

Dr. Muhammad Shakir*
Dr. Ishrat Siddiqua Lodhi**

RESTRUCTURING TEACHER EDUCATION: ASSESSING TEACHERS' SUBJECT KNOWLEDGE COMPETENCY FOR PROFESSIONAL CERTIFICATION

Abstract

The study was aimed to assess teachers' subject matter knowledge competencies for professional licensing. The main focus of this study was to develop teacher evaluation mechanism for secondary schools' teachers. Objectives of the study were (a) to study the national and international teacher evaluation mechanism gauging the performance of secondary school teachers; (b) to assess the secondary school teachers' subject knowledge competency based on national professional standard in Pakistan for professional certification and (c) to recommend strategies for the improvements how teachers improve their subject matter competency for professional licensing. To conduct the observational survey research, a sample of 453 participants (teachers) from six districts of Punjab was selected to observe the teachers in field directly. An observational checklist was developed on bases of prescribe levels of teacher accreditation by Policy and Planning wing of Ministry of Education, Pakistan. The collected data was analyzed with the help of software SPSS version 16 by using statistical formulas of Chi-Square, simple mean and percentage. The analysis of various levels indicated that maximum number of

* Lecturer, Department of Educational Training, The Islamia University of Bahawalpur

** Director Academics, Higher Education Commission, Islamabad

teachers were at level-0 Not Demonstrated Teacher (Certification Level) that were 57.8% of the total teachers observed. This analysis concludes that most of the teachers generally did not know about national curriculum framework. A small number of teachers have heard about curriculum frame work but did not go through document.

Keywords

Subject Knowledge, Teachers Education, Competency, Professional Certification,

Introduction

Being the foundation of human cognitive development schools in 21st century have become nerve centers, a place for teachers and students to connect with those around them and their community. Teachers in this new environment become less instructors and more orchestrators of information, giving children the ability to turn knowledge into wisdom. In order to educate in the 21st century, teachers are desired to cultivate and maintain the student's interest in the material by showing how this knowledge applies in the real world. Their role appears to try to increase their student's curiosity, which helps them to become lifelong learners. There are many skills that children need in order to be successful in the 21st century, the most important skills are: promote effective leadership, quality of teaching, ability to collaborate, critical thinking skills, oral presentation skills, written communication skills, ability to use technology, willingness to examine civic and global issue and chance to learn about new career opportunities (Peterson, 2007).

The quality of education depends to great extent on the quality of teacher and quality of teacher without having teaching skills seems

impossible. In fact, teacher is considered the top most academic and professional person in the educational pyramid (Singh, 2007). Without good teachers even the best system of education is found to fail while with good teachers the defects of the system can largely be overcome. Bhargava (2005), Agra (2005) and Sharma (2003) were of the view that the performance of students and quality of education depended upon the quality of teachers. To improve the quality of teachers, teachers must be given a professional status. Being professional, teachers are expected to use the best practices and strategies to meet challenging demand of their career, which involves imparting knowledge and developing essential skills and attitude in the students. The accomplishment of these goals in teaching is determining. They have to use the best of their abilities to achieve these outcomes and use those practices and strategies that have been found more efficient and effective. A good teacher is expected to be committed to his work and would have the ability to take initiatives (Cruickshank, 2009).

Teaching profession is a building block for all other professions. The quality of teaching shapes the future of students and prepares them to be a responsible citizen. Teachers play a central role in ensuring quality and effectiveness in learning and establishing foundation of a learned and educated society. It is said that the wealth of nation depends upon how effectively its young's minds are trained to take the various responsibilities in the society. There is a need for a greater emphasis on continuing education for teachers to meet the growing demand of teaching profession. To meet the growing demand of the teaching profession world had intended to plan for professional growth for teachers.

The concept of empowering teachers has been changed throughout the world and introduced teacher evaluation and accreditation system to assess the personal and professional competencies of teachers. For this purpose professional standards have been set to

ensure maximum quality in teaching and learning. The basic purpose of standards is to constitute the 'critical knowledge, skills and attitudes needed to perform a specific role effectively. They explain the primary components of performance rather providing a comprehensive list of responsibilities. Furthermore, they serve to specify what performance or behaviors an institution is particularly looking for. They describe what teachers need to know and do to provide relevant and valuable learning experiences for learners and groups of individuals (Cruickshank, 2009). The extent to which professional standards have been met can be assessed via performance indicators set by the authorities.

Government of Pakistan has taken an initiative to improve the quality of education through improving the quality of teacher education. It is made an important pillar of the National Educational Policy, 2010. Quality assurance requires professional standards of teacher education and an effective mechanism of accreditation of teacher education institutions and programs. The policy and planning Wing of Ministry of Education (MoE) in collaboration with the United Nations Educational Scientific and Cultural Organization (UNESCO) is implementing strengthening teacher education in Pakistan (STEP) with the financial support of the United State Agency for International Development (USAID) under STEP. Professional standards for teachers have been developed in consultation with stakeholder in all provinces. Although, the professional standards are aimed for primary level beginning teachers, these standards can be adapted and used for secondary level teachers and teacher educators.

The standards of professional knowledge, skills and dispositions are designed to: define competencies, skills and attributes deemed to be essential for teachers, guide the detailed development of pre and in-service programs of teacher education; establish policies, procedures and systems for accrediting teacher education

programs and institution offering them, assure public about the quality of their educators and educational outputs and outcomes (UNESCO, 2008). The recommended standards for evaluation of teachers' competencies are as follows:

- Subject Matter Knowledge
- Human Growth and Development
- Knowledge of Islamic/ Ethical Values/Social Life Skills
- Instructional Planning and Strategies
- Assessment
- Learning Environment
- Effective communication and proficient use of information communication technologies
- Collaboration and Partnerships
- Continuous Professional Development and Code of Conduct
- Teaching of English as a second/foreign language (ESL/EFL)

Standard based development of teachers and other educators is part of a larger international movement of quality assurance in many fields of human endeavor. Quality assurance in education analyzes with a critical perspective the factors that contribute to educational quality, monitors their presence in the system, and evaluates the impact they have on students learning (Government of Pakistan, 2009). A number of studies in the last three decades have pointed out the key issues and problems of teacher education in Pakistan. A variety of factors have been cited in the literature. Primary school teacher certification programs are relics of the 19th century normal school model. They neither provide broad general education. Further, competency is a dynamic pattern of performance. Teacher competency refers to cognitive knowledge of the teacher, which entails effects on students learning. In contrast performance falls between these concepts denoting the ability to perform according to a model of teacher (Safia, 2005).

Objectives of research study

Objectives of the study were (a) to study the national and international teacher evaluation mechanism gauging the performance of secondary school teachers; (b) to assess the secondary school teachers' subject knowledge competency based on national professional standard in Pakistan for professional certification and (c) to recommend strategies for the improvements how teachers improve their subject matter competency for professional licensing.

Research methodology

The nature of the study was descriptive and following procedure was adopted to complete this piece researcher of work. The population of the study was consisted on all the secondary school teachers of Government sector including boys and girls situated at urban and rural areas of the province of Punjab. The study was survey type on the basis of probability sampling methods (multistage cluster sampling) which according to Connolly (2007) serves as the foundation of all statistical tests. Sample was taken from the province of Punjab which was divided into three clusters Northern cluster, Central cluster and Southern cluster. From each cluster two districts were selected as a sample of the study and each was included in the study as the district (strata) were spread geographically and thus, sample was spread, large and ideally representative of the population because according to Best and Kahn (2003) in survey research the sample would be larger enough than experimental researches to represent the population. The districts (strata's) were further divided into urban and rural division and so, the study compared the six districts of Punjab Province. After determining the target population size in selected six districts, sample was calculated with the help of statistical formula at confidence level 95% (margin error 5%). The population

of secondary school teachers in the whole Province (Punjab) according to School education department, Government of Punjab, is 43200 (<http://www.schools.punjab.gov.pk/>). To conduct the observational survey of this research, a sample of 453 participants (teachers) were selected to observe them in the field directly. The size of sample was rationalized as Cohen, L., Manion, & Morrison, (2008) and Jyothi, (2007) suggest to select form the size of population i.e. if the population of a research study is 100,000 and above, the size of sample should be 384 as appropriate. However the researcher has taken 453 participants as focused sample for this research, which is slightly above to the actual suggested by Cohen, Manion, & Morrison, (2008) and Jyothi, (2007) just to maintain if any error of counting representation accuracy. The data selected from six districts of Punjab province was determined. Sample was taken from six selected districts Sargodha, Chakwal, Faisal Abad, Hafiz Abad, Lodhran and Muzaffargarh by considering the urban and rural areas of the selected sampled.

Research Instrument

The problem was explored in quantitative term because the teachers' subject knowledge competencies at secondary level could be analyzed better through the observational checklist. The researcher observed the competencies of the respondents in natural setting which they were currently demonstrating, practicing and applying during their classroom teaching. An observation sheet was developed to evaluate the effectiveness of teacher competencies at secondary level. An observational checklist was developed on bases of prescribe levels of teacher accreditation by Policy and Planning wing of Ministry of Education, Pakistan collaboration with UNESCO, is implementing Strengthening Teacher Education Program under the financial support of USAID. This Observational check list was used to evaluate the subject knowledge competencies of secondary school teachers based on

national professional standard. The parameters of observational check list were taken from the established criteria of each standard, which includes knowledge and understanding, dispositions and performance skills. This observation helped the researcher to collect the empirical evidences of their practices in the classroom teaching. Each standard was further divided according to its pre-determined factors i.e. knowledge and understanding, disposition and performance skills. The data from these observations was used to cross verify the evidences with the quantitative data from the questionnaire field by the research sample. The evidences of observations were reflected their sources of verifications that is discussed in detail in chapter three of this research e.g. teachers dairies, portfolios, lesson plans, individual conferences, peer reviews, classroom observations, , work sheets, journal entries, students' work samples, test scores, research evidences, and parents 'teachers comments etc.

Results of the study

C-1: Teacher understands the national curriculum framework, C-2: Teacher knows the basic concepts of acquiring subject knowledge. C-3Teacher understands the process of acquiring subject knowledge. C-4: Teacher understands the need to update subject knowledge.C-5: Teacher knows how to relate the subject knowledge with other discipline. C-6: Teacher facilitates students in learning by using different teaching techniques.C-7: Teacher values to make knowledge applicable in real world situation, C-8: Teacher values the diverse talents of all students to develop confidence. C-9: Teacher explains the content knowledge in multiple ways. C-10: Teacher uses inquiry tools according to the students' prior knowledge.C-11: Teacher demonstrates knowledge with practical life of the students.

Table 1. Evaluating Subject Knowledge Competencies of the Teacher

Competency	Level 0		Level 1		Level 2		Level 3		Level 4		Total		χ^2	Sig.
	f	%	f	%	f	%	F	%	f	%	f	%		
C-1	262	57.8	121	26.7	49	10.8	18	4.0	3	0.7	453	100	496.44	0.00
C-2	69	15.2	111	24.5	114	25.2	158	34.9	1	0.2	453	100	154.54	0.00
C-3	20	4.4	130	28.7	211	46.6	73	16.1	19	4.2	453	100	292.16	0.00
C-4	3	0.7	94	20.8	276	60.9	60	14.2	20	4.4	453	100	529.57	0.00
C-5	9	2.0	94	20.8	142	31.3	185	40.8	23	5.1	453	100	251.58	0.00
C-6	4	0.9	74	16.3	138	30.5	187	41.3	50	11	453	100	231.38	0.00
C-7	3	0.7	96	21.2	190	41.9	147	32.5	17	3.8	453	100	288.97	0.00
C-8	3	0.7	94	20.8	133	29.4	201	44.4	22	4.9	453	100	291.14	0.00
C-9	4	0.9	92	20.3	162	35.8	173	38.2	22	4.9	453	100	265.95	0.00
C-10	9	2.0	86	19.0	158	34.9	181	40.0	19	4.2	453	100	270.65	0.00
C-11	5	1.1	101	22.3	184	40.6	142	31.3	21	4.6	453	100	260.98	0.00
Overall	36	7.9	99	21.8	160	35.3	139	30.6	20	4.4	453	100	303.03	0.00

The first national standard of teachers' competency is related to subject knowledge. The related teachers were observed to assess their subject competency level ranging from level-0 to level-4. Each level was categories in terms of assigned parameters mentioned above. One aspect of subject knowledge was considered understanding of the national curriculum framework. This understanding when gauged through observation of teaching in classroom, a variation in understanding level was found and presented in table 1.

The analysis of various levels indicated that maximum number of teachers were at level-0 (Not Demonstrated) that were (57.8%) of the total teachers observed. This analysis indicates that majority of the teachers are generally unaware of national curriculum framework. Another aspect of standard-1 subject knowledge was teachers know the concepts of acquiring subject knowledge. Data in table indicates that (34.9%) of the total teachers demonstrated

adequate growth toward achieving standard; they know the concepts of acquiring subject knowledge. The third aspect of subject matter knowledge was related to the understanding of the process of acquiring subject knowledge. Data depicted that almost half (46.6%) of teachers were found at level-2 (Developing teacher). This analysis portrays that approximately half of the teachers understand the process of acquiring subject knowledge. Another very important element of subject matter knowledge is gauge teacher understanding about need to update subject knowledge during classroom teaching. The analysis of various levels described that majority (60.9%) of teachers are generally understands the need to update subject knowledge and they were gauged as developing teachers. Further analysis shows that most of (40.8%) teachers know how to relate the subject knowledge with other discipline/subject but they did not attained desire level of competency.

Teacher facilitates students learning by using different techniques was very important for student. Data in above reveals that most of the (41.3%) of the total teachers are usually facilitates students in learning by using different teaching techniques. Another aspect of subject matter knowledge was application of knowledge in real world situation which was considered necessary for teachers. When this competency was observed, difference was found during classroom visits. Most of the (41.9%) teachers demonstrated adequate growth toward the standard that teacher sometime value to make knowledge applicable in real world and they were at level-2. Similarly most of the 44.4% secondary school teachers generally value the diverse talents of students to develop confidence. Explaining content knowledge in multiple ways was assumed necessary for teacher as content knowledge helps to identify different opportunities to understand complex questions.

Data revealed that most of teachers teaching at secondary school were found at level-2 and level-3 (Developing teacher and proficient teacher) that were (35.8%) and (38.2%) were respectively of the total teachers observed. This analysis indicates that majority of the teachers are generally explaining the content knowledge in multiple ways. Most of the 40.0% teachers generally use appropriate inquiry tools according to the students' prior knowledge and were at level-3 (Proficient teachers) while almost the same 40.6% secondary school teachers occasionally demonstrate subject knowledge relating it with practical life of the students. Overall results of standard subject matter knowledge shows that 35.3% teachers occasionally know the basic concept of acquiring subject matter knowledge and they were at level-2 (Developing teacher) while 30.6%, 21.8% and 7.9% were found at level-3 (Proficient teacher), level-1 (Emerging teacher) and level-0 (Not demonstrated teacher) respectively.

Competency wise means of secondary school teachers

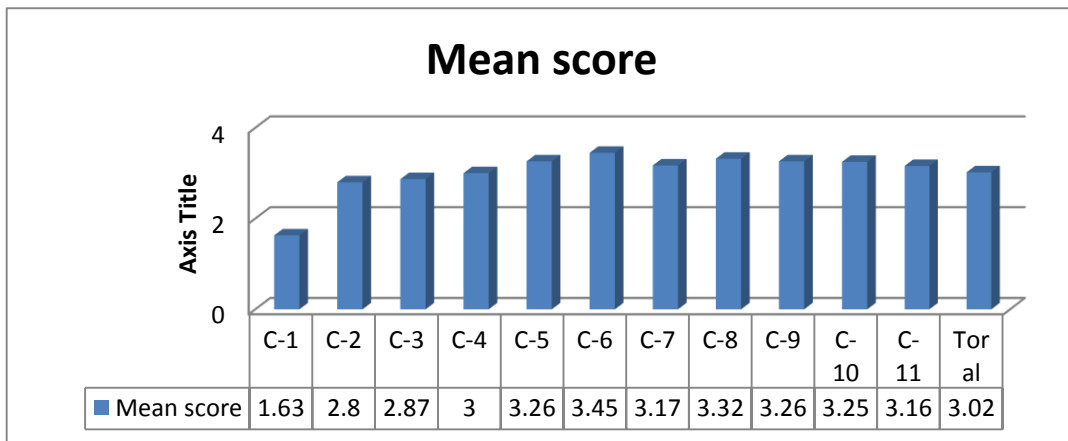
The standards wise analysis was completed according to already prescribed criteria by National Accreditation Council for Teacher Education in Pakistan. According to accreditation council criteria no standard is rated lower than 2.00, the mean score for candidate status or level 0 is $2.50 < 3.00$, level I grand mean is $3.00 < 3.50$, level II grand mean is $3.50 < 4.00$, level III grand mean is $4.00 < 4.50$ and level IV grand mean is $4.50 < 5.00$ (<http://www.pacte.pk>).

Table 1. Evaluating Subject Knowledge Competencies of the Teacher

S. No	Teaching Competency	Mean
1	Teacher understands the national curriculum framework	1.63
2	Teacher knows the basic concepts of acquiring subject knowledge.	2.80
3	Teacher understands the process of acquiring subject knowledge.	2.87
4	Teacher understands the need to update subject knowledge.	3.00
5	Teacher knows how to relate the subject knowledge with other discipline.	3.26
6	Teacher facilitates students in learning by using different teaching techniques.	3.45
7	Teacher values to make knowledge applicable in real world situation	3.17
8	Teacher values the diverse talents of all students to develop confidence.	3.32
9	Teacher explains the content knowledge in multiple ways.	3.26
10	Teacher uses inquiry tools according to the students' prior knowledge.	3.25
11	Teacher demonstrates knowledge with practical life of the students.	3.16
12	Overall standard mean	3.02

Table 2 shows the mean score of standard-1 that is related to subject matter knowledge of national professional standards for teachers. The overall mean score of the respondents in this standard was 3.02 that ranged between $3.00 < 3.50$ and this range is related to level-1 (Emerging teacher). It can be said that teachers' subject matter knowledge is related to emerging level which is one of the initial level. It is concluded that subject knowledge competency of teacher

is poor and they need to improve their subject matter knowledge to become an accomplished teacher (Level-4).



Discussion on Conceptual Framework and the Results

The first standard for professional development was to evaluate the “*subject matter knowledge*” of secondary school teachers. Results of the study show that most of the secondary school teachers did not know about the national curriculum framework while a very few teachers found having update their subject knowledge.

This appears to support the views of Safia (2005) that majority of the heads opined that most of the secondary school teachers did not have command over the content they had to teach. During classroom observation when teachers were asked the reasons why teacher did not update their subject knowledge; most of them argued that the major reason for incompetency in subject knowledge is over emphasis of work load.

As teacher has to perform various role in school e.g. election duty, population census duty, polio and many others frequently visits of District Education office. The results of the study further indicates that less than half of the secondary school teachers know how to relate subject knowledge with other discipline and were using different examples from other subjects. The overall mean score (3.02) in standard-1 *subject matter knowledge* shows that most of the teachers have partial understanding about their subject knowledge, usually they teach without updating their knowledge.

Findings and Conclusions of the Study

This research study aimed at finding out the competencies of secondary school teacher's based on national professional standards in Pakistan. Objectives were developed to determine professional competencies and relevancy of standard to the teachers' competency level in school. This is to find out how far these teaching competencies are practiced by the professionally trained teachers in government high schools. Major focus of this research paper was to gauge the attitudinal and professional competencies of secondary school teacher related to subject matter knowledge.

Findings of teaching competencies (composition of knowledge, disposition and performance and skills) show that more than half of the teachers did not know about the national curriculum framework and they were place at level-0 (Not demonstrated teacher); approximately half of the teachers were having poor concepts about how to acquire subject knowledge; similarly more than half of the teachers were having poor understanding about the process of acquiring subject knowledge while more than half of the teachers occasionally update their subject knowledge.

The findings of the study further indicates that less than half of the secondary school teachers know how to relate subject knowledge with other discipline and were using different examples from other subjects. It was measured that approximately half of the teachers almost never facilitates their students in learning by using different teaching techniques and relate the knowledge in real world situation.

Most of the teachers during classroom observation hardly value the diverse talents of all students to develop student, explaining of content knowledge in multiple ways and using appropriate inquiry tools according to the student's prior knowledge. The overall results of the standard-1 *subject matter knowledge* shows that most of the teachers have partial understanding about their subject knowledge, usually they teach without proper preparation and they were at level-1 (*Emerging teacher*).

Recommendations

- Teacher is an agent of change in education system, the development of teacher should be based on qualitative parameters instead of quantitative parameters. In teachers, a conscious effort should be made to bring about change at three levels i.e. conceptual level, pedagogical level and attitudinal level. Just focusing change simply at pedagogical level will not work if change has not occurred at the conceptual and attitudinal levels.
- A performance based teacher evaluation and compensation system is required to motivate the teachers to strive towards excellence. Promotions should be linked with teacher's capabilities rather than seniority. Additionally there should be an institutional performance appraisal system to monitor institutional accomplishment against set curricular objectives

and goals. Perhaps what is needed is setting up of a monitoring wing within each teacher training institute, under the administrative supervision of the federal regulatory body, to monitor, ensure and assist with quality control. This wing among other things would also drive the institutional management to regularly introducing new and cutting edge teaching techniques for teacher training.

- Curriculum should be made rigorous and relevant for all students and provide a balance curriculum that enhance reading, writing and numeracy skills of the students. Specific objectives should be clear and mention before each topic of the book and teacher should be trained that how learning objectives can achieved. Teachers should be trained so that they should now and can use new teaching methods to deliver subject knowledge.
- Knowledge and understanding about life skills are very important for teacher. During classroom observation most of the secondary school teachers were weak in standard human growth and development. Teachers should understand and value the diverse learning style, motivational strategies, development of critical thinking, creative thinking, problem solving skills and multiple ways of getting knowledge. Teacher training program should be arranged to develop such competencies in teachers.

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