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ABSTRACT

This study was conducted to: (1) devise strategies to enable institutions of higher education to recruit talented students into teacher education; and (2) find the means for enabling "at risk" students to succeed on state mandated competency tests. The study identified and examined correlates of "at risk" and "at success" teacher candidates from three universities. The competency test scores and correlates of success or failure, such as grades, entrance examination scores, high school standing, and college classification were statistically analyzed for more than 400 students. Scores of the Pre-Professional Skills Test (PPST) were also analyzed. Both high school rank and class standing appeared to be strong variables for success in the PPST. Students with grade point averages over 2.5 generally scored higher on the PPST than did students with grade point averages below 2.5. Ethnicity was another variable associated with the success rate on the PPST. Recommendations are made for high school administrators and teachers regarding the effects of these variables on student success on the PPST. (CB)

REDESIGNING TEACHER EDUCATION TO RECRUIT TALENTED CANDIDATES AND REMEDIATE "AT RISK" CANDIDATES USING SKILLS TEST SCORES AND RELATED DATA

A Presentation to the Annual Conference

of

THE ASSOCIATION OF TEACHER EDUCATORS

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The decade of the 1980's may surely be labelled one of educational reform. Witness in this regard the mandates of A Nation at Risk: An Imperative for Educational Reform (1983) and several other national reports, the Gallup surveys (e.g. Gallup, G.H., 1984), numerous media (e.g. Omni, V.8, No 1, Oct. 1985) and organizational reports. Testing is by far the most frequently endorsed attempt at such reform. Sandifur (1985) reported that in 1984, thirty-eight states had mandated admission and/or certification testing and seven additional states were planning to introduce such tests.

Support for testing of pre-and in-service teachers has been a matter of extensive debate. de Hart and Connelly (1985) have summarized the positions of the proponents and opponents of teacher testing in general. Peter Garcia's study provides an excellent review of the issue of teacher testing with special reference to the effect on minorities. (Garcia, 1985).

Critics of testing point out the discrepancy between test score and performance. In their review, de Hart and Connelly (1985, pp. 1-4) cite research that indicates a negative correlation between scores on tests and achievement of students, and that tests emphasize knowledge, not performance, creativity or attitudes. Garcia (1985, p.9), citing a chapter in progress by Smith, states that "competency testing of teachers has taken root despite inadequate research to show a direct relationship between performance on paper-pencil tests and on-the-job competence." Gideonse (1985) reiterates this and claims that tests do not improve the caliber of those entering teaching. Anrig (1985) recommends caution regarding the momentum of teacher testing and points out that no standardized tests can accurately measure qualities such as dedication, motivation, perseverance, or caring.

In spite of these caveats, testing has become an integral part of teacher preparation. If the qualities cited above as not readily testable are indeed important qualities of teaching effectiveness, then some potentially adequate teachers are being eliminated by test scores. Testing, as Goertz et al, (1984) emphasize, filter out people rather than develop talent. If teacher education programs are to develop the talent of their candidates and comply with testing mandates, a proactive stance is indicated as Garcia (1985) and Lindahl and Wholeben (1985) stress.

With the requirement of passing scores on the Pre-Professional Skills Test (PPST) in Texas, individual institutional efforts and coordinated efforts for identification and remediation of some teacher candidates have been established in that state. Some such efforts at early identification and remediation of teacher candidates "at risk" have been reported. (Burns et al, 1985; Fisk, 1984; Heger, 1985; Johnson, 1985; Salinger, 1985). These and other reports, e.g. Markle et al, (1985), suggest that many of those pre-service teachers who are identified early, eventually will obtain passing scores. Goodison (1985), program administrator for the PPST at Educational Testing Service, points out that those who miss the passing scores by a few points have a reasonable chance for improved scores, a fact reiterated by Fisk (1984) based on his research. Efforts range from developing test taking skills (Dally and William, 1985) to freshman level pre-testing and concerted remediation (Burns et al, 1985). Among these efforts, little attention has been paid to students "at success", i.e., those with high test scores.

The article "Competency Testing of Teachers: An Attitude Survey of Prospective Teachers in Private and Public Universities" by de Hart and Connelly

(1985) recommended that Teacher Centers encourage research and devise programs that would help prospective teachers meet state competency test requirements. The Austin Cooperative Teacher Education Center, through state block grant funds, was able to continue research in the area of competency testing. The following study is the result of cooperative efforts of institutions which are members of the local Teacher Center.

Rationale

While research on early intervention and remediation of pre-service teachers facing required testing is growing, much of it is based on performance on similar tests given a year or two prior to the required examinations. The study reported here examines some possible earlier predictors of success or failure. Such early identification of teacher candidates can help to recruit talented students into teacher education, select candidates for accelerated programs, and locate those in need of remedial assistance. Other survey information collected in this study may lead to the determination of the type of assistance most helpful for students required to pass the PPST, such as type and duration of preparation, and the importance of perseverance.

Purpose and Objectives

The purpose of the study was twofold: (1) to devise strategies to enable IHE's to recruit talented students into teacher education and (2) to find the means for enabling "at risk" students to succeed on state mandated competency tests.

Specific objectives for the study were as follows: (1) to identify high-scoring and low-scoring groups of preservice teachers on the PPST; (2) examine

the differences between or among other subpopulations of the groups, e.g., date of test, number of test attempts, etc., (3) formulate a set of predictors that would lead to early identification of preservice teachers who would benefit from intervention, and (4) recommend programs for talented students, as well as for those who fail the PPST.

Procedure

Based on the objectives stated above, the study identified and examined correlates of "at risk" and "at success" teacher candidates relative to their performance on the PPST. The competency test scores and correlates of success and failure, such as grades, entrance examination scores, high school standing, and college classification were statistically analyzed for more than 400 college students who took the PPST in Spring, 1985. All students were from three member universities of the Austin Cooperative Teacher Education Center. The institutions included in the study were The University of Texas at Austin, St. Edward's University and Concordia Lutheran College in Austin.

Method

Data were collected on each subject from the student's respective institution. The following information was gathered: date of birth, sex, race, ethnic composition of high school attended, SAT/ACT scores, high school rank, cumulative hours at IHE prior to taking the PPST, grade average at IHE, major, score on PPST. The data were statistically analyzed using the Statistical Package for the Social Sciences (SPSS). Additionally, a survey which gathered information about the students' personal critique of the PPST and the amount of preparation they received for the PPST was mailed to the 372 subjects from the University of Texas at Austin.

Findings

In the frequency distribution for each PPST, the score range was 160 to 190 (Reading), 161 to 190 (Mathematics), and 163 to 188 (Writing). The mean score for both PPST Reading and Mathematics was about 179; the mean score for Writing was 177 (See Table 1). Discrepancies among n's for subscales was caused by not all students taking all tests. Passing scores set by the Texas State Board of Education were: Reading, 172; Mathematics, 171; Writing, 173.

Of the 402 subjects participating in the study, 319 had a reported GPA and took all three parts of the PPST. Of the 319, 291 or 91.2% of the students passed the PPST Mathematics and 28 or 8.8% of the students failed. The pass/fail rates in Reading and Writing were identical, that is, 282 or 88.4% passed the PPST in Reading and Writing, while 37 or 11.6% of the students failed.

Table 2 gives the distribution of students passing and failing the PPST in relationship to grade point average. Of students whose GPA exceeded 2.5, 216 or 67.7% passed the Reading test, while 21 or 6.6% failed this test. On the Mathematics test, 68.7% of students with a GPA exceeding 2.5 passed the test, and 18 or 5.6% failed this test. On the writing test 223 or 69.9% of students with GPA's exceeding 2.5 passed the test, while 14 or 4.4% failed. While 237 students had 2.5 averages or higher, 82 (25.7%) had averages equal to or less than 2.5. Sixty-six or 20.7% of students with the lower GPAs passed the Reading test, while 16 or 5% failed the test. Of the students with the lower GPAs who took the Mathematics test, 72 or 22.6% passed and 10 or 3.1% failed. Fifty-nine or 18.5% of students with the lower GPAs passed the Writing test, while 23 or 7.2% failed.

Table I

FREQUENCY AND PERCENTAGE DISTRIBUTION OF STUDENTS' PERFORMANCE ON THE PPST READING, PPST MATHEMATICS, AND PPST WRITING

SCORE	PPST READING		PPST MATHEMATICS		PPST WRITING	
190	3	(.7)	8	(2.0)	0	(.0)
189	7	(1.7)	14	(3.5)	0	(.0)
188	10	(2.5)	14	(3.5)	2	(.5)
187	12	(3.0)	14	(3.5)	1	(.2)
186	18	(4.5)	18	(4.5)	6	(1.5)
185	16	(4.0)	0	(.0)	8	(2.0)
184	18	(4.5)	24	(6.0)	9	(2.2)
183	17	(4.2)	22	(5.5)	5	(1.2)
182	21	(5.2)	14	(3.5)	26	(6.5)
181	23	(5.7)	23	(5.7)	23	(5.7)
180	21	(5.2)	17	(4.2)	27	(6.7)
179	18	(4.5)	18	(4.5)	22	(5.5)
178	23	(5.7)	17	(4.2)	37	(9.2)
177	26	(6.5)	11	(2.7)	26	(6.5)
176	27	(6.7)	21	(5.2)	31	(7.7)
175	12	(3.0)	16	(4.0)	27	(6.7)
174	14	(3.5)	11	(2.7)	32	(8.0)
173	12	(3.0)	8	(2.0)	19	(4.7)
172	13	(3.2)	21	(5.2)	21	(5.2)
171	13	(3.2)	17	(4.2)	10	(2.5)
170	8	(2.0)	2	(0.5)	9	(2.2)
169	7	(1.7)	9	(2.2)	1	(.2)
168	7	(1.7)	4	(1.0)	5	(1.2)
167	5	(1.2)	2	(.5)	1	(.2)
166	1	(.2)	8	(2.0)	3	(.7)
165	1	(.2)	8	(2.0)	1	(.2)
164	1	(.2)	0	(.0)	0	(.0)
163	2	(.5)	1	(.2)	1	(.2)
162	0	(.0)	3	(.7)	0	(.0)
161	0	(.0)	3	(.7)	0	(.0)
160	1	(.2)	0	(.0)	0	(.0)
M	178.7		178.5		177.1	
SD	5.9		6.9		4.4	
N	335		357		348	

Table 2

A COMPARISON OF STUDENTS PASSING AND FAILING THE PPST WITH CUMULATIVE GRADE POINT AVERAGE
(PERCENTAGE SHOWN IN PARENTHESIS)

	PPST READING		PPST MATHEMATICS		PPST WRITING		TOTALS
GPA	PASS (172+)	FAIL	PASS (171+)	FAIL	PASS (173+)	FAIL	
> 2.5	216 (67.7)	21 (6.6)	219 (68.7)	18 (5.6)	223 (69.9)	14 (4.4)	237(74.3)
≤ 2.5	66 (20.7)	16 (5.0)	72 (22.6)	10 (3.1)	59 (18.5)	23 (7.2)	82(25.7)
TOTAL	282 (88.4)	37 (11.6)	291 (91.2)	28 (5.6)	282 (88.4)	37 (11.6)	319(100)

A further analysis of the relationship of the GPA to test scores is shown in Table 3. Of 319 students, 249 or 78.1% of the students with a reported GPA passed all three parts of the PPST, and 70 or 22.0% failed one or more parts of the test. Of the 237 with the higher grade averages, 196 or 61.4% passed all parts of the test. Of those with lower grades, 53 or 16.6% passed all parts of the PPST. The passing rate for the group with higher grades is greater for those passing two parts (9.1% to 4.7%), but about the same for both grade average groups for those passing only one part of the test (3.8% to 4.4%).

A chi square formula was used to test any differences by sex in performance on the PPST. As shown in Table 4, males tended to have a slightly higner passing rate than females on the Reading and Mathematics test, and females a slightly higher rate on the writing test. On the Reading test 91% of the males passed, while 86.2% of the females passed; on the Mathematics the difference was greater with 95.3% of the males passing and 86.9% of the females passing the test. In Writing, however, females had a passing rate of 86.9% to the male rate of 78.3% passing. None of these differences achieved an acceptable level of significance.

A chi square formula was also used to test the differences among the number of students who passed and failed each part of the PPST and their ethnicity. Table 5 gives the breakdown by White, Black, Oriental-American, Mexican-American, and Foreign. The three largest ethnic groups were Whites, Mexican-Americans, and Blacks. No significant differences were detected among ethnic groups on the Reading test but Mexican-American students had a slightly higher passing rate (88.9%) than did White students (88%), while Blacks had a 72.7% passing rate on this part. On the Mathematics test White students had a 91.8% passing rate,

Table 3

NUMBER AND PERCENTAGE OF STUDENTS PASSING
ONE, TWO, OR ALL THREE PARTS OF THE PPST BY GPA

GPA	PASS THREE PARTS	PASS TWO PARTS	PASS ONE PART	TOTALS
> 2.5	196 (61.4)	29 (9.1)	12 (3.8)	237 (74.3)
≤ 2.5	53 (16.6)	15 (4.7)	14 (4.4)	82 (25.7)
TOTAL	249 (78.1)	44 (13.8)	26 (8.2)	319 (100)

Table 4

CONTINGENCY TABLE FOR STUDENTS WHO PASSED/FAILED EACH SECTION OF THE PPST BY SEX

	PPST READING		PPST MATHEMATICS		PPST WRITING	
	PASS	FAIL	PASS	FAIL	PASS	FAIL
MALE	61 (91.0)	6 (9.0)	61 (95.3)	3 (4.7)	54 (78.3)	15 (21.7)
FEMALE	249 (86.2)	40 (13.8)	246 (86.9)	37 (13.1)	246 (86.9)	37 (13.1)
	X^2 = .7605 N.S.		X^2 = 2.8244 N.S.		X^2 = 2.6557 N.S.	
	N = 356		N = 347		N = 352	

Table 5

CONTINGENCY TABLE FOR STUDENTS WHO PASSED/FAILED EACH SECTION OF THE PPST BY RACE

	PPST READING		PPST MATHEMATICS		PPST WRITING	
	PASS	FAIL	PASS	FAIL	PASS	FAIL
WHITE	256 (88.0)	35 (12.0)	258 (91.8)	23 (8.2)	257 (88.6)	33 (11.4)
BLACK	8 (72.7)	3 (27.3)	9 (69.2)	4 (30.8)	8 (66.7)	4 (33.3)
ORIENTAL AMERICAN	3 (75.0)	1 (25.0)	3 (100.0)	0 (0)	3 (75.0)	1 (25.0)
MEXICAN AMERICAN	40 (88.9)	5 (11.1)	34 (75.6)	11 (24.4)	29 (69.0)	13 (31.0)
FOREIGN	2 (50.0)	2 (50.0)	2 (50.0)	2 (50.0)	2 (66.7)	1 (33.3)
	X^2 = 7.7384 N.S.		X^2 = 21.3019, $p < .001$		X^2 = 15.7840, $p < .005$	
	N = 355		N =346		N = 351	

Mexican-Americans a 75.6% passing rate, and Blacks a 60.2% passing rate. Failing rates for Blacks and Mexican-Americans were significantly greater than for Whites in Mathematics. The passing rate for White students in Writing was 88.6%; for Mexican-Americans, 69%; and for Blacks, 66.7%. The failure rate on the Writing portion was significantly higher for the Mexican-American group than either of the other main groups.

Tables 6, 7 and 8 report the pass/fail numbers and rates by ethnicity of the students and the ethnic preponderance of the schools they attended. A majority school was defined as having more than 50% white students and a minority school as one having 50% or more non-white students. Although the numbers in some cells are small, some significant findings can be reported.

On PPST Reading, the failing rate among the three main ethnic groups was significantly greater when attendance was at a minority school. (See Table 6). The chi square of 9.82 with four degrees of freedom was significant beyond the .05 level of confidence.

When performance of the PPST Mathematics section was analyzed, similar findings were noted: That is, the failure rate of all three of these ethnic groups was greater when a minority school was attended. In the case of Mathematics, the chi square was 12.85 and significant beyond the .01 level with four degrees of freedom.

Again with Writing, the failure rate was greater for all three of these groups when the high school background was a minority school. With four degrees of freedom, a chi square of 19.54 was obtained which was beyond the .001 level of confidence.

Raw scores were used to compute a Pearson product moment correlational analysis to determine the relationship among variables in Table 9. The results indicated significant relationships among students' performance on all three parts

Table 6

PASSES/NO PASSES ON PPST READING FOR ETHNIC GROUPS WHO ATTENDED EITHER A MAJORITY OR A MINORITY HIGH SCHOOL

Ethnic Group of Students	Majority School		Minority School	
	PASS	FAIL	PASS	FAIL
WHITE	124 (79.0)	33 (21.0)	119 (71.3)	48 (28.7)
BLACK	5 (100.0)	0 (.0)	4 (33.3)	8 (66.7)
ORIENTAL AMERICAN	1 (50.0)	1 (50.0)	2 (100.0)	0 (.0)
MEXICAN AMERICAN	4 (80.0)	1 (20.0)	28 (60.9)	18 (39.1)
FOREIGN	0 (.0)	0 (.0)	2 (50.0)	2 (50.)

CHI SQUARE = 9.82

SIGNIFICANCE: $P. < .05$

Table 7

PASSES/NO PASSES ON PPST MATHEMATICS FOR ETHNIC GROUPS WHO ATTENDED EITHER A MAJORITY OR A MINORITY HIGH SCHOOL

Ethnic Group of Students	Majority School		Minority School	
	PASS	FAIL	PASS	FAIL
WHITE	131 (83.4)	26 (16.6)	127 (76.0)	40 (24.0)
BLACK	5 (100.0)	0 (.0)	4 (33.3)	8 (66.7)
ORIENTAL AMERICAN	1 (50.0)	1 (50.0)	2 (100.0)	0 (.0)
MEXICAN AMERICAN	4 (80.0)	1 (20.0)	30 (65.2)	16 (34.8)
FOREIGN	0 (.0)	0 (.0)	2 (50.0)	2 (50.)

CHI SQUARE = 12.85

SIGNIFICANCE: $P. < .01$

Table 8

PASSES/NO PASSES ON PPST WRITING FOR ETHNIC GROUPS WHO ATTENDED EITHER A MAJORITY OR A MINORITY HIGH SCHOOL

Ethnic Group of Students	Majority School		Minority School	
	PASS	FAIL	PASS	FAIL
WHITE	115 (73.2)	42 (26.8)	113 (67.7)	54 (32.3)
BLACK	5 (100.0)	0 (.0)	1 (8.3)	11 (91.7)
ORIENTAL AMERICAN	1 (50.0)	1 (50.0)	2 (100.0)	0 (.0)
MEXICAN AMERICAN	4 (80.0)	1 (20.0)	25 (54.3)	21 (45.7)
FOREIGN	0 (.0)	0 (.0)	2 (50.0)	2 (50.)

CHI SQUARE = 19.54

SIGNIFICANCE: $P. < .001$

TABLE 9
CORRELATION AMONG VARIABLES

	1 DOB	2 SATV	3 SATR	4 SATVO	5 SATW	6 SATM	7 HSR	8 PPSTR	9 PPSTM	10 PPSTW	11 GPA	12 CH
1 DOB												
2 SATV	.0136											
3 SATR	.1125	.9335*										
4 SATVO	.0137	.9328*	.7495*									
5 SATW	.0390	.7198*	.6850*	.6546*								
6 SATM	.0513	.5973*	.5895*	.5157*	.5234*							
7 HSR	.0199	.3375*	.3473*	.3194*	.3262*	.3441*						
8 PPSTR	.0213	.7367*	.7032*	.6433*	.5298*	.4438*	.3655*					
9 PPSTM	.0617	.5289*	.4656*	.4390*	.4698*	.7362*	.3541*	.6334*				
10 PPSTW	.089****	.6418*	.6047*	.5710*	.7052*	.5009*	.4023*	.6584*	.5681*			
11 GPA	.0789	.2024*	.2017**	.1718****	.2071**	.2143*	.1199****	.1922*	.2191*	.2676*		
12 CH	.0499	.0235	.0573	.0751	.0326	.1211****	.1238****	.0515	.0472	.0711	-.2768*	

1 DATE OF BIRTH (DOB)
2 SAT VERBAL (SATV)
3 SAT READING SATR)
4 SAT VOCABULARY (SATVO)
5 SAT WRITING (SATW)
6 SAT MATHEMATICS (SATM)
7 HIGH SCHOOL RANK (HSR)
8 PPST READING (PPSTR)
9 PPST MATHEMATICS (PPSTM)
10 PPST WRITING (PPSTW)
11 GRADE POINT AVERAGE (GPA)
12 CUMULATIVE HOURS (CH)

* $p < .001$ ** $p < .005$ *** $p < .01$ **** $p < .05$

of the PPST and their SAT performance, high school rank, and grade point average, essentially among all measures of academic performance. Statistically significant relationships were also indicated between age and PPST Writing and, inversely, between total hours and grade average.

A multiple regression analysis was conducted for each component of the PPST. The following variables were entered into the regression equation: SAT Reading, SAT Verbal, SAT Vocabulary, SAT Writing, SAT Mathematics, ACT English, ACT Mathematics, ACT Social Sciences, ACT Natural Sciences, High School Rank, Grade Point Average, and Cumulative Hours. The strongest predictor of the PPST Reading was the SAT Verbal score, with a multiple R of .750. The strongest predictor for the PPST Mathematics was SAT Mathematics, with a multiple R of .800. ACT English was found to be the strongest predictor for PPST Writing, with a multiple R of .841. The multiple regression procedure yielded a significant second step for the PPST Writing with a multiple R of .893 for SAT Reading.

A second regression analysis was computed using the same set of variables except for the deletion of the ACT. The strongest predictor of the PPST Reading was the SAT Verbal score, with a multiple R of .776. The strongest predictor of the PPST Mathematics was SAT Mathematics, with a multiple R of .698; for step two, High School Rank indicated a strong prediction with a multiple R of .717. The multiple regression analysis for predicting the PPST Writing yielded three steps. Step one indicated that SAT Writing had a multiple R of .699. The step two variable of Grade Point Average indicated a multiple R of .783. The SAT Verbal, with a multiple R of .763, was the final step in the equation.

To further explore the role of academic variables in the prediction of success or failure on the PPST, a discriminant function analysis was employed.

The group memberships to be predicted were passing and failing the PPST. The predictor variables were those measures of academic performance and/or ability used in the multiple regression analysis reported above. Since there was no theoretical basis for ordering the entry of the variables, a stepwise analysis was used in the discriminant analysis. Table 10 shows the results of this analysis. All of the predictors reported had significant loading beyond the .0001 level of confidence as measured by Wilks Lambda.

While PPST Reading was best predicted by SAT Reading along with SAT Writing and GPA, and PPST Writing was predicted by SAT Writing in combination with GPA and SAT Reading, PPST Mathematics was predicated most efficiently by SAT Writing with GPA and SAT Reading. The predictive efficiency of these predictors is reported in Tables 11, 12 and 13 for PPST Reading, Mathematics and Writing, respectively. It should be noted that the prediction rates are from 79 to 82 percent efficiency and highly significant.

Cross tabulations were used to determine whether a relationship existed between the passing rates on the PPST and college major. Tables 14, 15 and 16 showed that students with teaching majors in English, Social Sciences and Sciences have a passing rate above 90% on all three parts of the test. While the number is small, Foreign Language majors have a 100% pass rate on Reading and Writing and an 87.5% rate on Mathematics. Those planning to teach Mathematics pass at a rate above 90% in two areas but have only an 80% passing rate in Writing. Those majoring in Elementary, Fine Arts, Physical Education and Home Economics (note, only 4 Home Economics students) all have a passing rate below 90% on all parts of the PPST. However, only the Physical Education majors display a failing percentage at a level of significance that exceeds the expected, and this is only on the Reading test. This major also approaches a significant variation on the Writing test ($p. = .0775$). The Elementary

Table 10

STRONGEST PREDICTORS FOR SUCCESS ON THE PPST (STEPWISE DISCRIMINANT FUNCTION ANALYSIS)

PPST	VARIABLE	WILKS LAMBDA	SIGNIFICANCE
Reading	SAT Reading	.851147	.0000
	SAT Writing	.838451	.0000
	Average GPA	.829808	.0000
Math	SAT Writing	.807056	.0000
	SAT Math	.764387	.0000
	SAT Reading	.758495	.0000
Writing	SAT Writing	.802045	.0000
	Average GPA	.770895	.0000
	SAT Reading	.754041	.0000

Table 11

CLASSIFICATION ANALYSIS COMPARING PREDICTED SUCCESS ON PPST READING WITH ACTUAL OBSERVED PASSES/NO PASSES

		OBSERVED		
		NO PASS	PASS	TOTAL
PREDICTED	NO PASS	10 (27.8)	10 (7.4)	20
	PASS	26 (72.2)	125 (92.6)	151
	TOTAL	36	135	171

Prediction rate- 78.95

Significance of prediction: $p < .0001$

Predictors for success on the PPST were based on the following variables: SAT Verbal, SAT Reading, SAT Vocabulary, SAT Writing, SAT Math, High School Rank, Average GPA

Table 12

CLASSIFICATION ANALYSIS COMPARING PREDICTED SUCCESS ON PPST MATHEMATICS WITH ACTUAL OBSERVED PASSES/NO PASSES

		OBSERVED		
		NO PASS	PASS	TOTAL
PREDICTED	NO PASS	15 (38.5)	11 (8.1)	26
	PASS	24 (61.5)	124 (91.9)	148
	TOTAL	39	135	174

Prediction rate- 79.89

Significance of prediction: $p < .0001$

Predictors for success on the PPST were based on the following variables: SAT Verbal, SAT Reading, SAT Vocabulary, SAT Writing, SAT Math, High School Rank, Average GPA

Table 13

CLASSIFICATION ANALYSIS COMPARING PREDICTED SUCCESS ON PPST WRITING WITH ACTUAL OBSERVED PASSES/NO PASSES

		OBSERVED		
		NO PASS	PASS	TOTAL
PREDICTED	NO PASS	13 (37.1)	9 (6.6)	23
	PASS	22 (62.9)	127 (93.4)	149
	TOTAL	35	136	172

Prediction rate- 81.87

Significance of prediction: $p < .0001$

Predictors for success on the PPST were based on the following variables: SAT Verbal, SAT Reading, SAT Vocabulary, SAT Writing, SAT Math, High School Rank, Average GPA

TABLE 14

STUDENTS WHO PASSED/FAILED THE PPST READING BY COLLEGE MAJOR

MAJOR	PASS	FAIL	TOTAL
ELEMENTARY	133 (88.1)	18 (11.9)	151 (42.3)
ENGLISH	20 (90.9)	2 (9.1)	22 (6.2)
SOCIAL SCIENCES	31 (96.9)	1 (3.1)	32 (9.0)
SCIENCE	17 (100.0)	0 (.0)	17 (4.8)
FOREIGN LANGUAGES	8 (100.0)	0 (.0)	8 (2.2)
FINE ARTS	21 (77.8)	6 (22.2)	27 (7.6)
*PHYSICAL EDUCATION	14 (63.6)	8 (36.4)	22 (6.2)
HOME ECONOMICS	2 (50.0)	2 (50.0)	4 (1.1)
MATH	13 (92.9)	1 (7.1)	14 (3.9)
OTHER	34 (89.5)	4 (10.5)	38 (10.6)
TOTAL	293	42	335

*< .005
CORRECTED CHI SQUARE = 9.3923

TABLE 15

STUDENTS WHO PASSED/FAILED THE PPST MATHEMATICS BY COLLEGE MAJOR

MAJOR	PASS	FAIL	TOTAL
**ELEMENTARY	117 (84.2)	22 (15.8)	139 (39.9)
ENGLISH	25 (96.2)	1 (3.8)	26 (7.5)
SOCIAL SCIENCES	31 (93.9)	2 (6.1)	33 (9.5)
SCIENCE	18 (100.0)	0 (.0)	18 (5.2)
FOREIGN LANGUAGES	7 (87.5)	1 (12.5)	8 (2.3)
FINE ARTS	24 (82.8)	5 (13.6)	29 (8.3)
PHYSICAL EDUCATION	19 (86.4)	3 (13.6)	22 (6.3)
HOME ECONOMICS	3 (75.0)	1 (25.0)	4 (1.1)
MATH	12 (100.0)	0 (.0)	12 (3.4)
OTHER	35 (92.1)	3 (7.9)	38 (10.9)
TOTAL	291	38	329

**Approaches significance at .05 level (.0581)
CORRECTED CHI SQUARE = 3.5918

TABLE 16

STUDENTS WHO PASSED/FAILED THE PPST WRITING BY COLLEGE MAJOR

MAJOR	PASS	FAIL	TOTAL
ELEMENTARY	120 (86.3)	19 (13.7)	139 (39.4)
ENGLISH	22 (95.7)	1 (4.3)	23 (6.5)
SOCIAL SCIENCES	29 (93.5)	2 (6.5)	31 (8.8)
SCIENCE	18 (94.7)	1 (5.3)	19 (5.4)
FOREIGN LANGUAGES	8 (100.0)	0 (.0)	8 (2.3)
FINE ARTS	23 (85.2)	4 (14.8)	27 (7.6)
**PHYSICAL EDUCATION	21 (72.4)	8 (27.6)	29 (8.2)
HOME ECONOMICS	3 (75.0)	1 (25.0)	4 (1.1)
MATH	12 (80.0)	3 (20.0)	15 (4.2)
OTHER	34 (92.9)	3 (8.1)	37 (10.5)
TOTAL	290	42	332

** Approaches significance at .05 level (.0775)
CORRECTED CHI SQUARE = 3.1167

prospective teachers approach a significantly higher failing rate than other groups in Mathematics with a chi square significance at .0581 level of significance.

Of 372 University of Texas students who received a PPST Survey Form, 96 responded. Students were asked to critique each part of the PPST by selecting one of five responses for each item on a Likert type scale (See Appendix A). The response results are shown in Table 17. A majority of the students agreed or strongly agreed that the tests fairly assessed their skills. Specifically, 68.7% believed the PPST Reading fairly assessed their reading skills; 63.2% indicated the PPST Mathematics fairly assessed their mathematics skills; and 79.2% of the students responding believed that the PPST Writing fairly assessed their writing skills.

Students were asked to indicate the amount of time spent in preparation for the PPST and to indicate the source of preparation, i.e., Learning Skills Center (a tutoring service available to students at The University of Texas at Austin), private tutoring, and/or self study. The results for each section of the PPST are reported in Tables 18, 19, and 20. Results, also, are reported for the students who passed each section and those who failed each section. It should be noted that many students used more than one source of assistance in preparation for the PPST. Although the n was small, there was some indication that students who prepared for the tests did better than those who did not, and that self study and the Learning Skills Center were the major sources of assistance in studying for the PPST.

Table 21 shows the total amount of preparation time for each section of the PPST for students who passed and for those who failed the PPST. The total amount of preparation is based on a combined total of preparation through the

Table 17

Student's Personal Critique of PPST
(Survey was conducted after students received their PPST scores)

Survey Question		Strongly Agree	Agree	Disagree	Strongly Disagree	No Opinion	
The PPST fairly assessed my competency in reading.	%:	*10.4	58.3	14.6	14.6	2.1	
	N:	10	56	14	14	2	N=96
The PPST fairly assessed my competency in mathematics.	%:	7.4	55.8	21.1	13.7	2.1	
	N:	7	53	20	13	2	N=95
The PPST fairly assessed my competency in writing.	%:	12.5	66.7	8.3	10.4	1.0	
	N:	12	65	8	10	1	N=96

Table 18

Preparation for PPST-Reading

	Pass N-26			No Pass N-3		
	Learning Skills Center	Private Tutoring	Self Study	Learning Skills Center	Private Tutoring	Self Study
10 min. - 1 hour	3	0	6	1	0	0
1:01 - 2 hours	1	0	6	1	0	0
2:01 - 3 hours	0	0	0	0	0	0
3:01-10 hours	2	0	2	0	0	0
Above 10 hours	1	0	1	0	0	0
Time not reported	0	0	9	0	0	1

Table 19

Preparation for PPST-Mathematics

	Pass N-30			No Pass N-6		
	Learning Skills Center	Private Tutoring	Self Study	Learning Skills Center	Private Tutoring	Self Study
10 min. - 1 hour	3	0	7	1	1	1
1:01 - 2 hours	1	0	6	1	0	0
2:01 - 3 hours	0	0	0	0	0	1
3:01-10 hours	2	0	3	1	0	0
Above 10 hours	1	0	3	0	0	1
Time not reported	0	0	10	0	0	2

Table 20

Preparation for PPST-Writing

	Pass N=22			No Pass N=4		
	Learning Skills Center	Private Tutoring	Self Study	Learning Skills Center	Private Tutoring	Self Study
10 min. - 1 hour	3	0	4	0	0	1
1:01 - 2 hours	1	0	4	1	0	1
2:01 - 3 hours	0	0	0	0	0	0
3:01-10 hours	1	0	1	0	0	0
Above 10 hours	0	0	0	0	0	2
Time not reported	0	0	10	0	0	0

Table 21

Pass and No Pass Students' Total Preparation Time for PPST (Learning Skills Center, Private Tutoring, and Self-Study)

N=40

	Pass			No Pass		
	Reading	Mathematics	Writing	Reading	Mathematics	Writing
10 min. - 1 hour	6	6	7	1	1	1
1:01 - 2 hours	5	5	2	1	1	1
2:01 - 3 hours	1	2	1	0	1	0
3:01 - 10 hours	4	3	2	0	1	0
Above 10 hours	2	5	0	0	0	2
Time not reported	8	10	9	1	1	0

Learning Skills Center, private tutoring, and self study. Those who studied tended to have passing scores, but most students who studied indicated they studied fewer than 10 hours and still were able to pass the tests.

Another area of interest to the investigators was the perseverance of the candidates. Forty students who did not pass one or more parts of the PPST at first attempt were identified. Not all students attempted all parts initially; hence, the numbers by trial do not display an orderly change in Table 22. For example, of the 40 cases attempting Reading, 31 passed and 1 failed the first time, another 4 made a second attempt and one of those failed. Of the remainder, two passed on a third trial, and one on the fourth attempt. Table 22, therefore, suggests that perseverance pays.

Analysis of Findings

As would be expected, students with a Grade Point Average (GPA) higher than 2.5 did better than students with a GPA equal to or below 2.5, on the individual parts of the PPST tests (Reading, Writing, and Mathematics). The students with a higher GPA also had a higher success rate for passing all three parts of the PPST (61.4% to 16.6%). More surprising is the fact that the students with lower GPA's had a lower failure rate on Reading and Mathematics than those with higher average grades A possible explanation is that among the high GPA's, there are over-achievers, students who lack test taking skills, and students whose majors require fewer verbal and mathematical skills.

Sex was a variable associated with the success rate on the PPST; males had higher scores in Reading and Mathematics, while females performed better on the Writing test. The sex group differences in success rate was greater on the Mathematics test than on the Reading test.

Table 22

Attempts Made By Students With Preparation To Pass the PPST

Attempts	1		2		3		4		
	Pass	No Pass	Pass	No Pass	Pass	No Pass	Pass	No Pass	Total
Reading	31	1	3	1	2	0	1	1	40
Mathematics	31	3	2	2	1	0	0	1	40
Writing	33	3	2	1	0	1	0	0	40

Ethnicity was another variable associated with the success rate on the PPST. The White students had a higher success rate than did Mexican-Americans and Blacks on the PPST Mathematics and Writing. In the Reading part of the PPST, however, Mexican-Americans scored slightly better than Whites. That the Mexican-Americans excelled on a verbal test is especially surprising in that English is a second language for many of this group. The passing rates in Mathematics and Writing between whites and minority students indicate that minority students do considerably less well than white students on those parts of the test.

The relationship of ethnicity to success or failure on the PPST is even more pronounced when ethnicity of the high school is considered. On all three parts of the PPST, Reading, Mathematics, and Writing, the success rate for students who attended majority high schools was significantly greater than for those who attended minority schools. Students, regardless of their ethnicity, who attend high school which have a majority of non-white students enrolled are more likely to fail the PPST than are students from schools with a majority of white students enrolled.

The strongest predictors of a student's success on the PPST, as indicated by the multiple regression analysis, were the student's SAT Mathematics scores (for PPST Mathematics), the SAT Verbal (for PPST Reading) and the ACT English scores (for PPST Writing). There was also a strong relationship between PPST performance and both High School Rank and Grade Point Average; cumulative hours was not a variable found to be significantly related to performance on the PPST.

In analyzing the efficiency of the academic variables for predicting PPST performance, certain conclusions are indicated. If only one variable could be used to predict success on the PPST, it would be the SAT verbal score,

but according to the data collected in this study, the best set of predictors of success on the PPST would be SAT scores and college grade point average. In the matter of predicting performance on the PPST, the work of Markel (1985) at the University of Cincinnati, who uses ACT data rather than SAT scores, should be noted.

The results of the College Major variable is suspect because of the small n in some majors. The higher passing rates by students in Foreign Language and Mathematics on the PPST Reading, by Foreign Language and English majors in PPST Writing, and by Mathematics and Science majors in PPST Mathematics, is of interest. The lower passing rates by students majoring in Physical Education, and Elementary Education (Mathematics) seems to suggest that certain majors may not require high level skills in the areas tested by the PPST and/or that these students may not use the cognitive skills tested to a high degree in their major.

In summary, the following variables were found to be related to performance on the PPST: sex, ethnicity, ethnic composition of the high school attended, SAT/ACT scores, high school rank, grade point average and high school size. Of these variables, the best predictors of student success on the PPST are SAT scores and grade point average.

Recommendations

As a result of the findings in this study, the following recommendations are made:

1. Identify students who are likely to fail and those who are likely to pass the Pre-Professional Skills Test, using SAT Verbal, Reading, and Mathematics Scores, High School Rank, Ethnic Composition of High School and Grade Point Average as predictors.

2. Provide remediation for students who appear to be "high risk" in one or more of the areas tested by the PPST.

3. Provide appropriate incentives and challenges to students whose predictors indicate success on the PPST.

4. Provide session(s) on Test Taking Skills for all students who will take the PPST.

5. Actively recruit students who have high scores on variables that predict success on the PPST into Teacher Education.

6. In College Majors where failure on the PPST is greatest, work with departments to help these students develop skills needed for successful performance on the PPST.

7. Disseminate information to ISD's from which prospective teachers are recruited concerning areas of strengths and weaknesses related to ethnicity which affect performance on the PPST.

8. Continue research in this area over a wider range of populations in the state and of populations in other states where the PPST is required of majors in Teacher Education.

9. Work cooperatively through Teacher Centers to continue research, share information, and develop strategies which will help solve problems related to state mandated competency tests.

By using early predictors identified in this study (i.e., SAT scores, high school rank, ethnic composition of school and GPA), institutions of higher education should be able to identify students who will likely need remediation and can encourage them to prepare for the PPST according to their needs. Colleges involved in teacher education may find these early predictors of success useful in recruiting a high quality of candidates into their programs. That is, students who are likely to be successful can be placed in courses/ programs that are challenging such as honors classes.

There is evidence that some students who display predictors of success, especially the GPA, may, in fact, fail the PPST. Therefore, sessions in test-taking skills should be available to all students entering teacher education programs. Such sessions are needed prior to a student's first attempt to pass the PPST.

There is some indication that students in certain majors have a higher success rate than students in other majors. If this is the case, teacher education departments in institutions of higher education should coordinate with those departments whose students tend to experience the most difficulty on the PPST. The departments could be helpful in encouraging students to seek remediation or, perhaps, in requiring students in their departments to demonstrate basic skills in reading, writing, and mathematics, in the content area of their majors.

High school administrators and teachers should be informed of the relationship of ethnicity to success and failure on the PPST. Minority schools should be especially aware of the need to provide a strong academic program for their graduates who plan to become teachers.

Since the population in this study was limited, additional studies using population from other institutions of higher education would be helpful in determining whether the early predictors identified in this study are applicable to other college and university populations. Finally, Teacher Centers should continue to encourage research that will help students going into teacher education to be successful in passing state mandated competency tests. Research, also, can lead to improved programs at institutions which prepare prospective teachers.

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SURVEY OF PARTICIPANTS IN THE SPRING 1985 ADMINISTRATION OF THE PRE-PROFESSIONAL SKILLS TEST (PPST)

In an effort to assist those who will take the PPST in the future, we would appreciate your responses to this questionnaire regarding your experience with the exam.

Your prompt attention to this is deeply appreciated and is certain to prove useful to other future teachers. In order for your questionnaire to be included in this study, we request that it be returned by July 12, 1985.

Please fill in and /or check the appropriate blanks and return the questionnaire in the enclosed envelope.

BACKGROUND

1. Full Name: _____
   Last First Maiden/Middle

2. Social Security Number: ___ ___ ___ - ___ ___ - ___ ___ ___ ___

3. Testing Location: _____
   Institution City State

4. High School Attended: _____
   Name City State

5. A. Certificate Sought: _____ _____
   Elementary Secondary

   B. College: _____
   (For example: Education, Fine Arts, Natural Sciences, etc.)

   C. Concentration/Teaching Fields: _____

PREPARATION FOR THE PPST

Type	Number of Sessions	Length of Sessions
6. LEARNING RESCURCE CENTER (UT):		
- Math Lab	_____	_____
- Verbal Lab	_____	_____
- College Reading Skills Lab	_____	_____

Type	Number of Sessions	Length of Sessions

7. PRIVATE TUTORING: _____
Name of Tutor/Agency

- Math _____ _____
- Reading _____ _____
- Writing _____ _____

8. SELF-STUDY:

- Math _____ _____
- Reading _____ _____
- Writing _____ _____

PERSONAL CRITIQUE

Use the following scale to indicate your response to each item.

SA Strongly Agree
A Agree
D Disagree
SD Strongly Disagree
N No Opinion

9. The PPST test fairly assessed my competency in reading.

___ ___ ___ ___ ___
SA A D SD N

10. The PPST test fairly assessed my competency in writing.

___ ___ ___ ___ ___
SA A D SD N

11. The PPST test fairly assessed my competency in mathematics.

___ ___ ___ ___ ___
SA A D SD N

12. Additional Comments: