

An Evaluative Study to Pre-service Primary Teachers in Mathematics in Egypt

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Introduction

The process of preparing, training and supplementing the pre-service mathematics teachers with the basic skills considered to be one of the most important tasks in faculties of education. This is done through teaching academic, educational and general cultural courses; in addition to the actual training supervised by a group of specialized people, usually one of the faculty professors or subject supervisors. Teaching Practice is an important stage in pre-service mathematics teachers' teaching lives, for it gives them a good opportunity to practice all what they have learned from the academic, educational and general cultural courses, and they directly face students and live in the school environment with all its internal and external elements

Weinstein (1990) has pointed out that teaching practice is the period in which the real level of the pre-service teachers' basic skills are determined, which will enable them to be successful teachers in their future. Ponte and Brunheira's (2001) has pointed out that teaching practice will lead to a constructive change in the pre-service mathematics teachers towards teaching process because the experiences through which they pass, and the activities that they practice will help them form general perspective concerning teachers' job and responsibilities. To sum up, the basic tasks of teaching practice can be summarized into main points. First, it offers a good opportunity to train the pre-service mathematics teachers' basic skills and use them in a right way inside the classroom. Second, accommodation with internal and external circumstances concerning teaching and learning process is one of the important points. Moreover, forming positive attitude towards teaching job and developing it are ones of the teaching practice aims. (Nady Kamal Aziz, 1999).

According to the NCTM (1991), the student-teachers' understanding of different teaching strategies is one of the basic standards that teachers have to master. Consequently, it enables them to communicate inside the learning community, arouse students' curiosity to ask questions and discuss new ideas and work in groups. Generally speaking, teaching practice is important in preparing the pre-service teachers, and specially the primary pre-service mathematics teachers, and that is for the importance of mathematics in this stage and the great responsibilities of primary teachers.

The remissness of teaching practice leads to the suffering of pre-service mathematics teachers from the big gap between the limited experiences before graduation and the limitless experiences in schools after that. (Mahmoud Shouk & Mohamed Malek, 1995).

Raymond's study (1997) emphasizes this point by saying that what student-teachers care for is mathematics as academic subject no more no less, and they ignore the different ways in teaching such a subject. Hughes (1999) further elaborates that the teachers' ignorance of different teaching methods comes as a direct result of the concentration of the student-teachers on mathematics as academic and theoretical subject

Mapolelo's (1999) emphasized that the master of the primary student-teachers of the basic skills is not enough, since they are insufficient as far as the skills essential

in teaching mathematics, especially the ones related to asking questions and dealing with students' answers, are concerned.

As a result of that great emphasis on the academic and theoretical subject, there is an inadequacy concerning the primary student-teachers' basic skills are concerned. This inadequacy is shown in two aspects. The first aspect is concerned with the result of some studies that can be divided into two parts. The first cares about evaluating the basic skills essential in teaching mathematics for pre-service mathematics teachers such as Fouad Mousa (1997), Fayza Eskander (2000) and Yasmine Zidan (2000) which show that there is apparent insufficiency concerning such skills. The second aspect cares about presenting or recommending program which help student-teachers of mathematics develop the basic skills concerning teaching mathematics such as Hefny Esmail (2000), Manal Soutohy (2000) and Manouchehri (2002) which have a great effect on making Mathematics teaching a successful process. The second aspect of the inadequacy of the primary student-teachers' basic skills essentially in teaching mathematics and learning process is the researcher's observation of the primary student-teachers of third and fourth years in Alexandria University, Faculty of Education, Alexandria and Marsa- Matrouh branches. Moreover the supervisors who are supposed to guide and evaluate those primary student-teachers of mathematics criticized them and mentioned that there was insufficiency in the skills and that they were incapable of practicing teaching in effective way inside classrooms and applying what they have studied in their course on "Methods of Teaching". From above mentioned finding, it seems that there is a problem in student-teachers' education, which the present paper deals with to develop such skills.

Limitations

The study is limited into:

1 A group of primary student-teachers of mathematics of the third and fourth years in Alexandria University, faculty of education, Alexandria and Marsa Matrouh branches, because of the special field, that is mathematics, starts in third year according to the faculty's regulations.

2 Evaluating the performance of the primary student-teachers, the study sample, in some of the basic skills essential in teaching mathematics. This is done by using an evaluation sheet prepared by the researcher to evaluate the performance.

3 Constructing and experimenting a suggested programme to overcome the problems revealed by the weakest domain as shown by the results of the checklist of evaluation performance (CEP).

The study Questions:

1 What is the level of the performance of the primary student-teachers concerning basic skills essentially in teaching mathematics in Alexandria University, faculty of education Marsa Matrouh branch?

2 What is the effect of the suggested program on developing the performance of the primary student-teachers?

The study Hypotheses:

1 There is a significant difference between the level of the performance and the expected level of primary student-teachers concerning basic skills as far as Lesson Planning is concerned.

There is a significant difference between the level of the performance and the expected level of primary student-teachers concerning basic skills as far as the lesson performance is concerned.

There is a significant difference between the level of the performance and the expected level of primary student-teachers concerning basic skills as far as Lesson evaluation is concerned.

The suggested program is highly effective.

Sample

The study sample is chosen according to:

All primary student-teachers who are registered in the third year of the year 2003/ 2004 in Alexandria University, faculty of education, Marsa Matrouh branch. There are 24 students, after studying Teaching Strategies and Skills and Mathematics Methodology Courses, repeaters were excluding.

All primary student-teachers who are registered in the fourth year of the year 2004/ 2005 in Alexandria University, faculty of education, Marsa Matrouh branch. There are 20 students, after excluding repeaters.

Procedures:

To answer the first question of the study questions, the researcher did the following

Preparing the checklist of evaluation performance (CEP).

a) The Aim of the Sheet:

The Aim of the (CEP) is to evaluate the performance of the primary student-teachers concerning basic skills essential in teaching mathematics.

b) The preparation of the Sheet:

The (CEP) includes 11 standards, divided into 3 domains and 60 indicators. The researcher also defined a preliminary list of the special domain concerning mathematics teaching, divided the standards related to each domain and put the significant indicator of each standard.

c) Estimating the marks:

The researcher defined the marks of each minor skill by giving them (0/1/2) marks according to student teacher performance.

d) Applying the (CEP):

The researcher observed the performance of student-teachers during the second semester of the year 2003/ 2004 of the third year inside classrooms and used the (CEP) to evaluate the different skills. That was done for two classes, one in arithmetic and the other in geometry during the second semester of the year 2003/ 2004. It has to be noted that, before observation, the primary student-teachers were informed that the result of the observation would never affect their marks in teaching practice subject.

The researcher counted the average of the marks in each domain of the evaluation domains included in the (CEP) and then found the percentage of each domain. It is found that the highest average percentage of the performance of the primary student-teachers was of the lesson planning domain 67.81%, then the lesson performance 50.8%. However, the evaluation domain was the least of all domains 37.69%. In addition to that, the result reveals a great amount of inadequacy of the primary student-teachers' basic skills essential in teaching mathematics. In other words, their level does not exceed 49.83%, which is lesser than the limit accepted on the educational level (70%).

The researcher's findings agrees with some studies, such as Linda's (1994) which have pointed out that the inadequacy of the planning program in faculty of

educations and the inability to make students acquire the basic skills are indeed in a bad need to be developed.

The researcher's study agrees also with Mabilelo's study (2004) as far as the inadequacy of the primary student-teachers' basic skills are concerned, especially the skills related to asking questions and dealing with students' answers. Moreover, The results of the current study agree with some foreign studies, like John's (1994) and Mary's study (1996) as far as the inadequacy of the student-teachers of different stages concerning authentic and alternate assessment which can be used to evaluate students' levels.

The qualitative analysis of the study results stresses that:

The primary student-teachers are concerned with defining the learning objective in an accurate way, although most of them emphasize the cognitive levels related to recalling and understanding. This can be led back to the ways they were taught in the Teaching Strategies and Skills course in second year and Mathematics Methodology course in third year.

The mastery of the scientific subject is efficient; however, most of them are incapable of linking mathematics with students' past experiences.

Student-teachers use only the textbook, board and chart do not use other developed aids in teaching.

Most of the students' homework depends on the exercises of the textbook and the student-teachers usually are not involved in any educational activity in mathematics.

Student-teachers ignore the warm-up stage which is a vital stage in arousing students' attention.

Student-teachers do not pay attention to link the current lesson with previous lesson or lessons. In addition to that, most of them ignore the summing up process that helps students concentrate on important points.

Student-teachers concern more with summative evaluation rather than formative evaluation as far as planning and performing the lesson are concerned.

Most of the student-teachers do not have the ability to apply and make use of what they have learned in their Teaching Strategies and Skills course in second year and Mathematics Methodology course in third year.

Student-teachers are not so good in using language of mathematics especially when they ask oral questions in different ways.

Student-teachers do not master the skill of questioning.

Student-teachers ignore the different ways in solving one problem and depend on one way only. Moreover, they do not encourage students to create alternative answers, solutions to mathematics problems.

Student-teachers ignore asking innovative questions related to students' everyday lives to give the chance to make use of mathematics in their daily lives.

From the previous results, the student teachers' are not good in basic skills of teaching Mathematics. Therefore, the researcher designed a program to develop the **weakest domain** as appeared in (CEP). The following steps are used in building up the programme for the student teachers' education in the evaluation skills domain.

The general objective of the training program

The training program aims at developing the ability of the trainees of preparing and using the evaluation tools, used to evaluate different mathematics lessons.

The program period 2

The program can be included as a part of the micro teaching subject which is taught in some of faculties of education or as a unit of the Mathematics Methodology course. This program needs 20 hours (4 hours per day) for five days.

The subject of the program 3

This subject includes: concept of evaluation and its types; oral and written evaluation; tradition and authentic evaluation; asking questions; questions types; cognitive levels of questions; nonroutine questions; life questions; reinforcement; and thinking development.

Performing the training program 4

The training program is performed on the same group of student-teachers; the researcher conducted the (CEP) pre and post the training. In order to measure the effectiveness of the training program, the researcher found the value of Π^2 that was 0.87 and “d” value 3.66 that refers to the effectiveness of the independent variable and its effect on the dependent variable. (Toothaker & Miller, 1996)

Generally speaking, it could be said that student-teachers have benefited from the training program and their lesson evaluation skills have been developed.


This means that the fourth hypotheses of the study have been achieved.


Results Discussions

The effectiveness of the training program can be due to the method of designing the training program that consists of six training periods. Each one of those training periods dealt with a subject whose objectives, exercises and activities were determined before, and being exposed to the content of the training period before its performance, the primary student-teachers were highly motivated and enthusiastic concerning the individual and group training.

The effectiveness of the training program can also be due to the strategy used to develop the content of the program which mostly depended on brain storming and discussion that depended on the trainee's activity, the trainer's presentation and the positive reinforcement. Moreover, the content of the training program deals with the basic skills related to the lesson evaluation that the primary student-teachers feel that they are inadequate as far as their teaching methods are concerned, so they are in a bad need for it to perform their teaching job in a successful and effective way. Therefore, they are highly motivated to study the subjects of the training program.

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