

Exploration of Gaps between Intended and Enacted Physics Curriculum: Teachers' Professional Development Perspective

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Abstract

Teachers' professional development is the primary element of curriculum implementation. Professionally trained teachers use appropriate teaching methods, instructional materials and assessment techniques during teaching. Current study was conducted to explore gaps between intended and enacted national curriculum for physics regarding teachers' professional development for curriculum implementation. Sample of the study consisted of 361 physics teachers working in public sector secondary schools of province of Punjab by applying stratified multistage random sampling technique. Data were collected by administering self-developed questionnaire with 11 items at five-point Likert type rating scale. Reliability of questionnaire was ensured by calculating Cronbach's Alpha scores; .846. Collected data were entered in SPSS and mean, percentage, standard deviation and independent sample t-test were applied. Results showed only 34 % teachers were provided with training on curriculum implementation. Results showed no significant difference between urban and rural secondary school teachers' professional development for curriculum implementation; urban secondary schools' teachers were provided same professional development as well as rural teachers for physics curriculum implementation. Study recommends that secondary school teachers may be provided with the training for physics curriculum implementation focusing teaching methods, use of instructional materials, practical work and formative assessment techniques stated in national curriculum document 2006.

Keywords: Intended curriculum, enacted curriculum, teachers' professional development, physics curriculum

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Introduction

Curriculum is the sum of all learning experiences that learner encounters under the direction of school to achieve intended learning outcomes of education. Intended and enacted curriculums are basic types of curriculum. Intended curriculum consisted of aims, standards, benchmark, students learning outcomes, content, teaching strategies, teachers' professional development, instructional materials and assessment guidelines for different grades and subjects (Porter & Smithson, 2001; Oliva, 2005; Hirsch & Reys, 2009; Zhang & Hu, 2010). Intended curriculum in Pakistan is developed by government from primary to higher secondary level (Government of Pakistan, 2006, 2009, 2010). Enacted curriculum refers to actual use of intended curriculum in classroom practices. Teachers are real implementers of curriculum at classroom level, their professional development is essential to bridge intended curriculum guidelines with classroom practices (Bouck, 2008; Ornstein & Hunkins, 2014). Teachers' professional development is a process of enhancing teachers' professional competencies to use curriculum effectively in classroom (Whitehurst, 2002; Smith, 2005; Komba & Nkumbi, 2008). Acquisition of knowledge and skills for personal and career advancement provides opportunities for teachers to explore new roles, improve teaching strategies, redefine their practices and widen understanding about curriculum (Speck & Knipe, 2005; Komba & Nkumbi, 2008).

Curriculum policy makers, planners and practitioners have concerns about teachers' professional development for curriculum implementation. They consider teachers' professional development effective predictor for curriculum implementation that enhances teachers' content knowledge, teaching strategies, use of instructional materials and assessment techniques for teaching. It improves teachers' classroom reflective practices about students learning (Darling-Hammond & McLaughlin, 1995; McDermott, Shaffer & Constantinou, 2000; Guskey, 2002; Porter, Garet, Desimone, & Birman, 2003; Lotter, Smiley, Thompson, & Dickenson, 2016). Teachers' professional development in Pakistan is provided to enhance teachers' subject content knowledge, teaching skills, use of instructional materials, laboratory apparatus and assessment techniques for physics curriculum implementation (Government of Pakistan, 2006, 2009, 2014). Researchers explored significant relationship between teachers' professional development and teachers' classroom practices for science curriculum implementation (Supovitz, & Turner, 2000; Desimone, Porter, Garet Yoon, & Birman, 2002; Remillard & Kaye, 2002; LeFevre, 2004).

Practitioner and researchers depicted that teachers' professional development provide teachers opportunities to understand teaching learning process for curriculum implementation (Hawley & Valli, 1999; Guskey, 2002; Borich, 2003; Villegas-Reimers, 2003; Pollard, 2005; Fullan, 2007; Zakaria & Daud, 2009). Garet, Porter, Desimone,

Birman and Yoon (2001) reported that teachers involved in professional development programs for science subjects' curriculum implementation were more prepared in knowledge and teaching skills. Cohen and Hill (2001) reported that curriculum based trained teachers use instructional materials facilities effectively during teaching. Teachers' professional development influences significantly on students' classroom learning (Supovitz, 2001; Hargreaves & Fink, 2005). Teachers required professional development regarding curriculum document, professional standards for teachers, pedagogical skills, classroom management, use of audio visual aids, new textbooks and laboratory apparatus for curriculum implementation (Garet, et al., 2001; Santrock, 2006; Balan, Manko, & Phillips, 2011).

Teachers' professional development strategies, nature of activities and duration of training are positively associated with teachers' classroom practice. Training duration for teachers' professional development increases their practices capacity for curriculum implementation (Hawley & Valli, 1999; Supovitz & Turner, 2000; Porter et al., 2003; Fullan, 2007). Kennedy (1998) reported relationship between professional development contact time and students' learning in school science subjects' curriculum. Intensive, sustainable and inquiry based professional development of teachers may improve their teaching skills and practices regarding curriculum implementation (Hawley & Valli, 1999; Cohen & Hill, 2001; Supovitz, Mayer, & Kahle, 2000; Desimone, et al., 2002). Teachers' professional development enriches them to select and use appropriate teaching methods, instructional materials and assessment techniques to make learning more effective.

Teachers' professional development bridge intended and enacted curriculum during curriculum implementation (Borko, 2004). Professionally trained teachers relate subject content with students' daily life through curriculum centered teaching methods, conduct practical and use modern assessment techniques for enactment of curriculum (Fullan, 2007; Government of Pakistan, 2006; Zakaria & Daud, 2009). Spillane, Reiser and Reimer (2002) explored that curriculum implementation fail due to lack of teachers professional development. O'Sullivan (2002) revealed discrepancy between teachers' professional development and curriculum implementation. Results claimed gaps between intended curriculum and enacted curriculum regarding teachers' professional development for curriculum implementation (Cheng, Cheng, & Tang, 2010; Yan, 2012).

Objectives of the Study

The objectives of the study were;

1. To find out the gaps of teachers' professional development between intended and enacted physics curriculum.
2. To compare physics curriculum implementation in urban and rural schools.

Research Methodology

Current study was conducted to find out gaps between intended and enacted curriculum regarding teachers' professional development for curriculum implementation. Study was descriptive in nature and quantitative research design was used. Sample of the study comprised of 361 secondary school physics teachers from province of Punjab selected through stratified multistage random sampling technique. After the review of literature and focusing on the guidelines stated in national curriculum, questionnaire was developed by researcher to collect data regarding teachers' professional development for curriculum implementation. Questionnaire consisted of 11 items at Likert type five-point rating scale. Self-developed questionnaire was validated from educational experts. They omitted and added some items. Reliability of the questionnaire was assured by pilot testing on small sample of 70 teachers; 35 rural & 35 urban. Reliability was ensured by calculating Cronbach's alpha score; .846. Data were collected by ensuring ethical consideration from educational management, head teachers and secondary schools' physics teachers currently working in male public sector secondary schools of the Punjab. Collected data were entered in SPSS percentages, mean, standard deviation and independent sample t-test were calculated.

Data analysis and Interpretation

Data were analyzed in SPSS by means of statistical techniques for the sake of smooth analysis.

Table 1

Teachers' professional development for Physics curriculum implementation

Sr.	Statements	Locality				Overall	
		Urban M	SD	Rural M	SD	Mean	SD
1	Teachers were provided with the training for physics curriculum implementation	1.517	0.829	1.342	0.595	1.440	0.740
2	Teachers were provided in-service training	2.798	1.012	2.361	0.883	2.607	0.981
3	Teachers were provided with the training regarding new physics textbooks	1.690	0.910	1.449	0.736	1.584	0.846
4	Teachers were given training for the duration of one, two, three and four weeks	2.867	0.800	2.538	0.907	2.723	0.863
5	Teachers were provided with the training for pedagogical skills	1.167	0.374	1.127	0.334	1.150	0.357
6	Teachers were provided with the training on lesson planning	1.862	0.346	1.804	0.398	1.837	0.370
7	Teachers were provided with the training on classroom management	1.837	0.370	1.753	0.433	1.801	0.400

8	Teachers were provided with the training regarding professional standards for teaching	1.650	0.478	1.462	0.500	1.568	0.496
9	Teachers were provided with the training regarding use of laboratory apparatus	1.473	0.500	1.285	0.453	1.391	0.489
10	Teachers were provided with the training regarding formative assessment techniques	1.335	0.473	1.272	0.446	1.307	0.462
11	Teachers were provided with the training regarding new Physics practical	1.291	0.455	1.222	0.417	1.260	0.439
	Mean score	1.77		1.61		1.69	

Table 1 portrays that respondents have the point of view that they were provided training for implementation of national curriculum for physics 1.44, they were provide din-service training 2.61, they were provided training regarding new physics textbooks 1.58, they were given long duration training 2.72, they were provided training regarding pedagogical skills required for physics curriculum implementation 1.15, they were provided training on lesson planning 1.80, they were provided training on classroom management 1.83, they were provided training regarding professional teaching standards 1.56, they were provided training regarding use of laboratory equipment and apparatus 1.39, they have received training regarding formative assessment techniques 1.31 and they were provided training regarding new physics practical 1.26. It is concluded that professional development of urban teachers was more 1.77 than rural teachers' professional development 1.61, overall, teachers' professional development mean score was 1.69 that reflect 34% of teachers' were provided professional development for implementation of national curriculum for physics. Result shows that only 34 % teachers were provided with training for physics curriculum implementation.

Table 2

Independent sample t-test showing physics curriculum implementation in terms of teachers' locality

<i>Location</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>p</i>
Urban	203	103.488	13.353	359	3.87	0.13
Rural	158	97.823	14.372			

Interpretation of table 2 reflects no significant difference between curriculum implementation practices in terms of teachers' locality, $t(359)=3.87$, $p>.01$. Results of independent sample t-test show that urban secondary schools' teachers were provided better professional development ($M=103.488$, $SD=13.353$) as compared to rural teachers ($M=97.823$, $SD=14.372$) for physics curriculum implementation in male public sector secondary schools of the Punjab.

Discussion

Curriculum implementation documents stated that all secondary school teachers will be provided training to enhance their teaching practices regarding physics curriculum document, textbooks, teaching methods, lesson planning, classroom management, professional standards for teaching, use of laboratory apparatus, new physics practical and formative assessment techniques for physics curriculum implementation (Government of Pakistan, 2006a, 2007, 2009, 2010, 2014). Without providing long intensive and subject specific in-service training proper implementation may not occur (Fullan, 2007). Professional development supports teachers in classroom practices for successful and realistic curriculum implementation (Ekiz, 2004; Roehrig, Kruse, & Kern, 2007). Directorate of Staff Development (DSD) is the main institution aimed to enhance teachers' professional capacity of various categories of teachers & head teachers, educational managers and master trainers in Punjab in relation to revised curriculum regarding pedagogical skills, classroom management, use of new instructional materials, equipment and assessment techniques are essential for effective science curriculum implementation (DSD, 2009). Secondary school teachers' professional development focused on curriculum, integration of educational technology, use of instructional materials and assessment techniques (Parsad, Lewis, & Farris, 2001). Teachers' professional development is designed to improve teachers' content knowledge, skills, competency and practices. Pedagogical capacity of teachers to use current national curriculum is not align with teachers' professional development (UNESCO & ITA, 2013). Present study showed that there exist 66 % gaps between intended and enacted physics curriculum for teachers' professional development. Current study aligns with the findings of (Spillance et al., 2002; Yan, 2012). Present study report no significant difference between curriculum implementation in terms of teachers' locality, $t(359)=3.87, p>.01$; urban teachers were provided better professional development ($M=103.488, SD=13.353$) as compared to rural teachers ($M=97.823, SD=14.372$) for physics curriculum implementation. Teachers' professional development is not consistent with intended and enacted curriculum for curriculum implementation.

Conclusion

Professional development ensures capacity building of teachers' (Ganser, 2000). Current study was conducted to explore gaps between intended and enacted curriculum regarding teachers' professional development for curriculum implementation working in public sector secondary schools' of Punjab province. Training; content, nature, facilities, duration influences teachers' subject content knowledge, teaching methods, use of instructional materials, laboratory apparatus and assessment procedure for curriculum implementation. It is concluded that 34% teachers were provided professional development and exist between intended and enacted physics curriculum for teachers' professional development, no significant difference exist between urban and rural male secondary schools teachers professional development for curriculum implementation.

Recommendations

Study recommends that secondary school teachers working in urban and rural male secondary schools of the Punjab may be provided with the training for physics curriculum implementation on teaching methods, use of instructional materials & laboratory apparatus, practical work and formative assessment techniques stated in national curriculum document 2006.

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