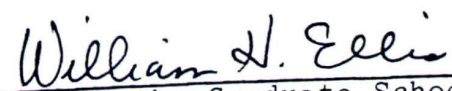
by
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To the Graduate Council:

I am submitting herewith a Research Paper written by Lang K. Coleman entitled "Three Predictive Instruments used to Forecast Success on Tests of General Educational Development (GED)." I recommend that it be accepted in partial fulfillment of the requirement for the degree of Master of Arts with a major in Psychology.


Major Professor

Accepted for the
Graduate Council:


Dean of the Graduate School

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Chapter 1

INTRODUCTION

The purpose of the present paper is to explore the literature pertaining to the prediction of success on the Tests of General Educational Development (GED). Three pretest measures will be examined in light of research correlating results on these instruments with results on the GED.

The rationale for using a predictive instrument to forecast success on the GED lies in the fact that as a tool of the education counselor it can "reduce...(greatly) the frustration and subsequent disillusionment by examinees who fail to qualify on the GED test" (Musgrove, 1981, p. 1). Knowledge of the results will create a positive attitude in the examinee and will give the candidate an empirical basis for his/her preparatory studies. If a counselor has a test that is designed for this purpose, the candidate has some direction in deciding what material and how intensely to study (Musgrove, 1979).

Chapter 2

HISTORY OF THE GED

The Tests of General Educational Development (GED) were developed by the American Council on Education. The purpose of the examinations is to give those individuals who have not graduated from high school, for whatever reason, a chance to demonstrate that they have attained the educational level usually acquired in high school.

In 1942 the first Tests of Educational Development were developed by the United States Armed Forces Institute (USAFI) to measure "the major outcomes and concepts generally associated with four years of high school education" (Military GED Manual, 1977). Initially, these tests were offered only to military personnel. Basically, the military was trying to give World War II veterans a chance to pursue educational goals that had been interrupted by the war. USAFI established a staff of civilian testing experts who worked closely with committees from the American Council on Education, the National Association of Secondary School Principals, and regional accreditation agencies. It was in this way that the USAFI staff developed the basic concepts that underlie the examination program.

The Veteran's Testing Service administered the

testing program from 1945 to 1963. In the 1950's, however, it became clear there was a need for an expanded program to include civilians. The American Council on Education took the lead in developing a battery of tests suitable for that purpose. In 1963 the American Council on Education's General Educational Development Testing Service began administration of the testing program. The GED program has grown rapidly since that time. It now serves more than 800,000 people annually. This figure reflects the number of people who attempt the battery, not the number who actually receive the equivalency certificate. There are now more than 2,700 official GED Testing Centers, including services to military personnel, civilians, civilians overseas, and prisoners (Aker, 1977).

At the present time the fifty states, the District of Columbia, six U. S. territories, and ten Canadian Provinces will award an equivalency certificate based on the results of the GED test battery. While the minimum standards vary from place to place in terms of scores required to receive the certificate, all the programs have the endorsement of the Council. The GED is widely accepted by the business community and the government, based to a great extent on the Council's recommendation and the acceptance of the examinations by the education community as a whole. The equivalency certificate is considered an

"official document" and, as stated previously, is accepted by most businesses and educational institutions. Most state colleges and universities as well as many private schools recognize the certificate as equivalent to the high school diploma in meeting the admissions criteria to their programs.

GED test batteries are available in several different languages; for example, English, Spanish, and French. The English language version is also available in braille.

When a candidate is administered the GED test, the results of the battery are compared to the results of a national norm group. The norm group has included graduating high school seniors in all five of the norming studies that have been conducted up to this time. The most recent study for establishing norms was completed in 1980. These studies are the basis for the conversion of the "number right" raw scores on the test to GED standard scores. It is on the basis of the standard scores that the High School Equivalency certificate is issued. As can be seen by the test scores being compared to a normative group of high school graduates, the test shows that the candidate has at least attained the educational skills of those seniors who are completing a high school program.

The rationale for using graduating high school seniors is, of course, that the traditional diploma and the GED

are equivalent in terms of the attained educational skills. In order to keep that comparability current, normative studies have been conducted on five occasions. The original study was conducted in 1943 using the battery that required ten hours to complete. Normative data were established on the same version of the tests again in 1955 and 1967. Normative data for a new edition requiring only seven and one-half hours for testing were established in 1977 and again in 1980. Standard scale scores have been adjusted up (and sometimes down) to correspond with the most recent results.

The 1977 and 1980 studies were conducted by the Educational Testing Service and were essentially identical. The same sampling procedure was used in each case. The number of high school students sampled was slightly different. Approximately 3,500 students were tested in 1977. A sample of 3,600 students were given the examination in 1980. On both occasions all five tests in the GED battery were given to the students under the same testing conditions that would prevail if they were being given the test for the actual certificate.

The most recent norm group, the 1980 seniors, performed slightly lower in terms of raw scores than did their colleagues in 1977. Adjustments were made in the scaled score tables in 1981 to reflect this difference. An

examinee can answer fewer questions correctly today and still receive the minimum score necessary to receive the equivalency certificate.

When discussing prediction results on the GED, it is important to consider minimum score requirements. A part of the counselor's job is to assist the individual to make a choice concerning the possibility of his or her chance of success on the battery. The minimum standards as set by the different states, provinces, and territories are very important. These scores are usually set by the state level departments of education or their equivalents in the provinces and territories. There is no national standard. Each local program can require a different score. Residency requirements are also varied. Generally, the minimum scores required are stated as minimum scores on each one of the five tests in the battery, or the mean of the five subtest scores, or a combination of the previous. In all cases it is the standard score that is important. When both minimum subscale and minimum average scores are required, two approaches can be taken by the accrediting authority. The first is to require one or the other; for example, a candidate could have substandard scores on two areas and still receive the certificate based on an overall average score which exceeds the minimum average score required. However, a candidate could receive the certificate

on the basis of the subtest scores, all of which exceeded the minimum, when the overall average would not be sufficient. The second, and more common approach, is to require both minimum subtest scores and minimum overall average scores. Refer to Table 1 for the minimum requirements that are currently in effect for the program.

It should again be mentioned that the different state, province, and territory programs have different requirements for issuance of the equivalency certificate. Table 1 shows the lowest minimum subscale and overall average score which corresponds to a standard score of 35. This score is similar to that of a group of graduating high school seniors who scored at the 7th percentile on a given test. In other words, on one test 93% of those examined exceeded that score. Other standard scores and percentages related to these scores are given for reference in Table 2.

Table 1

Minimum Acceptable Scores by Program
for Passage of the GED Test Battery

Program Location	Minimum Standards	
	Subtest	Overall
United States		
Alabama	35	45
Alaska	35	45
Arizona	35	45
Arkansas	35	45
California	35	45
Colorado	35	45
Connecticut	35	45
Delaware	40	45
District of Columbia	35	45
Florida	40	45
Georgia	35	45
Hawaii	35	45
Idaho	35	45
Illinois	35	45
Indiana	35	45
Iowa	35	45
Kansas	35	45
Kentucky	35	45
Louisiana	35	45
Maine	40	45
Maryland	35	45
Massachusetts	35	45
Michigan	35	45
Minnesota	40	45
Mississippi	35	45
Missouri	35	45
Montana	40	45
Nebraska	35	45
Nevada	35	45
New Hampshire	35	45
New Jersey	40	50
New Mexico	35	45
New York	35	45
North Carolina	40	50
North Dakota	35	45
Ohio		

Table 1 (continued)

Program Location	Minimum Standards	
	Subtest	Overall
Oklahoma	35	45
Oregon	40	40
Pennsylvania	35	45
Rhode Island	35	45
South Carolina	45	45
South Dakota	40	50
Tennessee	35	45
Texas	40	45
Utah	40	45
Vermont	35	45
Virginia	35	45
Washington	35	45
West Virginia	35	45
Wisconsin	35	45
Wyoming		
Canadian Provinces		
	40	45
British Columbia	45	45
Manitoba	35	45
New Brunswick	39	44
New Foundland	40	45
Northwest Territories	45	45
Nova Scotia	35	45
Prince Edward Island	40	45
Saskatchewan	40	45
Yukon Territory		
Territories		
	35	35
American Samoa	40	45
Panama	35	45
Guam	35	45
Kwajalein Island	36	50
Pureto Rico	35	35
Trust Terr. of the Pacific Islands	35	45
Virgin Islands	35	35
Commonwealth, N. Marianas Islands		

Note. Minimum standard scores, February, 1981, listed in a GED Testing Service Memo dated July, 1981.

Table 2
GED Norming Study Results

Minimum Score/s Required	Corresponding Percentile
35 or mean 45	84
35	83
40 or mean 45	73
40 or mean 50	70
mean 45	70
35 and mean 45	69
40	69
40 and mean 45	67

Note. N = 686, 1980 norming study as cited in a GED Testing Service memo dated July, 1981.

Chapter 3

PREDICTORS OF GED SUCCESS

Several instruments have been used to predict success on the GED. In this chapter three of those instruments will be examined along with the research they have spawned.

A review of the literature revealed several studies correlating Adult Basic Learning Examination III (ABLEIII) scores with results on the GED. The Adult Basic Learning Examination (ABLE) is a standardized achievement test for use with adult subjects. There are three levels, each level having two forms, A and B. Level I is used with Grades 1-4, Level II for Grades 5-8, and Level III for Grades 9-12. The test consists of five subtests that examine achievement in the following academic areas:

Vocabulary, Spelling, Reading, Arithmetic Computation, and Arithmetic Problem Solving (Shaffer, 1974).

The tests of General Educational Development (GED) are designed to measure achievement in the following areas: Correctness and Effectiveness of Expression (the Writing Skills subtest), Interpretation of Reading Materials in Social Studies (the Social Studies subtest), Interpretation of Reading Materials in Natural Sciences (Natural Sciences subtest), Interpretation of Literary Materials (Reading Skills subtest), and General Mathematical Ability

(the Mathematics subtest) (Hopkins, Waggener, and Starr, 1974).

Of the three studies in the literature which examined the results of the ABLE as a predictor of success on the GED, the one that produced the most significant results was a cooperative study conducted in 1973 by the Test Department of Harcourt Brace and Jovanovich, Inc. and the United States Armed Forces Institute (USAFI).

The subjects of the research were 1,376 GED examinees at six Army bases. Before the subjects were given the GED test battery they were administered either ABLE Level II, Form A or ABLE Level III, Form A. The decision to give a subject ABLE II or ABLE III was based on the subject's performance on a screening test called the Select ABLE. The tests were then administered and the resulting data were analyzed. Pearson product-moment correlations, bivariate frequency distributions, and multiple correlations were computed as part of the analysis of the data.

Expectancy tables were constructed to provide a means of making predictions of success using either ABLE II or ABLE III test results. It was demonstrated that ABLE III scores correlated more highly with the GED results, both subtests and overall scores, than did the results of the ABLE II. The correlation coefficients ranged from .31 to .74 for ABLE III and .12 to .52 for ABLE II. The highest

correlations were obtained on ABLE and GED subtests that were most similar in informational content. Those correlations range from .59 to .74 for ABLE III and from .33 to .52 for ABLE II. The researchers urge caution in using their results because of the research design. The design of the study placed individuals who had the lowest levels of achievement as measured by the screening test, the Select ABLE, into the ABLE II group. Those with the higher level of skill were tested with the ABLE III. When the GED was administered the subjects who were in the ABLE II group did not do as well as their colleagues in the ABLE III group. The authors contend that this restriction of range in the criterion variables could lead to an overall reduction in the size of the correlation coefficients.

The researchers designed several charts to describe the relationship between scores on the ABLE III subtests and predicted results on the GED test battery. Interpretation of the charts as developed from this study is rather difficult. The counselor in advising a prospective GED candidate would have to consult up to seven different charts to make an adequate prediction. The ranged scores on the charts are divided into three groups according to the GED equivalents. This grouping corresponds to the most frequently required minimum scores in the different

equivalency programs. There are groups that contain predicted standard scores of 20 to 34, 35 to 44, and 45 to 80. These three groups are on the ordinate of the tables. The abscissa contains score groupings for results of ABLE III testing. These are given in terms of raw scores. The charts are constructed by comparing the subtest of the GED with the subtests of the ABLE III that corresponds mostly in terms of content. ABLE III Reading subtest scores are correlated on the charts with the Social Studies Science, and Reading Skills subtests of the GED battery. Chances of receiving a certain score that would correspond to another score, that is ABLE III to GED, is expressed in terms of a percentage of those in the sample group who made similar scores. If a candidate received a raw score (number correct) of 40 on the ABLE III Reading subtest the chances of that person receiving GED scores would be as follows: on the Social Studies subtest a 7% chance of 20-34, a 33% chance of 35-44, and a 59% chance of 45-80; on the Science subtest a 7% chance of 20-34, 25% chance of 35-44, and 68% chance of 45-80; the Reading Skills subtest would have probabilities of 5%, 29%, and 66% in the score categories mentioned. The counselor can therefore advise the candidate concerning the probabilities of success on the battery in terms of percentages. Similar charts have been constructed to

give an overall view of success on the whole battery.

The General Educational Performance Index was introduced in 1975 as a tool designed to help counselors advise candidates concerning their chances for passing the GED. In 1979 the Official GED Practice Tests or Pre-GED (PGED) were provided for the same purpose. The tests were developed by the General Educational Development Testing Service. A review of the literature revealed, as in the case of all GED predictive instruments, a lack of research with these instruments. Two studies were found which evaluated the predictive validity of these tests. Both of these research efforts were conducted by Walter Musgrove (Musgrove & Musgrove, 1979; Musgrove, 1980).

The PGED and the GED have basically the same format; however, the PGED is precisely half the length of the GED. It has half the number of questions in each subtest, and the examinee is allowed half the time he/she would be allowed on the GED. Scores are calculated in the same manner as the GED. The number right raw score is converted to a GED standard score. The resulting five scores are then averaged. The PGED is designed to be scored immediately. On the answer sheets the questions are broken down into subject areas for ease in counseling the candidate concerning areas that a person might want to study prior to attempting the "real test."

Musgrove's initial study (1979) used only the General Educational Performance Index (GEPI). The study published in 1980 used both of the instruments and can be considered a replication of the first study using the GEPI. The subjects in the 1980 study were 65 adult students enrolled in the adult education program in Pasco County, Florida. Scores on the pretests and the GED scores along with the sex of the candidate were the only data obtained

In the 1980 study by Musgrove, the PGED and the GED were both administered by trained examiners. The PGED was scored immediately and the GED was administered in the usual fashion at the testing centers. Pearson product-moment correlation coefficients were computed for each PGED subscale and its corresponding GED score. Six regression equations were developed to predict performance on the GED from the PGED. Cross validation work was then completed with a group of 28 subjects who took the tests in the same manner as the original group. The PGED scores were substituted into the regression equations and predicted scores were obtained. Pearson product-moment correlation coefficients were computed for the predicted and obtained GED scores.

Mean scores on the PGED and the GED were nearly identical; the PGED mean was 47.80 and the GED was mean 47.84. The correlations between PGED and GED were all

positive and significant: Writing Skills, $r=.64$; Social Studies, $r=.76$; Science, $r=.64$; Reading Skills, $r=.69$; Mathematics, $r=.68$; and Average for the Battery, $r=.84$. Cross validation coefficients were also positive and significant. The GEPI was used in the cross validation part of the study because this test had earlier shown that it was a reliable predictor of GED results (Musgrove & Musgrove, 1979). Once again all the correlations were found to be positive and significant. When Musgrove examined the original and the cross validation coefficients it was found that the GEPI and the PGED predict performance on the GED about equally well in five of six areas. No significant differences exist in the coefficients in the areas of writing skills, social studies, science, or math scores. Overall average scores were found to be similar. The PGED was found, however, to have a significantly better predictive validity for reading skills subtest.

In his conclusions Musgrove indicates that the results of his work with these predictive instruments shows that the PGED is superior to the GEPI. He suggests that the counselor who deals with potential GED candidates could predict performance better by using the PGED. He points out that both instruments are reliable predictors, but contends that more research needs to be done in the area prior to formulating any definitive conclusions.

Chapter 4

METHODOLOGY

As the research with the PGED is very limited, this present researcher gathered data to investigate the predictive validity of the instrument. This study was conducted at the Army Education Center in Schwabach, West Germany.

The subjects were United States Army personnel. There were 23 men and 2 women in the group. They were all enlisted members of the Army and held various jobs in that capacity. They were all GED candidates and had received preliminary achievement testing and remedial instruction as appropriate prior to the administration of the PGED.

The subjects were administered the PGED in a formal test setting precisely as indicated in the PGED administration instructions. No formalized remedial instruction was given after the PGED was administered. The subjects were, however, counseled on the results of their PGED. The only data gathered were the PGED and GED scores. A Pearson product-moment correlation coefficient for each PGED subscore, and its corresponding GED score, and for the mean scores on both batteries was calculated. The number of subjects varied in four of the subtests because two of the

subjects did not complete the entire GED. Musgrove, in his 1980 study, concluded that PGED scores alone could be used to predict GED scores.

The data obtained are shown in Table 4.

The findings of Mus-

grove are based on the overall

data. All correlations were positive

All the correlations were

found by Musgrove except for the

which is .65 as compared to the

data. The data obtained

are shown in Table 4.

The standard error of estimate

in a regression equation. These

results are in great accuracy,

and are based on the GED.

The data indicate that the PGED

is a good predictor of the GED. The

results are clear.

The data are based on the

data obtained in

the study of candidates.

Chapter 5

RESULTS

The results of the present study are shown in Tables 3 and 4. These results corroborate the findings of Musgrove in his 1980 study. The mean scores on the overall batteries are very similar. All correlations were positive and significant at $p < .001$. All the correlations were greater than those calculated by Musgrove except for the Reading Skills correlation which is .66 as compared to the .69 calculated from the 1980 data. The data obtained resulted in the regression equations shown in Table 4. The table also contains the standard errors of estimate that were computed for each regression equation. These statistics can be used to predict, with great accuracy, the scores an individual would receive on the GED.

This study gives further confirmation that the PGED is a valid predictor of performance on the GED. The implications for the adult education counselor are clear. The PGED is a very good predictor of performance on the GED and, therefore, can be used by the counselor in directing the remedial study of prospective GED candidates.

Table 3
Means, Standard Deviations and Correlations

Subtest	PGED		GED		N	r
	Mean	S.D.	Mean	S.D.		
Writing Skills	44.96	6.54	45.50	7.40	24	.76
Social Studies	51.52	10.04	50.39	8.33	23	.85
Science	50.35	9.38	52.09	7.73	23	.69
Reading Skills	50.79	8.02	51.38	7.01	24	.66
Math	49.08	6.03	48.40	5.67	25	.74
Average	49.27	6.74	49.62	6.01	23	.90

Table 4

Regression Equations and Standard Errors of Measurement

Subtest	Predicted GED	Standard Errors of Estimate
Writing Skills	.86 PGED + 6.84	<u>+4.89</u>
Social Studies	.70 PGED + 14.17	<u>+7.09</u>
Science	.57 PGED + 23.44	<u>+5.37</u>
Reading Skills	.57 PGED + 22.23	<u>+5.39</u>
Mathematics	.69 PGED + 14.29	<u>+3.86</u>
Average	.80 PGED + 10.06	<u>+2.62</u>

Chapter 6

CONCLUSION

The GED tests have been in use for approximately 39 years, and from all indications they will continue to be used widely in the future. The tests have been a great help to those individuals who for one reason or another have not completed their high school education. They have given that "second chance" to millions of people who otherwise would have been required to complete night school classes or never receive recognition for their educational skills (Aker, 1977).

The adult education counselor in many different settings has the task of providing information concerning likelihood of success on these tests to many people. For many years after the GED program began predictions were made from tests of local origin, if they were made at all. An examinee could take the GED test for diagnostic purposes (Aker, 1977). However, unsuccessful candidates had to pay for the exam and then wait six months and pay again to retake the portions failed. In the past few years, however, the situation has changed. Three tests have been studied, albeit sparingly, to determine their ability as predictors of GED success. Two of the three were specifically designed for that purpose, the GEPI and the PGED.

Present research would suggest that the counselor use the PGED rather than the GEPI and the ABLE III, based on the correlational data discussed in this paper. The GED asks pointed questions about specific subjects; therefore, it would seem appropriate that the tests used to predict success on the GED should contain pointed questions about those same specific subjects. While the correlational data for the ABLE III are good, the test does not contain science or social studies questions. The other two tests examined by the present paper contain questions in those areas. These tests, as was mentioned previously, were designed specifically for the purpose of predicting success on the GED. Of the two tests the data for the PGED appears to be the most promising. It would seem beneficial for this area to be further researched; for example, the PGED and the GEPI could be administered to the same subjects. Hopefully, more study in the area will assist the adult education counselor in the task of advising GED candidates.

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