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## Impact Assessment of Teacher Training on Students' Learning Outcomes in Public Schools of Afghanistan

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### Abstract

Despite of enormous improvement of students' enrollment in public schools in Afghanistan after the fall of Taliban low quality education is a serious challenge due to lack of trained and qualified teachers. This study aimed at determining the impact of teacher training on changing the pupils' learning outcomes in public schools of Afghanistan. Results show that majority of both trained and non-trained teachers applied various teaching techniques while teaching to the students in the classroom that resulted in statistically significant enhancement of the students' literacy skills. Simultaneously there was no step up of their skills in numeracy and science subjects. Reasons might include lack of pedagogical knowledge and unable to provide participatory learning. On the other hand, students might often keep homework incomplete, stay absent, attend class late and become inattentive during lesson. So, both should maintain the professional behavior to bring positive impact in schools.

**Keywords:** Teacher training, Learning outcomes, BRAC, Afghanistan

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### **Introduction**

Progress in the education sector has been reported widely as one of the success stories of the national and international development efforts in Afghanistan since 2002. Enrollment in grades 1-12 increased from 3.9 million in 2004 to 6.2 million in 2008. Girls' enrolment skyrocketed from 839,000 to more than 2.2 million, bearing in mind that they were banned from schools under the Taliban government of 1996-2001, and boys' enrolment increased from 2.6 million to 3.9 million—the highest enrolment in the history of Afghanistan (World Bank 2013). However, providing quality education to the students in government schools is far away from expectation.

Teacher's academic qualification demonstrates an integral part of the competency, but statistics shows only 48% of the teachers have the minimum academic qualifications (equivalent associate degree) (UNICEF 2016). Currently only 43% of the teachers fulfill the minimum standards of teaching and the remaining 57% who have not completed the criteria of professional teachers are recruited as contact teachers in the remote areas (Pouras 2016). Other study shows approximately 68% of the teachers do not meet the minimum qualifications of completion of grade 14 in Teacher Training College (TTC). Also, half of the teachers presently employed would not be capable of passing the examinations that are given to their students.

Due to a lack of qualified teachers, many low and less qualified teachers are deployed; many of whom have not yet completed the necessary pre-service teacher training, though there are government and private teachers' training colleges in this country from where people, who are interested to become teachers in government high schools, receive both pre-service and in-service training but the quality of this training is as traditional as it ever was. Furthermore, it is poor and outdated, subject specialists are not fortified, and current short-term in-service training has only had partial influence (Azam et al 2014). A study being conducted by Safi(2014) to assess the quality of in-service training demonstrates the weakness of the teachers of the training. Majority of the students were either partly or completely unsatisfied with the teachers' quality. Training materials are not developed in compliance with the teachers' requirements and emotions. Although quality teaching is the pre-condition for having a well educated people, and training to the teachers has always held a great importance in development, the teachers in Afghanistan lack experiential learning opportunities to expand their critical thinking skills by using new methods of teaching. Also, the shortage of quality teacher training is one of the major facts which results in poor instructional quality in the classrooms. Only 22% of teachers in Afghanistan satisfy the minimum teaching standard qualification set by the Afghan Ministry of Education (Molina et al 2018).The teachers continue to emphasize dictation, rote memorization and recitation. Therefore, the students are unable to think critically, do not use logic for problem solving, do not interpret and evaluate information, and thus their self-confidence is not grown, they are not becoming self-reliant and are not sharing ideas and helping others. Literacy and numeracy test carried out with the students from grade 4 to 9 in public schools demonstrate no significant learning progression along with their grade progression (Niaz et al 2018). The reason for this is that there is no evaluation of the students by the teachers to measure how teachers achieve class objectives, as observed by Ono (2005). He further explored that it was very rare for the teacher to call on students with low academic performance in class; teachers never asked why a child got an answer wrong or considered whether it might be due to a problem with their teaching. Also teachers never put on record which students made mistakes to use as a performance reference for improving teaching methods.

On the other hand, the teachers must know the teaching and learning process and have pedagogical knowledge such as Subject Matter Knowledge (SMK) that deals with the quality and capacity of a teacher. This also relates to the effectiveness and efficiency and organization of information, conceptualization, and how he/she figures out a problem when he/she relates to the subject matter (Rohin 2013). Teachers' pedagogical knowledge especially on important subjects such as English, Mathematics and major science subjects (Physics, Chemistry, Biology) in this

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country is very poor. Students learn math, including science subjects, directly from the textbooks, which teachers also follow when teaching (ibid).

Hence, it is obvious that excellent teaching is vital to every student's success. To have maximum impact on student learning, teachers must be developed and evolved along with the different modern teaching techniques. This involves self-reflection, increased levels of meaningful feedback on instructional practice and an overall commitment to continuously refining their craft. Identifying the complex components of quality teaching is a fundamental step in supporting teachers' professional growth as well as developing a fair and reliable evaluation process. In other words, a good quality teacher can guide the learning process of children, making learning relevant and stimulating. A dedicated and well-trained teacher can provide children with the essential skills to critically analyse, challenge and improve the discriminatory attitudes or behaviour that may be present in their homes, schools and communities (Marphatia et al 2010). With keeping this views in mind BRAC (earlier known as Bangladesh Rural Advancement Committee) as an international non-government organization (NGO) contributes to this sphere particularly providing subject based training to the public school teachers who taught English, Mathematics as well as science subjects.

### **BRAC's teacher training programme**

BRAC Afghanistan provided training to the teachers in government schools in 9 provinces to strengthen skills and teaching techniques in relation to the subjects the teacher taught. The expected outcomes of the training was to provide quality education to the students in general, help colleagues (peer teacher) develop their teaching quality, maintain class discipline, provide joyful, interactive, and participatory learning to the students, use low cost materials made from locally available resources and enhance students' learning outcomes. A 15-day training (but 3-day additional for English subject) was provided to the teachers who taught mathematics, biology, physics, chemistry and English. Apart from the training teachers received guidebooks with teaching methods with subject content as well as modest stipend. They were also given 6-day refresher training after six months. Specific teaching methods taught in the training to provide quality education were classroom management and lesson planning, brain storming, lecture followed by discussion, demonstration, pair work, buzz groups, role play, group work, field trips and quick quiz including subject specific knowledge. BRAC Afghanistan requested Provincial/District Education Directorate (PED/DED) under the Ministry of Education to prepare a list of teachers, in consultation with school principals, in five respective subjects for attending the training. A considerable number of government teachers were trained by the Capacity Development Programme of BRAC as master trainers for different subjects and these master trainers trained other teachers gradually during the project life (Table 1).

**Table 1.** Number of teachers received training by gender

<b>Subject</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>
Mathematics	83	67	150
English	59	41	100
Chemistry	140	84	224
Physics	90	35	125
Biology	166	73	239
<b>Total</b>	<b>538</b>	<b>300</b>	<b>838</b>

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While there is extensive literature on teacher quality, teacher education and training, most of it focuses on emphasizing the extent of the problem, its importance, and how improvements might be developed or delivered. A few authors mention programmes that have been conducted in various countries. There is very little literature that focuses specifically on the impacts of teacher training on student's learning outcomes. Although there are some studies, most of those which have looked at impacts of teacher training (e.g. Hanushek 2011) are on developed countries. Therefore this study aimed at measuring changing status in teaching techniques used in the class to teach the lessons to the students and exploring the impact of those on the learning outcomes of the students with a focus on the aforementioned objectives of the training.

### **Methods**

Considering the objectives of the study, a quasi-experimental research design was employed, with a treatment/selected or trained and comparison group/not selected or non-trained and quantitative method was used for this study.

The study areas were Kabul, Herat, Balkh, Samangan and Baghlan where the project provided training to government school teachers. These areas were selected because of being suggested by the government officials and considering insecurity and easy access to schools and teachers. Additionally teachers in other provinces were gradually selected later on after the baseline.

A total of 188 teachers were selected for this study from 100 schools across the province. Of them 97 (male 51 and female 46) were trained and 91 (male 43 and female 48) non-trained. Teachers selected during baseline survey were re-contacted in the endline. Teachers who taught English, Biology, Chemistry, Mathematics and Physics were selected. Twenty students per school were selected from grades 7 and 8 (during baseline they were in grade 6 and 7). These two grades were chosen during baseline for two reasons: a) it would be possible to test them once again at the end of the intervention, and b) they had science subjects (if students from below grade 6 are selected they do not have science subject). Besides, the selection of upper grades might be challenging as students might drop out or leave school. And, there were some schools where there were no 9 or above grades.

Early Grade Reading Assessment (EGRA) and Early Grade Mathematics Assessment (EGMA) and Trend in International Mathematics and Science Study (TIMSS) were used to test the students. Total number of students tested was 1,938, of which 970 (500 boy and 470 girl) were from the intervention group and 968 (468 boy and 500 girl) from the comparison group.

Data were collected from the teachers using structured questionnaires, who were trained by BRAC, in the respective schools. Similar tools were also used for non-trained teachers.

In the literacy assessment there were four subtasks: identification of alphabet, invented non-word reading, oral reading and reading comprehension which are known here as EGRA1, EGRA2, EGRA3 and EGRA4. On the other hand, there were six subtasks of numeracy assessment: number identification, quantity discrimination, missing number identification, addition, subtraction and written exercise, which are known as EGMA1 EGMA2 EGMA3 EGMA4 EGMA5 and EGMA6. Both EGRA and EGMA were time-bound tests and each subtask was completed by a student within one minute. This is a test which started from easiest subtask to difficult subtask. The science test included multiple choice questions concerning physics, chemistry and biology.

For each subtask there are scores which reveals the status of literacy and numeracy skills of the students' after the test. For reaching overall literacy and numeracy skills the students' scores in each subtask were summed up and expressed as percentages. Students' average scores out of maximum scores determine the level of skills in each subtask. Overall performance of the students was expressed by averaging all subtasks. Besides, difference in difference (diff-in-diff) technique was used to estimate the impact of training on learning outcomes after the

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interventions.

**Results**

Results focus on teachers' professional background, teaching techniques used by the teachers while teaching and its impact on students' learning outcomes: literacy, numeracy and science subjects' skills. The surveyed schools where the teachers taught had more than 2 shifts and average number of sections in grade 7 and 8 of those schools were more than three.

The teaching experience of the targeted teachers up to data collection period was higher than their teaching duration in the current schools. A little less than half of the targeted teacher was reported to have pre-service training which was lower than the number of non-trained teacher had. Higher number of trained teacher had in-service training than the non-trained teachers. Also, higher number of teachers received training on mathematics compared to chemistry, physics, English and biology. Besides, most of the schools had the option of result card to make comments on the students' performance but there was difference in the case of informing guardian to sign the report card that the students completed homework.

**Teaching techniques used by the teacher**

This section reveals the comparison between trained and non-trained teachers as to how frequently – always, sometimes or never - employs various teaching techniques as listed in the Table 2 during baseline and endline survey and the teachers who always used those techniques for making the students understand the lessons were taken into consideration in the findings.

**Table 2.** Percentage of teachers used teaching techniques to teach the lesson

Teaching technique	Baseline			Endline		
	Trained	Non-trained	P	Trained	Non-trained	P
Work in pairs or group	100	100	.001	100	96.0	.04
Use role play	87.0	65.0	.03	92.0	90.0	NS
Do quick quiz	100	96.0	NS	98.0	99.0	NS
Use blackboard	99.0	99.0	NS	100	100	NS
Ask to use blackboard	98.0	98.0	.08	100	98.0	NS
Use of instruments	88.0	88.0	NS	89.0	94.0	NS
Give homework	100	99.0	NS	100	100	NS
Check homework	83.0	92.0	.07	97.0	93.0	NS
Read and explain graph	77.0	67.0	NS	91.0	90.0	NS
Teach formulas	91.0	93.0	NS	94.0	88.0	NS
Exam, puzzle test	85.0	67.0	.007	91.0	92.0	NS

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Teach the whole class	99.0	90.0	.007	88.0	92.0	NS
Teach in small group	85.0	83.0	NS	91.0	94.0	NS
Teach by questioning	99.0	95.0	NS	99.0	95.0	NS

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Analysis of the interviews being conducted with the trained and non-trained teachers demonstrates, when asked, almost all of the teachers both trained and non-trained reported to have always prepared lesson plan but not all of them shared the plan with the students in the previous class. However the higher number of trained teachers compared to non-trained teachers shared the plan with the students in the previous class. A little higher number of trained teachers always used the teaching techniques in the class to make the lesson understand to the students.

Among other techniques 'work in pair/group' 'ask students to use blackboard', 'give homework and check homework randomly, use locally available materials to teach were reported as teaching techniques that were generally used often in the class. Overwhelming number of both trained and non-trained teacher used those techniques but a little higher number of the trained teacher always used 'pair or group work for the students', questioning and answering in the class to make the students understand of the lesson while teaching in class. Quick quiz is a recognized technique through which it is possible to comprehend about whether students realized the lesson what the teacher was teaching. Findings reveal almost all of the teachers used this technique.

Variation in employing of teaching techniques, based on gender, was found, meaning a little higher number of female teachers compared to male always used most of the techniques. However, give homework to the students, use blackboard more often were the techniques used by all of the teachers in endline. But there was no statistically significant difference between male and female in using most of the techniques (Annex 1). Check homework as technique was found different between male and female in baseline but after intervention there was no statistically significant differences including similar findings was observed for other techniques (Annex 2).

### **Students' literacy, numeracy and science skills**

The literacy and numeracy skills of the students in grade 7 and 8 were measured with a view to connecting the application of the impact of the useful and modern teaching techniques that were used by the teachers. English version of Early Grade Reading Assessment (EGRA) was used to test the students' literacy skills as the teacher was provided training on English subject. Besides, Early Grade of Mathematics Assessment (EGMA) was used to determine the status of improvement of numeracy skills of the students as a result of teaching techniques used by the teacher. The literacy and numeracy skills were compared between students under trained and non-trained teachers of baseline and endline.

For EGRA students were asked to go through the alphabet, non-word, passage reading, and reading comprehension within 60 seconds written on stimuli and interviewers were also asked to clearly mark any incorrect letter with a slash (/) to count self-corrections as correct but if self-corrected letter as incorrect, to circle (Ø). Besides this, if the children stopped for 3 seconds, the letter was skipped but if they did not provide a single correct response on the first line (5 items) then the test was discontinued. A similar process was followed for the EGMA in its 6 subtasks.

Maximum scores for EGRA1 to 4 were 100, 50, 258 and 10 while for EGMA1 to 6 were 20, 10, 10, 20, 20, 16. Scores were converted into percentage for each of the sub tasks and overall scores were measured as well following similar procedures. Overall scores that are combination of all EGRA subtasks demonstrate students' literacy skills status and same as for numeracy skills.



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### **Literacy skills**

Results show that overall literacy skills of the students under trained teacher in endline increased significantly compared to the students under selected and non-trained teachers in baseline (Table 3). On the other hand, scores of students under non-trained also increased in endline from baseline. The reason might be that there were spillover effects of the techniques on the students or trained teacher also taught the students under non-trained teachers.

**Table 3.** Average percentage of students' literacy skills scores

Subtasks	Baseline			Endline			Diff in Diff
	Trained	Non-trained	P	Trained	Non-trained	P	
EGRA 1	57.83	57.30	NS	80.11	72.81	.000	6.8**
EGRA 2	35.99	38.31	NS	67.37	62.03	.000	7.2**
EGRA 3	6.64	6.49	NS	15.76	13.39	.002	1.9*
EGRA 4	4.25	4.09	NS	11.03	7.76	.000	2.0*
Mean	26.18	26.54	NS	43.45	39.12	.000	4.4***

\*\*\*p<.000, \*\*p<.001, \*p<.01

EGRA3 was reading comprehension to understand how many words a student could read per minute. In other words, reading fluency was the most important part in EGRA test. Higher the reading fluency is the better the achievement and performance will be. Findings show only 2% point increased in reading fluency after the intervention. The reason might be that duration of the intervention was only one year. However, diff-in-diff estimate clearly indicates the impact of uses of teaching techniques on improving learning outcomes. Furthermore, there was a general trend in changing scores of EGRA1 to EGRA4, meaning that higher scores in easiest part to lower scores in hardest part.

Girl students of endline grade 7 and 8 scored higher in overall literacy test compared to baseline grade 6 and 7. Students belonging to Hazara ethnicity had been able to enhance the skills after the intervention. Variation in improvement of literacy skills also was observed across province. Students of Kabul and Samangan had been able to increase the scores more than Baglan, Herat and Balkh (Table not shown).

### **Numeracy skills**

Overall numeracy skills scores in treatment under both baseline and endline did not change (Table 4). Actually the numeracy skills scores were already higher, though there were some scopes of improving the scores. On the other hand, in baseline the comparison group scores improved a bit in endline survey. Across subtasks the students' numeracy skills scores of identification of number, finding missing number and greater or smaller number increased in endline compared to baseline. However, diff-in-diff estimate demonstrates the students' numeracy skill scores from EGMA1 to EGMA6 declined in the endline and those were statistically significant. Besides, the lowest scores achieved by the students under both trained and non-trained teachers were in written exercise that includes 2-digit addition, subtraction, multiplication and division. Therefore, statistically significant decrease of overall scores of the numeracy took place from baseline to endline.

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**Table 4.** Average percentage of students' numeracy skills scores

Subtasks	Baseline			Endline			Diff in Diff
	Trained	Non-trained	P	Trained	Non-trained	P	
EGMA 1	91.34	87.77	.000	93.22	93.41	NS	-4.4***
EGMA 2	91.68	89.64	.000	95.06	94.82	NS	-1.4***
EGMA 3	81.98	79.21	.000	89.76	90.07	NS	-3.2***
EGMA 4	74.52	66.71	.000	71.12	74.15	.01	-10.6***
EGMA 5	97.27	61.79	.000	66.84	70.26	.07	-9.5**
EGMA 6	51.18	38.97	.000	36.43	37.97	NS	-14.0
Mean	76.33	70.62	.000	75.28	76.48	.06	-7.2***

\*\*\*p<.000, \*\*p<.001

The analysis of overall scores shows slight improvement from baseline grade 6 to 7 to endline grade 7 to 8. Similar findings were also observed for both boy and girls students from baseline to endline (Table not shown).

**Science skills test**

Science test carried out to see the impact of the trained teachers' teaching especially on science subject such as physics, chemistry and biology, demonstrates the enhancement of the students skills about science. Students were given multiple choice questions to answer 25 questions that counted '1' for correct while '0' for incorrect. Thus all scores obtained out of 25 by each student were summed to make total scores and converted into percentage.

**Table 5. Percentage of students' scores on science subject**

Variables	Baseline			Endline			Diff in Diff
	Trained	Non-trained	P	Trained	Non-trained	P	
Grade							
6 to 7	46.3	43.6	.06	59.4	57.8	Ns	.005
7 to 8	47.7	46.1	Ns	58.8	58.6	ns	-.005
Gender							
Boy	44.0	41.5	.04	54.3	56.3	ns	.041
Girls	50.5	47.7	.05	65.8	59.8	.000	-.041
<b>Mean</b>	<b>52.9</b>	<b>51.3</b>	<b>.01</b>	<b>59.1</b>	<b>58.2</b>	<b>.32</b>	<b>-1.4</b>



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Findings of science test shows, when scores compared between students under selected teachers in baseline and trained teachers in endline, scores increase a little but at the same time scores of the students under non-trained teachers in endline increased as well (Table 5). Therefore diff-in-diff estimate reveals no statistically significant change took place in students' numeracy scores. This happened because either trained teachers taught the students who were actually considered under the non-trained teachers or there were spillover effects on non-selected students. Or there were other factors responsible for changing the scores in comparison group. As there was budget limitation non-trained teachers and students were not selected from separate school in the evaluation design. Besides, teachers education level was very low and might have difficulty to understand the pedagogical knowledge, training content or failed to implement the training properly or efficiently.

However, girl students scored higher than boy students but the scores declined in a similar rate as per the diff-in-diff estimate. When scores of science test was compared between students under selected teacher in baseline and trained in endline 13% higher scores was observed in endline. Yet, in the case of impact estimates there was no impact of teacher training on enhancing the skills on science subject.

### **Conclusion**

Teachers professional development through training on the subjects the teacher teaches and skills they achieve about the techniques to make the lessons understand can have impacts on the students' learning process as evidenced in Bangladesh, Botswana, Guatemala, Namibia and Pakistan where professional development by training contribute significantly to student learning and retention (Craig, Kraft & du Plessis, 1998). Also, a study carried out in Bangladesh shows maximum school learning improvement can be achieved if schools put more emphasis on teachers' collaboration, in-service training and classroom observation, and less emphasis on individual action enquiry (Haque et al 2011). But, the success of training depends on the efficient application of the knowledge and skills acquired in the classroom while teaching to the students. In this regard, relationship between BRAC's interventions and students' improvement was clearly noticed in this evaluation, though it was insignificant.

After this in-service training being received from BRAC teachers' uses of various techniques in the classroom were reported to have improved, though not significant in compare to non-trained teachers, particularly frequent interactions with the students, teaching whole class followed by greater use of group work, sharing lessons plan with the students. So, this evidences that all of the necessary techniques and its successful application can be seen in the classrooms of those teachers who had undergone the most systematic in-service training (Hardman 2009).

Findings also show that alongside trained teacher non-trained teachers reported to have always used almost all of the classroom techniques. The reasons behind this were that there were spillover effects of the training on the non-trained teachers, as they were selected from the same schools and this was one of the important objectives of the training programme. The trained teacher should share the experience of training with the peer. It was a positive spillover effect of the trained teachers on the non-trained. On the other hand, there might have over reporting of the techniques and gaps of the enumerators while asking about the teaching techniques to the non-trained teachers. However, the impact of this training was found significant in enhancing the literacy skills of the students after the interventions, meaning that in-service training to the teachers brought benefits for them as well for the students.

Notwithstanding the success in improving the literacy skills there were no impact found in improving scores of numeracy and science subjects as not all cases training could be successful. Different factors might be responsible for this. Firstly, from teacher side there might have lacking to manage the class discipline, teaching experience and educational qualification including lack of pedagogical knowledge, did not check homework, did not help weaker

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students and some of them used corporal punishment. All of these behaviors certainly might have an impact on students' learning scores and outcomes. Secondly, from students' side, students might often keep homework incomplete, stay absent, attend class late, become inattentive and create obstacles during lesson. So, the relationship between teachers and students should be reciprocal. Both should maintain the professional behavior to come by win-win situations.

To conclude, further research is necessary particularly with having experimental evaluation design followed by classroom observation to create a strong evidence of the impact of the teacher training on the improvement of students' learning outcomes.

**Conflict of interest: Authors do not have any conflict of interest**

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