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INDUCTION PROGRAM FOR MATHEMATICS TEACHERS: PREDICTOR OF FUTURE MODALITY OF PROFESSIONAL DEVELOPMENT IN PAKISTAN

[1]Dr. Muhammad Shabbir Ali, [2]Dr. Shafqat Rasool, [3]Dr. Asif Iqbal, [4] Sabahat Parveen

[1,3,4] University of Education, Faisalabad Campus

[2] Government College University Faisalabad

E-mail: [1]drshabbirue@yahoo.com, [4]sabahat.parveenuoe@gmail.com

Corresponding Author : [1]Dr. Muhammad Shabbir Ali, [4] Sabahat Parveen

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Abstract

Induction training program plays vital role for all new mathematics teachers who are recruited. It helps them to increase efficacy level to adhere to the educational life and facilitate the organization with effective performance. This study is the part of wider research to help to investigate evaluation of induction training program for mathematics teachers with the main objective of predicting future modality of professional development on the bases of induction training process. 150 participants, who experienced for induction training program, were selected for this study. These 150 teachers were having vast experience and background in mathematics and statistics. The data were gathered through questionnaire and observation to explore the approaches of induction program for development and its effectiveness. Data were analyzed through statistical techniques of t-test, correlation, ANOVA and regression. The analysis showed significant effect of induction training program on teachers' development as whole. Induction training program found positive relation with professionalism and strongly predict the professional development of educational organization.

Keywords: Induction Program, Professional Development, Training of Teachers, Future Modality.

I. Introduction

Induction training program is a viral with all the expertise and professional techniques of teaching (Marriam, 2001). Effectiveness of this program concerns the first impression to all the educational organizations for teachers and students as well

as (Peterson, 1990). There are multiple efforts by the Government of Pakistan to improve quality of teaching. Whether it is private or public institute, every organization knows the vital importance of induction program. The main objective of this type of program is to enhance the quality of education and ensure the quality of teaching professionalism with well-organized training sessions.

In most recent induction training is very common type of educational procedure to reinforce the teachers existing knowledge in organizational training programs (Klein & Weaver, 2000). Previous studies showed that literatures about induction programs have the benefits that are asserted but empirically it is not having been proven (Wesson &Gogus, 2005). Induction programs facilitate the personal with both tangible and financial related benefits as well as increases the emotional benefits of personal (Moscato, 2005). These programs are designed according to the objectives of national policies, procedures and equipped with improved efficacy, knowledge, skills and competencies of teachers with blended curriculum (Rossi, Lipsy, & freeman, 2004).

Organizations believe that induction training programs trained teachers(specially mathematics teachers) to achieve long terms objectives effectively. Through changing the instructional repetitive culture, it is an integral segment of education system. Though teaching is challenging profession depends upon Excellences about the way to take up responsibilities with creativity. The ground expectations are different from the academic degrees and innovative behaviors need practices, so the platform of induction training programs experienced them with satisfaction (Klein & Weaver, 2000). Bush and Middlewood (2005) argued that induction training programs facilitate the functions of educational life but critically to reach their level of Excellences and expertise. Launching of training programs whether national level or provisional, should identify the demands and needs of victorious teaching and coherent them.

This training program drafts the implementations (Golrick, 2002)of objectives to achieve them as maximum effectiveness and the teachers after the training are the valuable asset assigned classically to serve the nation. Approaches of induction training programs are highly planned, systematic, innovative, and absolute and focused to perform. Specialized and collaborative mutual group of teachers are train to approve the experiences of teaching professions in mathematic classes. Concrete benefits of induction programs including cost related benefits organizational bodies competitively integrate their teachers for training (Moscato, 2005).

Researchers investigated that past few decades pay more and more attentions to encounter the teaching environment for newcomers as they join the teaching profession.Although teaching profession typical don’t have any program to support, guide and orientations of training programs, which are known as induction training

programs (Ingersoll & Strong, 2011). Nevertheless, teaching profession characterized now an occupation with high level of attrition, creativity, innovation and course of experiences for new comingteachers. Recent studies documented that theory of induction program grips that teaching profession is complex (Ingersoll & Strong, 2011) for High School teachers to elaborate all skills and knowledge for sufficient teaching and significant proportion of acquired during job. Hence, these practices provide an environment for novices to learn and survive as successful teacher in future. The goal of induction training program is to upgrade the level of performance of teachers and retention of new teachers. Through this theory of induction an organization can perform well with enhancing teaching competencies, ultimate aim of organization, improving quality of teaching, prevent the losses of capital and develop the structure of instructional strategies (in Mathematics classes).

II. Induction training Program for teacher Development

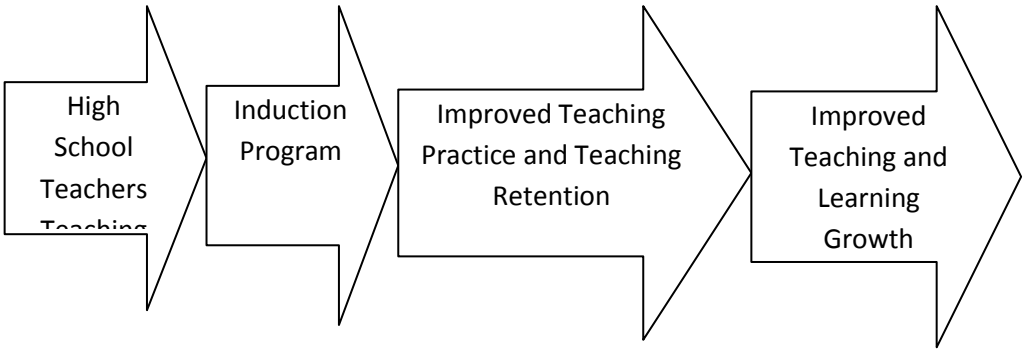

Fig.1 from Ingersoll & Strong (2011)

From the perspective of induction training program, it is a distinction between pre service teachers and in service teachers through professional programs for future development. Past researches suggested that the induction programs greatly vary at the level of national, provisional and domestic from (Ingersoll & Strong, 2011) but it is unclear to what extant induction programs effects the development of professional by settings.

It is also documented by the researchers that many teachers with strong link between perennial shortage of teachers and high rate of new teachers' attrition plague teaching. This is because educational institutes perform inadequately due to the shortage of professionalism (Ingersoll, 2001). Induction program is common even to other professions but teacher's induction training program is kind of different and conflicting (Fideler&Haselkorn, 1999).

What type of induction training program introduced to the teachers, and to what extent this program predicts the clarity of development in professional? Are the basic questions for the mentor-holders and policymakers? There are numerous

evaluation programs that examining the impact of induction programs with various outcomes such as, teachers' efficacy, competency and job satisfaction and teachers retention (Smith and Ingersoll, 2004). This study based on empirical evaluation of induction training programs as to predict the development of professional turnover. Significantly this study encourages the induction training program for the development of educational activities. Forgoing review the gape of past researchers like Lim, Lew, and Chew (2013), Peterson (1990), Marriam (2001), Klein & Weaver (2000), Wesson &Gogus (2005), Moscato (2005) this study on focused on to review the induction training modules to predict futuristic approaches of professional development.Fewer studies documented the evaluating of professional development of teaching professional on the bases of training approaches and viewpoint the issues of preparations of training points.

However, this deal of induction continues to be vital topic of attention in literature review because mathematicsSchool Teachers personal need to be trained. These programs in Pakistan are becoming precious assets in educational life to bring the potential of creating and improving organized culture. In Educational Sector Reform Action Plan of Pakistan (2001-2005) claimed that the training of school teachers is a main concern to set out quality of education and develop the maximum level of teaching professionalism. Organizations design induction training programs for teachers by itself and continuously done. Since this program launched for new recruits it is underpinning for the development of organization and their performance.

Objective of the study

The main objectives of this study were;

- To find out the effectiveness of induction training program on trained mathematic teachers.
- Explore Induction training program for mathematic teachers as predictor of future modality

Questions for Research

Forgoing considerations of the objectives of this study following questions were developed to achieve them;

1. What is the effectiveness of induction program modules regarding mathematic teachers' perception?
2. What is the relationship between induction program and professional development?
3. To what extent induction program predict the future modality of professional development of mathematic teachers?
4.

III. Research Method

The design of this study came across descriptive to explore the effectiveness of induction training program for Mathematic teachers. The aim of these processes of research to predict the development of teaching professional as future modality to evaluate induction program. This study is to explain the phenomenon induction-training program and its effectiveness with the evaluation objective of how this program achieves its outcomes to keep the futuristic prediction. The relevant data were collected through the structured questionnaire and observation. This study was delimited to the province of Pakistan, Punjab. There were 36 districts in Punjab. Here 150-sample size were randomly selected for this study, data were collected at the time of beginning of induction program and at the ending of induction program for Mathematic teachers at various district level in Punjab, other demographical information was given in table 1.

Table 1. Demographical information of participants

	Levels	Frequency	Percentage
Participants Of Induction Training Program	Male	38	74.7
	Female	112	25.3
	n	150	100.0
	High School Mathematic Teachers	60	40.0
	Junior School Mathematics Teachers	90	60.0
	N	150	100.0

The rank of teachers' designation was divided into two categories. One was High School Teachers in which from grade 9^{th} and 10^{th} mathematic classes teachers included, and Junior School Mathematic teachers categorize with from grade $1^{st}$to 8^{th} classes.

IV. Research Instrument

Questionnaire used for the participants of this study induction training program before and after training. Cronbach alpha with the values of Questionnaire $\alpha = .801$ indicated the questionnaire had high reliability. An exploratory factor analysis (EFA) was used for the sake of validity of this questionnaire. Thereafter some items were reducedfrom questionnaire with the structure of relationship between factors. Questionnaire A, 46 items were included for the inspection by EFA with the value of Bartlett's test of Sphericity Approximately Chi-Square ($X^2 = 17225.200$, $p = .011$) and Kaiser Meyer Olkin Measure .885 which are found significantly acceptable. The

researchers retrieved 32 items with the greater than 1 eigenvalue rule and the criteria of factor loading with .4 or above which accounted 51.430 of total proportion of variance. 14 items excluded, and final questionnaire consisted on 32 items with five-point Likert scale and positively correlations were found between items. Inspection of correlation matrix with coefficient .3 or above. Finally, with five point Likert scale questionnaire consisted on 32 items in 8 factors to gather the information from both participants.

V. Data Analysis

Analyses of this study were based on gathered information in relation to explain the research questions of this study statistical. At the beginning of induction training program conducted Punjab Government and at the end of the training to investigate the effectiveness of program in terms of future modality. Here researchers gone to collect the information which showed the component of the program and support to the professional development effectively.

Regression was used to analyze to what extent induction training program predict the future modality of professional development. Correlation was applied to explore the relationship between induction training program and professional development and in other statistical techniques Means, Standard Deviation, *t*-test, and ANOVA were used.

VI. Results

Table 2. Gender differences of the participants with respect to the effectiveness of induction training program in Government

	N	**Mean**	**Standard Deviation**	***t***	***p***
Male	**38**	3.1412	.45502	3.609	**.**051
Female	**112**	2.4860	.31266		

$p < .05$

Table 2 indicated the differences of the mean scores of participants on the bases of gender. It was found significantly ($p = .051$) that there is difference between the mean scores of male and female. Male teachers were better to understand the induction training program for the development of professional effectively than the female teachers.

Table 3. Differences between High School Teachers and Junior School Mathematic

Teachers on the bases of induction program for future modality perspective

Groups of participants	N	Mean	SD	*t*	*p*
High School Mathematic Teachers	**60**	3.8462	.36552	2.344	.000
Junior School Mathematic Teachers	**90**	4.3846	.59286		

It is evident in table 3. That there is difference between the perception of Junior School **Mathematic** Teachers and High School **Mathematic** Teachers regarding future modality of induction training program for professional development. So the High School **Mathematic** Teachers according to the results were perceived the induction program as effective tool lower than the Junior School **Mathematic** Teachers about this program with respect to the future modality of professional development. The mean scores of Junior School **Mathematic** Teachers were higher (M = 4.3846) than the mean scores of High School **Mathematic** Teachers in teaching profession (M = 3.8462) which is found significant *p* = .000.

Table 4. Pre and Post mean scores of participants regarding evaluating induction training program effectiveness for professional development in educational organization

		Mean	SD	t	*p*
Effectiveness of Know1edge and Ski11s	Pre-test	2.1434	1.54	6.45	.000
	Post-test	3.1651	1.34		
Effectiveness of Clarity 0f Content	Pre-test	2.1523	1.64	5.23	.000
	Post-test	3.1832	1.34		
Effectiveness of Organized Presentation	Pre-test	2.1654	1.75	6.23	.001
	Post-test	3.1823	1.23		
Effectiveness of Classroom	Pre-test	3.4533	1.34	3.45	.000

Management	Post-test	3.4522	1.65		
Effectiveness of Demonstration	Pre-test	3.2237	1.77	5.34	.000
	Post-test	3.8755	1.23		
Effectiveness of Educational Climate	Pre-test	2.3555	1.45	5.22	.000
	Post-test	3.7756	1.05		
Effectiveness of Information & Communication Technologies	Pre-test	1.4532	1.45	6.23	.002
	Post-test	3.4660	1.76		
Effectiveness of Techniques Of Job	Pre-test	2.0759	1.97	6.88	.000
	Post-test	3.6750	1.76		

$p < .005$

A questionnaire was used to gather the data from the participants at the beginning of the program and information was stored. The questionnaire again used to collect the data from the participants at the end of the induction training program. The information was stored on five-point likert scale from lowest to highest as considered to scores of participants. The data were analyzed through statistical application to found out mean of pre and post test scores. It was clearly (Table 4)showed that there is significantly ($p < .001$) differences between the mean scores on pre-test and post-test. It can be concluded that training had modified the attitude and behavior of the participants regarding this training is effective for the development of the professional. Pre-test mean scores were lower than the posttest mean scores of participants at different sessions of induction program, Clarity 0f Content, Organized Presentation, Classroom Management, Demonstration, Educational Climate, Information & Communication Technologies, Techniques of Job. At the element of Information & Communication Technologies, the difference of mean scores were higher (pre- M = 1.4532, post- M = 3.4660, $p = .002$) than other elements. Although there were minor differences at Demonstration (pre- M = 3.2237, post- M = 3.8755, p = .000) and Classroom Management (pre- M = 3.4533, post- M = 3.4522, p = .000) session.

Table 5. Comparative analysis between the elements of Induction training program for effective professional development

Elements of effective induction program		Sum of Squares	Mean Square	F (2, 158)	*p*
Know1edge And Ski11s.	Between Groups	30.147	1.073	.390	.002
	Within Groups	5380.726	0.287		
	Total	5410.873			
C1arity of C0ntent	Between Groups	1.164	.582	.657	.001
	Within Groups	82.265	.769		
	Total	83.430			
Organized The Presentati0n	Between Groups	1.096	.548	.782	.000
	Within Groups	120.482	1.137		
	Total	121.578			
Classroom Management	Between Groups	.554	.277	.443	.030
	Within Groups	31.421	.294		
	Total	31.975			
Demonstration	Between Groups	5.384	2.692	.758	.008
	Within Groups	122.136	1.141		
	Total	127.519			
Educational Climate	Between Groups	.239	.120	.479	.000
	Within Groups	71.483	.668		
	Total	71.722			
Information & Communication Technologies	Between Groups	2.260	1.130	.867	.004
	Within Groups	124.988	1.168		
	Total	127.248			
Techniques of Job	Between Groups	.551	.275	.549	.000
	Within Groups	65.611	.613		
	Total	66.162			

P < .005

In order to execute the difference between the session elements of induction program ANOVA was applied. In table 5.Indicated that there are differences among the 8 element of induction training program in terms of producing effective

professional for educational organizations. The 8 factors of induction training program were clarity of content, organized presentation, classroom management, demonstration, educational climate, information & communication technologies, and techniques of job. There were statistical differences (slightly) between the mean scores of factors of induction training program significantly except Demonstration which was found insignificant at the level of $p = .008$ as determined in the results by ANOVA.

Table 6.Relationship between induction program and professional development

Variables		**Professional Development**
Know1edge and ski11s.	r	.433
	p	.003
C1arity of content	r	.288
	p	.002
Organized The Presentati0n	r	.686
	p	.000
Classroom Management	r	.683
	p	.000
Demonstration	r	.313
	p	.001
Educational Climate	r	.251
	p	.002
Information & Communication Technologies	r	.402
	p	.000
Techniques Of Job	r	.678
	p	.002
N		160

P < .005

To found out the association between the factors of induction training program modal and development of the professional in educational environment, correlation was applied (table 5.) it was clearly showed that there was positive relation among the factors of induction training program and development of professional with the value of p < .005 which was significant.

Table 7. Effectiveness of Induction Training Program Vs Future Modality of Professional Development

Variables	Mean square	β (standard)	SE	*t*	R	R^2	F (2,148)	*p*
Predictor	3155.514	.145	1.2776	16.635	.262	.071	60.009	.001
Professional Development	35.432		.037	9.437				

P < .001

Regression technique was used to found out that to what extent induction training program predict the future modality of professional development in educational organizations. The result with the value of F = 60.009, p = .001which is high significant level. Moreover, coefficient (R^2 = .071) indicated that 71% of variance support that induction training program can predict the future modality of professional development positively (β = .145). In general, it was noticed that there is positive and strong association between induction program and professional development of teachers. The results of linear regression demonstrated that professional development of teachers in can be predict through the process and effectiveness of induction program.

VII. Discussion

The main objectives of this study were, to find out the effectiveness of induction training program on trained **mathematic** teachers, and to evaluate the Induction training program for **mathematic** teachers as predictor of future modality, researchers developed three research questions, what is the effectiveness of induction program modules regarding improvements? What is the relationship between induction program and professional development?and to what extent induction program predict the future modality of professional development of **mathematics teacher.**

It was found that there was difference between male and female trainees with respect to the induction-training program of is effective for future modality of professional development (Hendricks and Potgieter, 2012). The pre-test and post-test explored that induction training program was imperative for the futuristic approaches to equip the teachers with skill, knowledge, and advancement (Chidambaram, Ramachandran, and Thevar, 2013). The factors of the induction-training program have gained the accomplishment strategies for an educational organization.

Although every organization realized the importance of induction training program nowadays. Adding the importance of the induction-training program, this study evaluates the induction-training program as predictor of future development of professional as modality tool. Junior School **Mathematic** Teachers were higher (M = 4.3846) than the mean scores of High School **Mathematic** Teachers in teaching profession (M = 3.8462) due to the more practices and organizational behavior. It was also highlighted in this study that there were positive association between the factors of induction training program (Lim, Lew, and Chew, 2013) and effective professional development. After training teachers who attended the induction-training program also showed significant changes regarding teaching, Similarly to Davey (2004) said that applied psychology change in behavior by changing persons and their attitude towards objectivity. Therefore, with proper programming in sense of training for teachers for future modality their attitude towards latest implementations of teaching methods can be change.

VIII. Conclusion

The analysis of this study and discussion led the researchers to conclude that induction program for mathematic teachers' in-group was effective in developing teaching professional. Although many factors influence the program held by government. The results of this study related to the previous researches such as Hassel (1999), Olivia and Palwas (1997), Shulman (1987), Lim, Lew, and Chew (2013), Klein & Weaver (2000), Wesson &Gogus (2005), Moscato (2005), Ruhela and Singh (1990) and many others. These researchers agreed that induction training program is the process to develop the professionalism, competencies, knowledge and skills in mathematic teachers with increasing level of efficacy. This study is the evidence of the importance of induction training program for mathematic teachers used as tool of development of teaching professional in Pakistan. It also can be predicting the success behavior of educational teaching professional with the level of improvement. It develops the sense of C1arity in content, Organized Presentation to students and institute, Classroom Management, Demonstration for complex concepts, Educational Climate, Information & Communication Technologies, and Techniques for teaching mathematics. This is concluded through this study that novice teachers learn during the training an Experienced teaching in better way as comparative environment. Induction training program is strengthening for an organization to predict the performance of teacher professionally (Bush and Wood, 2005).

Furthermore, it was concluded that quality education demands qualified and competent teachers. And induction training programs play vital role in development of personal skills and groomed them for advanced era. As Smaldino, Lowther, and Russell (2008) stated that teachers had to prepare themselves for discovering new technological capabilities and techniques that improve their learning and teaching

experiences. This study is helpful for those researchers who finds the factors affect the professional development and especially for teaching professional. As such short-term program of induction training impact, the professional consequences relatively. Initial and necessary alignment in design such kind of program by experts ensures the guided changes in teaching. And successful execution after training is effortless professionalism to support academic structure. In supporting conclusion this study recommended that more builder opportunities for development in teaching professional, induction training programs is continuing effective practitioner center to design future modals.

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