



Relationship between teachers' professional development, instructional strategies and its impact on students' learning outcomes

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Abstract- This research plans to investigate the connection between school Teacher's Professional Development and effective application of newly acquired instructional strategies. To explore the in-depth information about the association between the aforementioned variables about one hundred teachers who received trainings in the schools of the metropolitan city of the country were chosen as subjects of the study. The data was collected using a survey questionnaire and interview. The results indicate that there is a positively significant relationship between professional development, instructional strategies and learning outcomes of the students.

Key words: professional development, instructional strategies, learning outcomes, learning outcomes, teachers' training, private sector schools

I. INTRODUCTION

In the contemporary era, it is essential for the teachers to abreast themselves with the latest instructional technologies to accomplish the learning of students. In-service teacher training programs are considered adequate for this purpose as they aim to provide modern pedagogical knowledge in addition to content knowledge. The signs of progress ought through these trainings influence directly and indirectly to the academic achievement of the students. Keeping in view the importance of in-service training the officials have launched many training programs in the public sector, the private sector, on the other hand, is autonomous in this regard. They either arrange training for themselves or send their teachers to teacher education institutes. Impact of training programs in the private sector on instructional strategies of teachers as well as on learning outcomes of the students is less explored. The current study is an effort to abridge this gap through empirical analysis.

To maintain a high quality of teaching-learning process, it is essential to provide continuous professional development opportunities to the teachers. It has a profound impact on bringing productive change in the teaching-learning process. The teachers benefit when they are supported by in-service training to develop their pedagogical knowledge and skills (DuFour & Marzano, 2011). The effectiveness of a teacher training program can be witnessed in the implementation of learned instructional strategies, thus improving the learning outcomes of the students. Teachers' professional development had a direct relationship with the adoption of instructional strategies for teaching-learning process. The research indicates that the teachers are influenced by ongoing professional training and that the change in their strategies as a result of this training influence on students' learning outcomes (Hammond & Moore, 2018). Adoption of effective instructional methods as a result of training support students' learning outcome through active teaching practices. The process of practicing effective teaching-learning, in turn, deal effectively with students' achievement (Filippello, Buzzai, Costa, Orecchio, & Sorrenti, 2020). The teachers apply multifarious teaching methods, which gives the opportunity to students to contribute in the learning process actively. The students gain knowledge and abilities according to the expected educational objectives (Kuh, 2008). Learning of students depends on quality of teachers (Tewari & Ilesanmi, 2020) and the essential component to maintain and enhance the quality of teacher is through continuous professional development. Keeping in view the importance of teacher's role in learning of students and quality of education, it is important for teachers to keep themselves abreast of new knowledge and skills, this is possible with training for continuous professional development (Guskey, 2014).

The professional development is not only confined to content knowledge but also focus on the improvement of teachers' attitude and pedagogical knowledge (Cohen, Raudenbush, & Ball, 2002; Hiebert

& Grouws, 2007), thus enabling them to adopt better learning strategies for better learning outcomes. In existing literature, a number of research studies can be quoted that provide evidence on the improvement of teacher's instructional knowledge in addition to content knowledge through professional development (Radford, 1998; Supovitz, Mayer, & Kahle, 2000). In a similar research study carried (Cheung, 2013) argues that teachers' professional development improves pedagogical skills in addition to knowledge and attitude towards their subject. A study carried out in local context on prospective teachers by providing them training during a teaching practicum and examining the results of that training on pedagogical skills (in addition to many other factors) also provided evidences that the training plays an important role in improving instructional strategies of teachers (Saifi, 2013). The research studies carried out in the field of professional development advocate that these training provide teachers opportunity to collaborate and share pedagogical knowledge with their colleagues thus improving the instructional strategies of the teachers for future (Covert, Peckober, Peterson, & Christiansen, 2006; Garet, Porter, Desimone, Birman, & Yoon, 2001). There are shreds of evidence supporting to the holistic approach of professional development programs, emphasizing on inclusion of both content and instructional knowledge in training. There are a few research studies that provide evidence that training on content without giving any knowledge of instructional strategy will not be effective for teachers as well as students (Guskey & Sparks, 2004).

The current study is based on three-tier assumptions, first that the teachers training in the form of continuous professional development provides content knowledge and appropriate pedagogical skills, this sequentially effect on teachers' instructional strategies opted in the classroom as a result of which better learning outcomes of the students are accomplished.

The imperative features covered during professional development programs are content knowledge, instructional knowledge, and interpersonal skills. There are research studies that provide evidence on the effectiveness of professional development programs in terms of knowledge improvement, fewer evidences are available for improvement of instructional skills as an outcome of these trainings (Kessels, 2010). The current study is intended to abridge this gap by providing empirical evidences. However, there are few studies that present importance of focusing on instructional skills. For example, Asu (2004), as cited by Rahman, Jumani, Akhter, Chisthi, and Ajmal (2011) present teaching practice at school level as part of effective learning outcome of a professional development program to improve students learning outcomes. Few other studies indicate a positive impact of training on teachers learning in terms of instructional strategies (Garet et al., 2001). Few other research studies argue in opposition for the role of training in opting instructional strategies of the teachers (Desimone, Porter, Garet, Yoon, & Birman, 2002; Freeman, O'Malley, & Eveleigh, 2014; Snow-Renner & Lauer, 2005). However, the current study is based on the assumption that the trainings have a positive influence on instructional strategies of the teachers. So, the first research question is there any relationship between instructional strategies of teachers and professional development.

Despite the obvious logical relationship between professional development of teachers and students learning outcomes, it is difficult to establish a direct connection between these two. The main hindrance is confounding factors that also play a role in improving learning outcomes of students, including environmental, administrative, social, intellectual and personal factors. However, recently the role of teachers as an agent who play significant role in better learning of students is emphasized (Carey, 2004), thus growing the need and acceptance for training of teachers in all aspects of knowledge, attitude and skills. Many research studies have been carried out keeping in view all factors as mentioned above that might influence on student's learning outcomes in addition to training only, the results indicate a positive impact of training on learning of students (Borko, 2004; Clewell, Campbell, & Perlman, 2004; Supovitz et al., 2000). Few other studies carried out by focusing only on teacher's professional development and learning achievement of the students present that the training of teachers have significant (though moderate) effect on learning outcomes of the students (McCutchen et al., 2002; Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). The important role of training of teachers to improve learning outcomes of students is presented in a recent study carried by (Akiba & Liang, 2016), providing the evidence that only hourly increase in teacher's participation in continuous professional development resulted in improved score of students. The results are also supported by many other studies carried out around the globe including the study of Solheim, Rege, and McTigue (2017) emphasizing on the importance of teachers learning and professional development for improved learning outcomes of the students. Few other studies accentuating the impact of training on learning outcomes include (Akiba & Liang, 2016; Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; Desimone et al., 2002; Fayombo, 2015; Garet et al., 2001; Ronfeldt, Farmer, McQueen, & Grissom, 2015; Slotnik & Smith, 2008;

Vermunt, 2014; Vescio, Ross, & Adams, 2008). The current study is based on the assumption that the professional development of teachers has a positive and significant effect on learning outcomes of the students. It leads towards the second research question of the study stating is there any relationship between professional development and learning outcomes of the students.

From the above discussion it is an established fact that professional development plays a vital role in refining instructional skills of teachers. It is also seemingly established that the instructional strategies of teachers play a crucial role in better learning outcomes of the students. However, there might be an area of focus to identify the relationship between these three variables, focusing on the predictive role of instructional skills between professional development and learning outcomes of the students. There are few studies in the literature that support the argument, presenting that the professional development of teachers provides them with an opportunity to refine instructional strategies that in turn effect on learning outcomes of students positively (Akiba & Liang, 2016; Darling-Hammond et al., 2009; Desimone et al., 2002). So, the third assumption of the study is to identify the moderating role of professional development between the instructional strategies of teachers and the learning outcomes of the students. This assumption lead towards the third research question stating that does the professional development play moderating role between learning outcomes and instructional strategies.

II. MATERIALS AND METHODS

The survey research method was used to accomplish the target of the study i.e., identifying the relationship between professional development, instructional strategies and learning outcomes of the students. The professional development and instructional strategies were taken as an independent variable while the learning outcome of students was taken as the dependent variable.

Participants

The purposive sampling technique was used to choose a sample of the study, and only those teachers were made part of the study which has already received Comprehensive Pedagogical Training. The reason to choose only these teachers was that they had acquired the required teaching competencies as a result of training and are now able to support students' learning through newly learned instructional strategies (Avalos, 2011). One hundred teachers from two schools of a private sector school chain participated in this study. The reason to choose this chain of schools is their intensive professional development training programs that focus on content and particularly on the instructional skills of the teachers. The wider gap can be seen between male and female participants, the total cluster of the primary section was selected for participation in the study, and there was only this number of male teachers available. The reason for this wider gap lies in a cultural context where a little number of male individuals join the teaching profession, particularly at the primary level in general and in the private sector in particular. The permission was requested from higher authorities before approaching to the participants. The following table indicate sample of the study.

Table 1. Breakdown of the participants of the Study

Schools	Teachers Male	Teachers Female
School 1	7	45
School 2	1	47
Total	8	92

Measures

In order to collect data, a self-developed instrument was used; this was comprised of two parts. Part one of the instrument was about gathering information regarding demographic variables. In contrast, the second part of the instrument was composed of two sections with statements on professional development (19 items), instructional strategies (18 items) on a five-point Likert scale.

The instrument was based on the theoretical foundations of the study, and all the factors were driven from literature. The validity of the instrument was established by expert opinion from five experts. In addition to this construct validity was ensured by running confirmatory factor analysis. The reliability of the instrument was established via Cronbach alpha that was .81. of the whole instrument while the

reliability of each factor was instructional strategies (.826), professional development (.816) and learning outcomes (.811).

Student learning outcomes were identified through document analysis, for this purpose, the framework for document analysis as well as its rubrics were developed and scores were calculated. This instrument was based on theoretical foundations found in the literature, the instrument was validated through expert opinion.

III. RESULTS AND DISCUSSION

A correlation test was run to examine the relationship between three variables including professional development, instructional strategies and learning outcomes.

Table 2. Results for Correlation between professional development, instructional strategies and learning outcomes

Variables		Inst.Strat.	Prof.Devp.	Learn.Out	Mean	SD	%
Instructional Strategies	Pearson Correlation	1	.737**	.579**	4.00	.918	82
	Sig. (2-tailed)		.000	.000			
	N	100	100	100			
Professional Development	Pearson Correlation	.737**	1	.687**	4.10	.902	82
	Sig. (2-tailed)	.000		.000			
	N	100	100	100			
Student's Learning Outcome	Pearson Correlation	.579**	.687**	1	4.23	.789	84
	Sig. (2-tailed)	.000	.000				
	N	100	100	100			

** . Correlation is significant at the 0.01 level (2-tailed).

The value for their correlation coefficient is .737, indicates that there is a strong positive correlation between variable instructional strategies of teachers and variable professional development of teachers. The value $P = .000$ also shows that there is a significant correlation between instructional strategies of teachers and variable professional development of teachers. This result is further confirmed by 82% of teachers who confirm that the development of professional competence had positively strengthened their instructional strategies. The Pearson Correlation value of .579 specifies a robust positive correlation between variable professional development of teachers and variable students' learning outcome. P value = .000 confirms that there is significant correlation between the teachers' professional development and variable students' learning outcome. The table 2 indicates the development of professional competence had a strong positive impact on students' achievement. 82% of teachers confirmed that the development of teachers' professional competence had a secure link with the learning outcome of students.

The Pearson Correlation value of .579 indicates that there is a strong positive correlation between instructional strategies and students' learning outcome. P value = .000 approves that there is a significant correlation between the teachers' instructional strategies and it is strongly linked with the students' academic learning outcome. 84% of the teachers confirmed that teachers' instructional strategies had a strong positive link with the students' learning outcome.

The regression test was carried out to investigate the relationship between the professional development (Predictor) of teachers and the implementation of knowledge and skills during teaching (Independent Variable).

Table 3. Relationship between the professional development of teachers and the implementation of knowledge and skills during teaching

Variable	R	R Square	Sig.	Mean	SD	%	Total No
Professional Development	.737	.542	.000	4.10	.902	82	100

The R-value of .737 in table 3 indicates a high degree of positive correlation between the predictor professional development of teachers and independent variable instructional strategies used by the teachers. The score shows that attending courses of pedagogical training changes the instructional strategies, and that their development is productive. The R square value .542 which show moderate model fitness. The P-value = .000, which indicates a statistically significant relationship between the independent variable professional development and dependent variable teachers' instructional strategies. 82% of teachers indicated that the professional development of teachers has a significant association with the change in instructional strategies of teachers.

The table 4 on the other hand present regression analysis to identify the factors influencing teachers' and school heads' insights about effective professional development (predictors) and its impact on learning outcome (dependent) of students.

Table 4. Relationship between the factors influencing teachers' and school heads' insights about effective professional development and its impact on academic achievement of students.

Variable	R	R Square	Sig.	Mean	SD	%	Total No
Professional Development	.687	.472	.000	4.11	.456	82	100

The R-value .687 indicates a strong correlation between the predictor professional development of teachers and students learning outcome. The R square value .472 which show moderate model fitness. The P-value = .000, which indicates a statistically significant connection between the independent variable professional development and dependent variable student's learning outcome. 82% of teachers reported that the professional development of teachers has a significant affiliation with the learning outcome of students.

The table 5 presents the results of regression to examine the impact of teachers' instructional strategies (predictor) on learning progression of students (dependent) through document analysis

Table 5. Relationship between teachers' instructional strategies on learning progression of students through document analysis

Variable	R	R Square	Sig.	Mean	SD	%	Total No
Instructional Strategies	.579	.336	.000	4.00	.918	84	100

The statistical value of R = .579, so there is moderate level of positive correlation between predictor teachers' instructional strategies and dependent variable students learning outcome. The value of R square = .336 which indicates model fitness is moderate. The P value of .000 shows that there is significant link between the teachers' instructional strategies and students' academic achievement.

As the statistical analysis here indicates, there is a significant correlation between instructional strategies and the professional development of teachers. The positive modifications in behavior and attitudes in teachers are clearly evident when they employ new instructional strategies instead of traditional methods, all in the interest of enhancing students' learning. The results also specify a strong positive correlation and effect between teachers' professional development and students' academic achievement. Statistical examination also revealed a strong and significant association between improved instructional practices from teachers and students' academic competences.

A regression test was also applied to get more valid and reliable answers to the research questions. The statistical test scores clearly specified that 82% of the teachers confirm that there is a strong association between professional development and productive change in instructional methods implemented by the teachers in the classroom. The result also endorsed that effective pedagogical knowledge improvement influences students' acquisition of knowledge and skills.

The theoretical studies reconfirm that trained and experienced teachers have a positive impact on student's learning; they have productive influence their coworkers and institute as a whole (Kini & Podolsky, 2016). The teacher's pedagogical knowledge was considered as specialized knowledge and skills for using the appropriate method for handling the content and creating an effective teaching-learning environment for the student's (Blömeke & Delaney, 2012). At present, the most commonly

known and used instructional strategies are traditional or rote learning methods of teaching students. During further training, teachers learned to use new strategies like activity-based teaching-learning, demonstrative and group work, enhancing the conceptual clarity in students. They needed guidance and training to become more cognizant of the needs and requirements of the students. The literature also confirms the teacher conducts the lesson with pro-active planning, more effective, which results in better learning outcome of students (Russell, 2001).

Moreover, when teachers planned and conducted activities during lessons in the classroom, student learning was improved in quality and conceptually. The data collected and analyzed supports the positive and substantial connection between the positive change in the instructional methods and professional development. The interpreted statistical data illuminated that professional development does have a fruitful influence on the instructional strategies, which leads to the better academic results of students. Teachers who developed themselves and gained experience were able to teach more effectively, and in turn, their students benefited from an active experience and became more self-assured learners (Darling-Hammond, 2016). Another research study on the effective teaching-learning practices and students learning confirmed that teacher's instructional method has strong impact on students learning" (DeWitt & Archer, 2015). This study also stated that teachers that have pedagogical competences can accelerate the students' learning process.

Refining the excellence of instructional strategies is one of the most determining factors in the teaching learning process of an educational institution (Hasiotis et al., 2015). Professional development activities should be a regular feature in all educational institutions – to support teachers during their occupational activities which would definitely fortify student learning.

The confirmatory results with a previous research study for a positively significant correlation indicate that the professional development not only influence on improved instructional strategies opted by teachers but also influence on students' learning outcomes. The results are also in confirmation with previous research studies that professional development plays a moderating role between the selection of instructional strategies and students learning outcomes. These positive results on the one hand provide empirical evidence from a private sector school chain where the continuous professional development is given an immense importance and is provided yearly.

IV. CONCLUSION AND RECOMMENDATIONS

This research study would be a stepping stone in the improvement and transformation of educational systems at the institutional level, which can be further developed at the provincial and national level, to bring about the modification for the better education system in Pakistan. This research study examined and explored the link between three crucial factors of transformation in any educational institution. The results confirmed that after guidelines and experience provided the ability to provide effective content knowledge and skills to students. It is evident from the results that training certification provided pedagogical competencies to teachers for better teaching learning in the classrooms. The results also affirmed that teachers with better academic result and experience exhibit more operational capabilities than their counterparts. The results also confirmed that pro-active planning, preparation, implementation and evaluation of teacher's results in better academic result of students.

Therefore, the results also indicate that the teachers used multifarious teaching strategies. The result was productive learning of students. The three primary variables – instructional practices of teachers in schools, productive professional growth, and student learning outcome – statistically affirmed the strong positive and significant relationship between each other. This study provided empirical evidence to confirm the relationship between the main three crucial factors of the educational system. The building blocks of any educational institution are the teaching practices, their pedagogical growth and students' academic progression. This can be the preliminary step in the strengthening of the educational process or system provincially and nationally. This research can contribute towards the awareness, understanding and improving transformation of the whole educational system. Moreover, these results also give a go-ahead towards exploration of a similar relationship in a larger sample of other private school chains, as this study was limited in its scope. The future research studies can focus not only in widening the sample but also on comparison of scores between public vs private sector or between multiple school chains.

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Conflict interest

The authors declare that there was no conflict interest.

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