

THE NECESSARY TEACHING COMPETENCES FOR MATHEMATICS TEACHERS IN MIDDLE SCHOOLS

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ABSTRACT:

The professional competences of middle school mathematics teachers has been identified , also the significance extent of such competences for chinese and yemenies mathematics teachers has been studied.. The researcher used descriptive research approach. The study data collected from Specialist educators and teachers experts to determine the mathematics teaching competences.

To know how the mathematics teachers apply those competences, the researcher distributed a questionnaire to 45 chinese teachers and 90 yemenies teachers in middle schools, after testing the validity and computing its reliability through pearson correlation coefficient which was 88%.The study created a list of necessary competences for mathematics teachers, and distinguished teachers point of view on the competencies significance.

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1 .INTRODUCTION:

The task of improving the teaching and learning of the priorities of many states whether developing or not developing states, we belief that these process will contribute to the achievement of real targets of these states and their hopes for the future.

The teacher preparation is the most important factors that will help to achieve the desired education renaissance of the commuting in all aspects, and efficient teacher is the teacher who are capable of achieving the objectives of the education effectiveness and proficiency.

States that are trying to achieve a comprehensive in all aspects of life require teachers to posses many skills, including planning and evaluation and teaching methods effectives modern, and successful management of classes.

Teaching is more than picking up a bag of instructional tricks at the schoolroom door or learning to mimic the actions of another educator even a very good one.

Good teachers are thinkers and problem solvers. They know when children are not learning and can adjust instruction appropriately, they know how to design and use a variety of assessment techniques not just paper and pencil tests, they know how to work with parents to bring out the best in a child, they know that teams of professional educators can transform schools and expect to go about doing it (D.Roth, W.Swail, 2000)

Teachers of mathematics at any level should know and understand mathematics substantially beyond and below that which they are expected to teach, they should be able to relate mathematics to the world of their students, and to the natural science/social science.

Often the student faced a problem and difficulties in the study of mathematics this requires looking for the best ways and means to solve these problems and we can reach only by the appropriate evaluation means.

Therefore it is necessary to identify the teaching efficiency which applied by teachers during teaching.

Bandura (1977), identifying teacher efficacy as a type of self-efficacy a cognitive process in which people construct beliefs about their capacity to perform at a given level of attainment.

Teacher efficiency has been defined as the extent to which the teacher believes he or she has capacity to affect student performance. (Berman, et al, 1977)

Previous research has found relationship between student achievement and three kinds of competences it is the self competency of student, the sense of competences of teachers, and the collective competences of school. (Goddard, Hoy, Woolfolk; Hoy, 2000; Pajares, 1996; Ross, 1992, 1994, 1998; Teschannen-Moran, Woolfolk Hoy, 1998).

So that these paper try to identify the competences of mathematics teachers in middle schools and try to know teachers point of view on the competencies significance. Because the primary stages are considered as an important stage of public instruction that it endeavor to prepare students for the life.

2. Methodology:

2.1. Study design and sampling:

The study community are mathematics teachers in the elementary stage china wuhan city and yemen sana'a city.

Table no (1) shows the study sample

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| country | Sex | male | female | total | |
|---------|-----|-------|--------|-------|----------|
| y | 42 | 46.7% | 48 | 53.3% | 90 100% |
| c | 22 | 48.9% | 23 | 51.1% | 45 100% |
| total | 64 | 47.4% | 71 | 52.6% | 135 100% |

Y: yemenies person

c: Chinese person

To identify the necessary competences which must mathematics teacher be available the researcher made the following:

-Informing the researchs and studies which relate to competences teaching.

-Making interview with experience teachers and education scientists and offer questionnaire to them to know the important efficiency of teaching mathematics the questionnaire consisted from the following questions:

1-What preparation do you usually do before classes when you are in the process of math teaching?

2-What do you think that the students need math?

3-How many parts can you divide in to the math teaching goals?

4-How do you deal with the relationship between math and the life experience of students?

5-How do you plan to cultivate the “math thought pattern” of the students?

6-What function does the interaction between teachers and students plays in the math teaching?

7-How do you lead the students to learn actively?

8-How many basic skills do you think that a competent math teacher should have?

-Analysis responds of questionnaire

-construct questionnaire consist from 5 level including important mathematics efficiency of teaching

2.2. Questionnaire validity& Reliability

To know the validity of questionnaire the researcher offer the initial formulation to many of specialists and education experts at the huazhong university which consist from 18 arbitrators and told them to give their opinions about the validity of instrument and suitability of measurement efficiency.

-According to the arbitrators opinions the researcher made appropriate adjustments, and to know the reliability of the questionnaire the researcher offer the questionnaire to sample consist from 20 teachers and he offer again to the same teachers after two weeks then computing the consistency coefficient was calculated using pearson correlation coefficient between the first and the second application which was 88%

3. Data collection methods:

After verifying the validity and reliability of the questionnaire and defining the study sample, the researcher carried out applying the questionnaire aiming at collecting the data of the study, questionnaire papers were distributed directly to sample members after explaining the goal of the study and the way to answer the questionnaire items.

The period of questionnaire distributed for the Chinese teachers was in april 2006, and in Yemen the study started from the end of September to mid October 2006/2007..

After construction the questionnaire including mathematics teachers competences that had answered the first study question, and to answer the second question the researcher offer the questionnaire to the mathematics teachers to know teachers point of view on the competencies significance.

The researcher offered a letter with questionnaire to some teachers as samples to explain how to mange the questionnaire and were requested to make mark on front of the phrase to shows the importance level of competency.

After the process of gathering the survey data, the researcher carried out interpreting the significance degree levels into arithmetic degree, where he allotted 5 degree for the principal significance, 4 degree for the great significance, 3degree for medium significance, 2 degree for non-significance, one degree for non-existence of significance.

Also, the following criterion was adopted for interpreting the significance degree according to the assessment of the research samples:

(4.5 -. 5) principal significance

(4 - 4.4) great significance

(3 - 3.9) medium significance

(2 - 2.9) non-significant

4. RESULT AND DISCUSSION

The study aimed to identify the necessary competences for mathematics teachers in the middle schools, and try to know teachers point of view on the competencies significance. In the following the results of study according to the study questions:

1-What the necessary competences for mathematics teachers in middle schools?

2- What is the significance extent of such competences for the mathematics teachers in the last three grades of the elementary education?.

After construction the questionnaire including mathematics teachers competences, that had answered the first study question, and to answer the second question the researcher offer the questionnaire to the mathematics teachers to know teachers point of view on the competencies significance

Table. no.(2). Shows teachers point of view on the competencies significance, descending order and the standard mean and the standard deviation of each competency.

| Item no. | Items | mean | Std.dev-iation |
|----------|--|------|----------------|
| 5 | identify the instructional objectives | 4.50 | 0.690 |
| 52 | Creates a positive learning environment | 4.47 | 0.751 |
| 19 | develop ability to draw reasonable inferences from observations from observations | 4.30 | 1.015 |
| 2 | plan lessons on a daily basis | 4.22 | 1.012 |
| 60 | Select and creates learning experience that are appropriate for math goals relevant to learner and based upon principles of effective instruction. | 4.13 | 0.968 |
| 22 | improve mathematical skill | 4.12 | 0.873 |
| 49 | Aligns the assessments with the goals, objectives, and instructional strategies of the district curriculum guides | 4.10 | 1.024 |
| 20 | develop ability to synthesize and integrate information and ideas | 4.08 | 1.00 |
| 1 | plan effectively for both long and short time | 4.08 | 1.079 |
| 17 | develop problem solving skills | 4.03 | 0.946 |
| 23 | use standardized achievement and diagnostic | 4.02 | 0.902 |
| 8 | use varies teaching methodologies | 4.02 | 0.988 |
| 18 | develop ability to apply principles and generalizations already learned to new problems and situations | 4.02 | 0.973 |
| 11 | ensure that student understand the objectives on the lesson | 4.02 | 1.096 |
| 21 | develop ability to distinguish between fact and opinion | 4.01 | 0.989 |

| | | | |
|----|---|------|-------|
| 28 | encourage and reward quality work | 4.00 | 0.855 |
| 10 | guide students in the discovery of concepts principles and generalization | 3.97 | 0.863 |
| 7 | analysis the text of book | 3.96 | 1.054 |
| 53 | Engages in appropriate interpersonal relationships with students, parents, community, and staff | 3.96 | 0.992 |
| 35 | endeavor to enhance the dignity and status of the teaching professional | 3.96 | 0.921 |
| 51 | Chooses and implements appropriate methodology and varied instructional strategies that address the diversity of learning | 3.96 | 1.112 |
| 54 | Engages in professional growth | 3.96 | 1.006 |
| 6 | plan the strategies that will employ in the teaching | 3.94 | 0.937 |
| 59 | implements lesson which link students prior knowledge with new ideas and provides effective anticipatory | 3.93 | 1.041 |
| 40 | manages time space, transitions, and activities effectively | 3.93 | 0.951 |
| 9 | use teaching resource materials prudently | 3.92 | 0.931 |
| 12 | provide adequate thinking time after posing question | 3.90 | 0.858 |
| 43 | Offers appropriate encouragement to all students | 3.88 | 0.939 |
| 48 | Assists students in the development of self-assessments skills | 3.87 | 1.047 |
| 25 | keep accurate assessment records | 3.84 | 0.971 |
| 38 | Conferences with classroom teacher prior to lesson to make appropriate modifications for special service student | 3.79 | 1.204 |
| 16 | develop ability to think creatively | 3.72 | 1.048 |
| 41 | Creates a positive learning environment where students feel comfortable and willing to engage. | 3.72 | 1.201 |
| 24 | vary my approaches to assessment including skills knowledge | 3.70 | 1.053 |
| 4 | plan regular assessment of student learning | 3.69 | 1.026 |
| 14 | give examples of the difference between knowing and using | 3.67 | 1.079 |
| 33 | participate in conferences and workshops when possible | 3.64 | 1.075 |
| 47 | Provides continuous feed back to students and family. | 3.64 | 1.033 |
| 15 | develop skills in using materials tools and technology central to this subject | 3.64 | 1.019 |
| 26 | reporting to parents is based on the assessment program | 3.64 | 1.097 |

| | | | |
|----|--|------|-------|
| 13 | adjust my vocabulary to an appropriate student level | 3.62 | 1.028 |
| 50 | Uses assessment techniques that are appropriate to the varied characteristics and developmental needs of students. | 3.61 | 1.139 |
| 57 | Make diagnosis tests to know the students errors in mathematic | 3.56 | 1.285 |
| 42 | Encourages students responsibility in the classroom | 3.55 | 1.342 |
| 55 | Use technological tools and others resources to locate select and organize information. | 3.50 | 1.177 |
| 31 | have effective dismissal , assembly and emergency drill routines | 3.42 | 1.156 |
| 32 | keep attendance register and cumulative records up to date | 3.41 | 1.212 |
| 27 | reporting program is consistent with school policy | 3.41 | 1.236 |
| 37 | Clearly states the expected learning objective to the student | 3.41 | 1.039 |
| 3 | recognize and plan for varying individual needs | 3.40 | 1.066 |
| 56 | Endear to make student to discover and evaluate patterns and relationships in information, ideas, and structures | 3.39 | 1.179 |
| 45 | Seeks opportunities to develop cooperative partnerships with the parents/guardians of students in support of student learning and well being | 3.36 | 1.090 |
| 39 | Identifies students prior experience, learning styles, strengths and needs when designing and implementing a lesson plan. | 3.36 | 1.055 |
| 36 | interested in the better operation of the whole school system | 3.33 | 1.222 |
| 44 | Provides clear and concise oral and written directions | 3.30 | 1.115 |
| 46 | use various ongoing assessment to monitor the effectiveness of instruction. | 3.30 | 1.086 |
| 30 | maintaining classroom as an orderly working environment | 3.26 | 1.106 |
| 34 | cooperate with colleagues to improve curriculum and instructional techniques | 3.19 | 1.290 |
| 29 | not indulgent for the students the debate during the lesson | 3.11 | 1.176 |
| 58 | Collects information through observation of classroom interaction, and questions and analyses student work | 2.73 | 1.345 |

From the table we can note the competencies which have got a principle significance are tow competencies, which are no. 5, 52

And the table shows that the majority of the competencies have got medium significance assessment. Where the highest competency [the competency no. 10] has got 3.97 degree and percentage of 70.4%, and the least assessment of the competency no. 29 has scored 3.11. where it is considered of medium significance from the point of view of the sample members, and the competencies which have got a great significance are 14 competencies, while the only one competency that got low significance.

Table. no (3) shows the difference in the competencies according to the country variable (Chinese-yemen).the sample of consisted of 135

t-test for independent samples test

| axis items | t | df | Sig(2-tailed) | Mean difference | mean | country |
|--|--------|-----|---------------|-----------------|-------|---------|
| Preparation competencies and planning the lesson | 1.404 | 133 | 0.145 | 1.067 | 28.16 | y |
| | | | | | 27.09 | c |
| Competencies in carrying out the lesson | 6.204 | 133 | 0.000 | 15.100 | 99.88 | y |
| | | | | | 84.78 | c |
| Educational means and tools | -2.590 | 133 | 0.011 | -1.689 | 16.98 | y |
| | | | | | 18.67 | c |
| Assessment competencies | 1.428 | 133 | 0.156 | 1.789 | 36.43 | y |
| | | | | | 34.64 | c |
| Personal competencies | 1.379 | 133 | 0.170 | 1.911 | 49.82 | y |
| | | | | | 47.91 | c |

y: yemenies teachers.

c: Chinese teachers

From a general review to the table it is evident the non-existence of statistic indicator on the 0.05 level in the degree of the following axis competencies;

1- Preparation competencies and planning the lesson .2- Assessment competencies. 3- Personal competencies.

Except for the Competences in carrying out the lesson, the difference is showed that it is in favor of yemenies teachers. and Educational means and tools, the difference is showed that it is in favor of Chinese teachers.

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