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THE MATHEMATICAL DEVELOPMENT BELIEFS OF EARLY CHILDHOOD EDUCATION (ECE) TEACHERS: A CASE STUDY OF SOUTHERN PUNJAB PAKISTAN

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Abstract:

The purpose of this article is to investigate about the beliefs of ECE teachers in the teaching of mathematics. Beside this, it may also help the researcher in developing the professional programs for ECE. This research is a case study with six respondents from the D. G. Khan city of southern Punjab, Pakistan. A brief and organized interview was conducted from all six respondents keeping in view the guidelines of the instrument, "The Mathematical Development Beliefs Survey". Thematic and confined analysis was used to process data. Results of the data acknowledge that mathematics is a very valuable part of the curriculum of ECE, it boosts the students' confidence and early childhood shows readiness for learning mathematics. Thematic analysis of the date shows that all the respondents were lacking in the basic knowledge of mathematics and that's why they were also lacking in confidence in mathematics teaching. In this research on the basis of results of the obtained data, it is suggested the aims of the ECE development programs should be to increase the basic knowledge of mathematics and to boost confidence of teachers in mathematics teaching. The potential applications of study include informing evaluation and development of the early childhood education teacher programs preparation and the professional development interventions.

Key Words: ECE, Teaching, Mathematics, Teachers' Belief.

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1. Introduction

In Pakistan, children have to attend pre-school classes before going to start essential schooling. Main institutions for pre-schooling are kindergarten so-called day-care centers. In pre-school classes learning experience have key role and stands beside the play of a child. During these days among other activities, main focus is on the development of mathematics concepts like counting, figures and writing. During pre-schooling learning in mathematics take place accidently according to situations. A lot of researches have been done in recent years about the teaching of mathematics at ECE level. The belief and confidence of a teacher is very essential in mathematics teaching at different levels of education but at ECE level confidence and belief of a teacher has a key role in flow of mathematics teaching (Wigfield & Eccles, 2002). Function of belief is to find out the actions and motivations of an individuals and is a good source to predict about the behavior of a human as compared to its actual abilities (Campbell, 2002).

The early childhood education has played significant role in shaping the attitude of the students and teachers towards the curriculum and courses development. The existing understanding of several experts in ECE is that supportive early mathematical development is the significant part of curricula (preschool) (Ginsburg, Kaplan & Cannon, 2006). In this connection, the wide-ranging research during the past decades proposes that it is understood that what kind of mathematics need to be maintained in the classroom (Ginsburg, Lee & Boyd, 2008; Clements, & Sarama, 2007; Baroody, Lai & Mix, 2006) and that teacher views mark how and even whether such curricula and programs are thus implemented in letters and spirit (Lee & Ginsburg, 2007a; Copley & Padron, 1998). Though, the validity-tested means to quantify that to what extent these beliefs are lacking. This study provides a tool to measure teachers' beliefs about the teaching and learning of mathematics in their preschool classrooms.

Literature review

In increasing the mathematical abilities of a children, the role of a teacher is very important. Teaching strategy adopted by the teachers should linking and be according to the skills of children. These teaching strategies will stimulate their skills, understanding and thinking in new situations (Derry, 2013). It is the responsibility of a teacher to motivate, create interest in mathematics and mold a child to seek experience during mathematical learning process. It will be only possible if teacher is good in teaching skills and having quality knowledge and ability to make mathematical learning process so impressive that early childhood enjoy this learning. To make the learning interesting and joy able for children, a teacher should provide different kinds of activities that can stimulate and explore the thinking and abilities of a child. (Kozulin, 2003). The belief of a teachers to be analyzed is very essential because many researches have proved that belief of a teachers has great influence in the classroom's activities during the

development process of these classroom activities. Belief of a teacher also influence mathematics teaching process in classroom (Kim, 2013). It also influences the classroom attitude and motivation of a teacher in changing teaching strategies and pedagogy to implement curriculum (Stipek D J, 2001).

High confidence of teacher as a great impact on the teaching learning process in classroom especially during implementation to complete the curriculum. Confidence of students as a learner of mathematics is directly related with confidence of teacher's teaching ability of mathematics (Oppermann et al., 2016). The early childhood curricula are required increasingly in classrooms to instrument mathematics teaching. The said strategy stress on mathematics early education is owing in huge part to the considerate that involvement in contemporary world needs capability in mathematics, and that youngsters' early assistances in mathematics offer the basis for later learning (Duncan, Claessens & Huston, 2007; Clements & Sarama, 2009; Baroody, Lai & Mix, 2006). The lack of early knowledges that backing mathematical skills development may lead to lesser mathematical acquisition skill along with the overall lower educational achievement (JordanKaplan & Ramineni, 2009). In this regard, several institutions have necessary changes in the means that childhood early teachers are educated in the domain of mathematics which is thus helpful in recommending the curricula that support the young children's mathematical development.

Material and methods

The methods and procedures that are necessary for conducting the research study have been offered in this section. The study is cross-sectional in nature and focused on the views about the mathematical development beliefs of early childhood education teachers. This research facilitates the researcher to perceive the knowledge about the complication of the problem and how this problem can be examined in detail so this is a case study research (Swanborn, 2010). This research article provides information regarding belief of a mathematics teacher in ECE.

Research Design

The research design denotes the inclusive strategy that the researcher selects to assimilate the diverse mechanisms of the study in the logical and coherent way, thus, confirming that what is needed to effectively address the problem of research; it establishes the plan for the data collection, measurement, and analysis. Purposive sampling was used to choose the participants of this study. Purposive sampling is a type of non-probability sampling where researcher trust on his judgment while selecting participants of the population to take part in the study. Here sampling was done on the bases of some specific characteristics. Six teachers from ECE level were selected who were teaching to K.G class from the city of D.G. Khan,south Punjab, Pakistan. Supposed names of the participants were Sana, Saba, Maham, Maheen, Minahil and Hafsa. All six participants were well experienced teachers having 8 (eight) years teaching experience at ECE level.

A teacher having experience of 8 years in ECE have the abilities to improve the mathematical thinking of the children and also can manage the classes properly (Lee J E, 2017). In the start of the study, the researcher contacted with the Principals of the respective schools from where the participants were selected to get permission to be participated in study. In this process it is studied that how the views and beliefs of a teacher influence the mathematics learning and skills of the children during teaching learning process of mathematics. A semi-structured interview was conducted to all six participants under the guidelines of considering interview as instrument developed by Platas(2015) "The Mathematical Development Beliefs Survey".

These instruments were classified into four groups by Platas, 1) Behave and conduct of teacher in mathematics guiadance; 2) Mathematical Development as preschool goals; 3) Appropriate age; 4) Mathematical Knowledge generation venue.

Data analysis

In this study a confined, particular, sectional and thematic analysis was used. This type of analysis are used to recognize those themes which are constructed during experience and phenomenon(Boyatzis, 1998). Main objective of this type of analysis is todiagnose such patterns and themes that are collected by the researcher through the data (Braun V & Clarke, 2016). The type of analyses applied in this study was according to the steps mentioned by Creswell (Creswell J w, 2007). 1) Data preparation and its illustration;2) Scrutinizing of data and coding it; 3) Outlining and formulation of themes; 4) Reporting and presentation of the obtained results; 5) Explaining the concept of results and findings.

On the bases of Thematic analyses themes which were used to be identified in this study are 1); Basic mathematics and its importance; 2) Early childhood mathematics and its importance's belief; 3) Mathematics learning and early childhood readiness belief; 4) Teacher's role and ECE; 5) The confidence and belief in mathematics teaching. On the bases of obtained results and responses these themes are explained below.

Basic mathematics and its importance

Responses of all the six respondent were positive and they were agreed regarding importance of knowledge of basic mathematics. According to Maham and Minahil, basic knowledge is very essential because it boost the confidence of a teacher. She also said that if a teacher has a mastery over the content material he/she will never feel any problem in explaining and introducing new object and numbers. According to Maheen and Hafsa basic mathematics knowledge is very essential and helpful especially in developing and conducting proper activities and strategies. Sana and Saba were also agree on the theme that basic knowledge of mathematics for teachers is very essential and useful. All they were agreed on the theme that without basic knowledge of mathematics a teacher cannot interact and deal directly with students to solve their problem in mathematics.

ECE in mathematics and belief about its importance

Responses of all the participants shows that mathematics in early childhood education curriculum is a very important part. Reasons given by Sana and Maham were same regarding importance of mathematics in ECE that children needed the knowledge of mathematics in their present and future daily life. Minahil and Hafsa believe that some skills of children like that art skill and language skill are related to mathematics. Saba and Maheen stated that social life of early childhood is also influenced by mathematics. When children talk about number of toffies or candies that he has more than other they are actually using mathematics. All respondent were agreed on one thing that activities of mathematics are not too much time consuming so they thing that social and emotional development of children will not be ignored if they use the mathematics activities.

Mathematics learning and belief of early childhood readiness

Responses of all the six participants acknowledged that developmental activities of mathematics at pre-school and K.G (kindergarten) can be performed. They all also acknowledged that all the activities and strategies must be performed orderly so that children may not be lacking interest and not be bored. Saba and Sana stated that it is the responsibility of teachers that they motivate the children to take part in these activities. Maheen said that children are ready to learn mathematics normally at the age of five (5) years. But Minahil added that if someone is ready to teach the children about the numerals they can learn even in the age of two (2). According to Maheen children will not advance in mathematics education if the children are not facilitated and engaged in mathematics teaching in early childhood because early childhood education (ECE) is the golden and important age.All six participants denied on the issue that if someone try to memorize the numbers to children before kindergarten and pre-school level.

ECE and Role of Teacher

All participants acknowledged and were agree that in ECE teacher's roll is vital and here teacher acts like a facilitator to make improvement in the concepts and knowledge of children. In mathematics activities his role is just as a facilitator. All the respondents denied and disagreed the point that without support of a teacher, early childhood can learn mathematics. So we can say that ECE without a teacher role is not possible because children will learn mathematics as per instructions given by the teachers.

The confidence and belief in mathematics teaching

In this study, the participants namely Maham, Sana, Maheen and Hafsa said that they are lacking in confidence and are not sure that they can develop and manage proper mathematics activities. They said that they are lacking confidence because they don't have proper knowledge and concepts of mathematics. However, they were using his experience and were putting full efforts in applying and designing such activities and strategies that are helpful in introducing mathematics knowledge and concepts in children for creative and effective learning. Remaining two

respondents were feeling full confidence and they were developing and performing proper mathematics knowledge-based activities and strategies this was because they were well trained in using media for ECE teaching. Both were trained from professional teacher's development program and this experience make them confident. They said that by the experience of training they were able to motivate and engage the children in mathematics learning.

Discussion

Results of this study affirmed and acknowledged that all respondents were agree about the importance of mathematics in the curriculum of ECE. They agreed that mathematics contribute a lot in developing confidence in children. All six participants were agreed that early childhood is ready to learn mathematics if proper and developed mathematics activities are applied. They all accentuated and focused on the development of activities be so creative and motivating that children take keen interest in learning mathematic knowledge. This indicate that all respondents abetted and promoted that in ECE children, must be taught mathematics because it will have a very good impression on classroom activities (Chung K-E, 1994). According to (Ginsburg, 2008), belief of teachers is important regarding children's readiness to learn mathematics in ECE. Now if we discuss about the confidence of a teacher, the participants namely Maham, Sana, Maheen and Hafsa (2008) said that they are lacking in confidence and are not sure that they can develop and manage proper mathematics activities because their basic knowledge of mathematics was not up to mark.

All participants acknowledged and were agree that a proper strategy is required to develop activities of mathematics and this is only possible if they have a basic knowledge of mathematics. These findings are according to the lines stated by (Clements and Sarama,2014) that if knowledge of teachers about mathematics is not according to the required standard then they will feel uncomfortable. The significance of this study is that if someone try to teach mathematics then he/she should not feel that they are incompetent to do this (Platas, 2015). To overcome this feeling, they should be given more knowledge and education of mathematics and be given more chance to attend the training programs regarding ECE (Chunng, 1994). These conclusions supports the point of view of (Platas, 2015) in teaching of mathematics at ECE level two basic problems are faced, one of them is effect of belief of a mathematics teacher for developing and applying ECE classroom activities while second one is they don't have affective training in teaching mathematics at Early Childhood Education. For this purpose, the main objective of professional teachers training programs be to enhance, boost and motivate the teacher's confidence and belief that their job is not only to complete the curriculum but they have to motivate the children via effective developed activities in teaching of mathematics. Difficulty phobia regarding teaching of mathematics at Early Childhood Education can be

decreased by purposeful and effective professional teaching training development programs for ECE teachers.

CONCLUSION

When the knowledge, education and experience of teachers are increased by these effective professional programs, automatically their belief and confidence be increased towards ECE mathematics teaching. Results of this study affirmed and acknowledged that all respondents were agreed about the importance of mathematics in the curriculum of ECE. They agreed that mathematics contribute a lot in developing confidence in children. All six participants were agreed that early childhood is ready to learn mathematics if proper and developed mathematics activities are applied. All respondent were agree that children must be teaches mathematics at Early Childhood Education. Some teachers said they are lacking in confidence and are not sure that they can develop and manage proper mathematics activities because their basic knowledge of mathematics was not up to mark. Difficulty phobia regarding teaching of mathematics at Early Childhood Education can be decreased by purposeful and effective professional teaching training development programs for ECE teachers. The potential applications of study include information evaluation and development of the early childhood education teacher programs preparation and the professional development interventions.

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