

**A COMPARATIVE STUDY OF THE EFFECTS OF P.T.C. TRAINING
BY A.I.O.U, TEACHER TRAINING COLLEGES AND SCHOOL ON
TEACHING STYLES AND STUDENT ACHIEVEMENT IN SCIENCE
AND MATHEMATICS IN PRIMARY SCHOOLS IN PAKISTAN**

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This article¹ examines the effects of three modes of Primary Teaching Certificate(P.T.C.) training on the achievement of students in Science and Mathematics and the teaching styles of teachers, teaching classes 4 and 5 in Pakistani schools. Some of the aspects of the background of the teachers are also analyzed in relation to modes of training to establish the difference in the type of teachers served by the different types of institutions. The main purpose of the study is to see whether there are differences in achievement of students of PTC teachers trained by three different types of institutions. The second question is whether there are differences in the teaching practices of teachers trained by these different institutions. The third major concern is to see whether there are differences in the background of PTC teachers trained by these three types of institutions.

The importance of well qualified and competent teachers can not be overemphasized. With increasing realization of the importance of primary education in the entire educational system, the problem of shortage of qualified teachers in the primary school is receiving greater attention in Pakistan. At present there are three types of institutions which provide PTC training to teachers for primary schools. Allama Iqbal Open University (AIU) offers a PTC program which is based on distance

education. Colleges of Elementary Education, Teacher Training Colleges and Colleges of Education (called Training Colleges in this study) offer PTC programs on a regular basis using formal education procedures. Some secondary/high schools (called Training Schools) also offer PTC programs. The curriculum for PTC programs of training colleges and training schools is the same but the training colleges and training schools may differ in educational facilities, teacher training staff, and the background of the students entering into these two types of teacher training institutions.

In view of the great significance and need for expanding primary education both in terms of quality and numbers, it is worthwhile to compare the primary teachers trained by the three types of teachers training institutions. This study will provide insights into the effects of the training by three types of institutions on the achievement of students and teaching styles of their teachers. This analysis may help in the formulation of policy options for primary teacher education in Pakistan.

The Academy of Educational Planning and Management of the Federal Ministry of Education, Islamabad and PROJECT BRIDGES conducted a sample survey of primary schools in December, 1988 to January 1989. The purpose of the survey was to identify factors that contribute to the achievement and promotion of students in primary schools. About 11,000 children of classes IV and V were tested in Mathematics and Science using curriculum based tests developed by the Primary and Non-Formal Education Wing of

the Ministry of Education with assistance from the World Bank. About 900 teachers were interviewed using carefully pretested interview protocols and trained teams of interviewers in many subjects ranging from physical facilities of the school to their teaching practices. The sample of almost 500 schools was selected using probability sampling applied first to districts within each province of Pakistan and then to schools within districts. The four provincial capitals and the Federal District were included in the study. Each achievement test was coded with an identification number matching the identification of the teacher interview, so that the achievement of every class of the students could be related to the answers provided by the teacher of those particular students. The author of this study was coordinator of this survey for the province of Balochistan.

The preliminary analysis of the survey data indicate that the achievement of the students of classes 4 and 5 in Science and Mathematics, as measured by tests in these subjects, is positively correlated to general qualification of the teachers of these students. The academic qualification of the teacher comes out to be one of the most significant predictors of the student achievement.

The sample used in the present paper consists of teachers possessing P.T.C. from Allama Iqbal Open University (AIU) Teacher Training Colleges and Teacher Training Schools in the provinces who were present on the day of the interview. 387 of the teachers interviewed in the Sample Survey of Schools, were P.T.C. teachers. Out of these 387 P.T.C. teachers 37(9.6%) had obtained the P.T.C. from A.I.O.U and 161 (41.5%) had received their training from Training Colleges while 189(48.9%) were

Trained in teacher training schools.

The Institutions of PTC Training and Student Achievement:

In this section of the paper PTC teachers from three types of teacher training institutions are compared with each other with respect to the achievement of students in mathematics and science. Table I presents the mean achievement scores of student taught by PTC teachers trained by AIOU Training Colleges and Training Schools.

TABLE I

Comparison of P.T.C's of A.I.O.U. Training Colleges and Training Schools with respect to the Achievement of the Students taught by them

	Math 4		Math 5		Science 4		Science 5	
	Mean	Cases	Mean	Cases	Mean	Cases	Mean	Cases
Entire Population	11.83	257	12.85	243	14.10	249	16.87	249
A.I.O.U.	12.71	30	13.99	20	15.85	29	16.74	21
Taining College	12.53	110	13.01	93	14.19	107	17.20	95
Training School	10.95	117	12.55	130	13.57	113	16.66	133
Signif.	.1011		.5146		.1050		.7939	

Table I indicates that the mean scores of students taught by PTC teachers from training schools are the lowest in all the four tests. Note that these differences in Means are not statistically significant. This means that there are basically no differences in the achievement of students taught by different types of institutions.

The same lack of difference in the achievement of students with respect to institutions of PTC Training is observed in separate analysis for each province. Similarly there are no significant differences in the mean achievements scores of students taught by PTC teachers of the three types of institutions with respect to urban and rural primary schools. But some differences are found in the achievement of students of PTC teachers from three types of institutions when we examine the effects of institution separately for male and female teachers. For male teachers there was no difference in the average achievement of the students taught by P.T.C. teachers from the different institutions in all the subjects except in math 5, where teachers trained by AIOU obtained highest results and those trained by teachers training colleges were lowest. This can be seen in Table II.

Table II: Mean Achievement Scores of Students of Male PTC Teachers.

	M4	M5	S4	S5
Population	13.2644 (159)	14.3551 (148)	14.2645 (157)	17.2393 (149)
AIOU	13.8728 (16)	17.0830 (12)	16.0046 (15)	17.5404 (12)
Trg.Colg.	12.8900 (79)	13.0263 (61)	13.7709 (76)	16.5721 (60)
School	13.5737 (64)	14.9947 (76)	14.4373 (66)	17.7184 (76)
Sig.	.6947	.0110	.3232	.5110

The mean scores of students of Female PTC Teachers trained by three

types of Institutions differ significantly among the institutions. Students of the PTC teachers from training schools score significantly lower in M4, M5 and S4. In Science 5 the statistical significance is marginal. Table III present the mean achievement score of the students of female PTC Teachers.

Table III Mean Achievement Scores of Students of Female PTC Teachers

	M4 Mean/Cases	M5 Mean/Cases	S4 Mean/Cases	S5 Mean/Cases
Population	9.5239 (98)	10.4814 (95)	13.8250 (92)	16.3307 (100)
AIOU	11.4371 (14)	9.7078 (8)	15.6798 (14)	15.6191 (9)
Trg.Colg.	11.6371 (31)	10.9851 (32)	15.2174 (31)	18.3150 (34)
Trg.Schools	7.7659 (53)	9.1085 (54)	12.3616 (47)	15.2448 (57)
Sig.	.0073	.0043	.0093	.0739

On the whole there are no significant differences in achievement of students of classes IV and V in Mathematics and Science when they are taught by P.t.C. teachers trained by AIOU. Training Colleges and Training Schools. But in the case of female PTC teachers the achievement of students taught by teachers trained in training schools was lower than the achievement of students taught by teachers from AIOU or teacher training colleges in Math 4, Math 5 and Science 4, while it was marginal in the case of Science 5.

Institutions of PTC Training and Teaching Styles:

The sample survey of schools collected information on a number of classroom procedures and practices which might have been influenced by the type of training received by teachers. These practices include use of blackboard, assigning homework, teaching from the textbook in order, use of teaching kit, use of physical punishment, use of monitors and number of classes taught. One way of examining whether there are differences in the P.T.C. training from the three types of teacher training institutions is to study the differences in the classroom practices of PTC teachers trained by these institutions.

It was found that the P.T.C. teachers trained by three types of teacher training institutions did not differ among each other in the use of blackboard. Almost 100% of P.T.C. teachers use the blackboard. The use of blackboards is not related to the student achievement in some any significant way.

The practice of assigning homework is also universal among P.T.C. teachers. 99.7% of the teachers in the sample assign homework. The differences among the teachers from different institutions of P.T.C. with regard to practice of assigning homework is not significant. It was found that the practice of assigning homework, in itself is not related to the student achievement.

The percentages of P.T.C. teachers of A.I.O.U., Training Colleges and Training Schools who teach from the textbook, in order are 98%, 96.4%,

98.2% respectively. This finding shows that almost all P.T.C. teachers teach from the textbook in a sequence.

There are no differences either among the three types of teachers with regard to having or using a teaching kit as summarized in Table IV below:

Table IV: Percentages of P.T.C. Teachers of A.I.O.U, Training Colleges and Training Schools with respect to teaching kit.

	Have a Teaching Kit			Use the Teaching Kit		
Count	AIOU	Trng Colge	Trng Schl	AIOU	Trg. Colge	Trng Schl
Column Pct.						
No	18 49.5	52 34.9	8 47.0	8 47.0	44 45.8	54 53.0
Yes	18 50.5	97 65.1	120 64.4	9 53.0	53 54.2	48 47.0
Sig.	.2429			.5804		

P.T.C. teachers of AIOU and Training Colleges use or do not use the teaching kit in similar proportions. A higher percentage of P.T.C. trained in the Teacher Training Schools said that in spite of having the kit they do not use the teaching kit. These differences, however, are not statistically significant.

A higher percentage of P.T.C. Teacher from AIOU responded that they do

not use physical punishment (52.8) as compared to P.T.C. teachers from Training Colleges and Training Schools (46.8 and 43.6 respectively). This difference, however, is not statistically significant.

The use of physical punishment is not related to student achievement. The differences in the mean scores of the students when their teachers use physical punishment are not different from the mean scores of the students when teachers do not use physical punishment.

Table V presents the findings regarding the number of classes taught crosstabulated with the institution of training:

Table V. Number of Classes Taught by Different Teachers.

	Cases Col.PCT	AIOU	Training College	Training School
No. of classes				
0		2 7.4		
1		9 30.1	25 25.9	29 25.6
2		10 33.7	42 43.3	45 40.4
3		6 21.4	14 14.6	21 19.2
4			8 8.4	1 1.3
5	7.3	2	7 7.8	15 13.5
Sig.	=		.0029	

The P.T.C. teachers trained in teacher training schools tend to have a larger number of classes. The number of classes taught by a teacher does not have a significant effect on the student achievement.

Another common teaching practice in primary schools is the use of monitors. 66.7% of PTC teachers included in the sample for this study used monitors as one of their teaching practices. The percentages of PTC teachers of AIOU, training colleges and training schools who reported the use of monitors were 60.3, 61.9 and 71.9 respectively. This

difference is not statistically significant. The use of monitors in itself is not significantly related to the achievement of the students.

The teaching practices of female PTC teachers receiving training from three types of institutions were also examined separately. No differences were found among female PTC teachers of the three types of teachers training institutions with regards to teaching practices such as teaching from the textbook in sequence, assigning homework, having a teaching kit or use of teaching kit. In the case of number of classes taught by female PTC teachers, those trained by three types of institutions differed from each other. Table VI presents these findings:-

Table VI: Number of Classes taught by Female PTC Teachers.

No.of Classes	AIOU	Trg.Colg.	Trg.School
0	14.0% (2)	-	-
1	40.7% (6)	39.3% (15)	26.6% (14)
2	26.0% (4)	37.8% (14)	44.5% (23)
3	19.4% (3)	12.4% (5)	17.3% (9)
4	-	9.7% (4)	-
5	-	-	11.5 (6)
Sig.	.0026		

Table VI indicates that a larger percentage of female PTC teachers trained by AIOU take one class while a larger percentage of female teachers trained by training colleges and training schools take more than one class.

The mean achievement score of students of Female PTC teachers teaching one class is higher than those of students taught by female PTC teachers teaching more than one class, in the case Math 4 and S4. There are no significant effects of the number of classes on achievement in Math 5 and Science 5.

PTC teachers trained by AIOU, training colleges and training schools do not differ significantly with respect to teaching practices such as use of blackboard, teaching from the book in sequence, use of monitors, use of physical punishment, use of teaching kit, and practice of assigning homework. The PTC teacher both male and female from three types of institution differ with respect to the number of classes they teach.

Institution of PTC Training and Background of Teachers:

Another question addressed in this paper is whether the teachers trained by the three type of institutions differ in some respect in their background. Some background factors such as academic qualifications, teaching experience/age, practice teaching, Urban/Rural

and gender of the teacher are analyzed in order to answer this question.

Table VII presents the level of schooling of PTC teachers by institution of their training.

Table VII Level of Schooling by Institutions.

	Count AIOU Col.Pct	Trg.College	Trg.School
Primary		1 1.7	
Middle			2 1.1
Matric	20 54.8	102 63.6	164 86.8
F.A.	13 34.0	35 21.6	19 10.2
FSC	1 2.8	1 .4	
BA	3 8.4	20 12.5	4 1.9
MA		2 1.3	
Sig.	.0000		

Table VII indicates that there are proportionally more matric teachers (63.6%) among those who have received their PTC training from the training college and training schools (86.8%) while only 54.8 percent of PTC teachers trained by AIOU were matric.

When the grades/division obtained by PTC Teachers during their academic career were studied, it was found that among teachers attracted to training colleges and schools, there were proportionally larger number of I Divisioners than in AIOU. Among the teachers attracted to AIOU, however, there is a larger proportion of III Divisioners (26.4%) compared to 20.4% in training colleges and 10.1% in training schools. These differences are statistically significant.

Table VIII: Grades/Division by Institution.

	AIOU	Trg. College	Trg.School
Grade Div.			
A-B I	2 6.1	18 11.3	35 19.0
C-D II	25 67.4	110 68.3	135 70.9
E - III	9 26.6	33 20.4	19 10.1
Sig.	.0067		

Table VIII indicates that a larger percentage of persons holding better grades or division have received PTC training from training schools. The grades or divisions in the general education of PTC teachers do not have any impact on the mean achievement scores in science and mathematics of their students.

When background factors such as age and experience of PTC teachers are studied it is found that the mean age of PTC teachers trained by AIOU is 28.19 (lowest), while it is 28.82 for training colleges and 32.20 for training schools. The mean age of the sample under consideration is 30.41. These differences are statistically significant. The age of the teacher is not significantly related to the student achievement .

Similarly it was found that teachers doing PTC from AIOU are less experienced compared to those doing PTC from training colleges and training schools. The length of teaching experience is also not significantly related to student achievement.

As regards the distribution of male and female P.T.C. teachers in the three types of training institutions the difference in percentage distribution is not significant (.1908). This means that the male/Female dichotomy does not explain the difference in student achievement and/or teaching styles of P.T.C. teachers from three types of institutions. The differences in background from female teachers graduating from three types of institution were also examined but no significant differences were found.

PTC teachers trained by AIOU, training colleges and schools differ significantly in background factor such as general qualification, grades or division, age and experience. These factors, however, do not affect the student achievement.

SUMMARY, CONCLUSIONS AND IMPLICATIONS

This article tried to examine the relationship between P.T.C. training imparted by AIOU, teacher training colleges and teacher training schools and the student achievement in mathematics and Science. It also examined the impact of this training on the classroom practices of PTC teachers. The relationship between the classroom practices and the student achievement was also studied. Various aspects of the background of the PTC teachers were studied with regard to the type of institution they have attended and with respect to the effect of background on student achievement. It was found that there is no significant impact of institution of training on either the student achievement or the classroom practices of the PTC teachers. But in the case of female PTC teachers, the three types of institutions differ with respect to student achievement in M4 and M5 and S4. No differences, however, were found in the classroom practices of male and female teachers. The teachers who have received PTC training from the three types of institution differ with respect to age and experience.

It can be concluded that PTC training imparted by the three types of institutions is similar in all the institutions. The PTC training imparted by these institutions is not developing any special classroom practices or competencies which affect the student achievement. It can also be concluded that different PTC training institutions are not developing any distinctive characteristics among their graduates which could define a particular profile of graduates of each type of institution.

This study has raised some important questions. One question is what are the main objectives of PTC training programs and to what extent these objectives are being attained? Another question is what basic competencies should a good primary teacher education program attempt to develop. There is a need to thoroughly investigate the various programs of primary teacher education in relation to their impact on the classroom practices.

The quality of primary education depends largely on the quality of our primary teacher education programs.

ENDNOTE.

1. This paper was produced during the BRIDGES Training Workshop on Analysis of Survey Data which took place at the Academy of Educational Planning and Management from January 6 to February 8, 1990. The workshop was conducted by Donald Warwick and Fernando Reimers from Harvard University. Earlier drafts of this paper were discussed in the training workshop and received feedback from the instructors as well as from the participants: Ijaz Ahmad, Nawaz Ahmad, Islamuddin Baluch, M. Anwar Hussain, Syed Fazal-Qadir, Nasim Qaisrani and Ikram Qureshi. The contents of this paper are the sole responsibility of the author.

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