



Causes of poor math education in Iran and Solutions for Improving Based on Other Countries Experience

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ABSTRACT

Mathematics learning disabilities (LD) have gained increased attention over the last decade from both researchers and practitioners. Mathematic undoubtedly is one of the important courses which students need to know in all of the education stages. A large percentage of students receiving learning disability services experience difficulties with mathematics, but little research has examined the specific mathematics behaviors of students with LD who have teacher-identified math weaknesses. In this study, first we consider mathematics teaching in Iran and then propose solutions based on other countries experience. In general; there are various factors that prevent teaching and learning actively among students. Causes of math educational weakness relate to 3 categories: education ; students and book content solutions to improve each of them should be considered. A knowledgeable and active teacher should react to these factor before teaching then try to control preventive learning elements and provide essential motivation for active learning a money all of students.

KEY WORDS: Math teaching; Math teaching goals; factors of math teaching weaknesses

INTRODUCTION AND PROBLEM PROPOSITION

By looking in to civilization history; we find that no big civilizations emerge in universe except one that has power in mathematics[1].

Human should know science in order to meet his / her requirements and improve thought potential to find appropriate solution. Math is one of the science which improve thought potential. So; math development can play important role in countries development. Nowadays mathematics penetrate into all of human affairs. Math is a sign of human endless efforts to acquire knowledge. Mathematics is an important part of human culture. Culture and learning math is essential if we look at it only from this angle.

In general; low quality of teaching in all educational stages, from school to university; is inevitable phenomena in Iran education systems [2] and specifically some students don't have enough motivation to earning math. This causes educational downfall in these students. The present study has addressed weaknesses in mathematics education. Therefore, the history of research in the field of research about Subject of study and then The goal of mathematics education Is expressed.. In mathematics education research has pointed to the weakness of And finally, A comparison of Iran and other countries in math has been done. At the end of the study, analysis and recommendations to address weaknesses in mathematics education is presented

Back ground:

Seyedi (1362) in his study about math book stayed 3 of middle school found that teachers didn't have deep awareness about math course goals; didn't have enough dominance of this course and also weren't familiar with new ways of evacuating.

Raeis dana (1373) concluded from evaluating math book contents in middle school that content off books versus course hour is high and teacher has effect as book content in high down full [3].

Asghari (1364)has pointed teacher's severity as an effective factor for no ten deuey to math; difficult exam question and no justification of lessons[4].

Aali (1368) has concluded in his study about educational weakness factors that inappropriate and monotonous teaching make no motivation for learning math course[5].

He also pointed to difficulty and complexity of math problem understating. In first international study in 1964; companion of different educational disciplines in math was performed. In these studies social scientific variations and their impact on teaching – learning methods has been evaluated. One of results, was that math grade has positive correlation with student's view point toward math. Also; in class where student numbers are fewer, educational progress is higher [6].

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Jack weid and colleagues (1986) also analyzed second math study in Thailand in order to discover book effects on educational progress in math course. They concluded that any time teachers use text books to teach, math in their classes; student's grade was higher.

Hinman et al (1981) has pointed that textbooks and reading materials effects on motivation and positive tendency among students and its effect on educational progress in under developed countries are essential.

Ma manush and woun (1377) should that in some countries like Iran; evaluation level and problem sowing in math books are over considered, but math reasoning level and making relation in math teaching are under considered. Students with positive view point about one subject point are stronger in that course and negative ones are unsuccessful. This study also noted that more effective math teaching needs special knowledge about subject. Skills; familiarity with various teaching methods and skills in performing this method.

Theoretical fundamentals:

Math teaching goals:

Math teaching goals are different based on society math culture level; teaching content 1 and educational stages. These goal change from one society to the other but basic goal of math teaching is: "developing conceptual strength and reasoning ; making true thinking; providing reasoning method and logical thought in students." [7].

Prom jeorge pollia view point; thinking" is the most important goal of math teaching and he recommends teachers that improve thinking level in their student. In plato view point; math teaching goals are:

- 1) common culture
- 2) appropriate thinking
- 3) fair thinking
- 4) mind and sense
- 5)obtaining dominant characteristic.

Math teaching goal generally are divided in to 4 categories: nurture; education cultural and emotional. Below we will discuss each of these points.

A) nurture goal: nurture goals of math teaching undoubtedly are the most important part of this section. The most important duty of math teaching is nurturing student so that he/she can think of problem confidentially, find solution and solve his/her problems.

B) educational goal: (with computational techniques in or out of school).

In this goal; we should prepare students in relation with other course ; requiring computations and computations related to day to day life.

C) cultural goal: (student's familiarity with math as a part of culture): Mathematical science is an important part of culture. Pointing to math history of a nation can make a proud sense in math ; increase student's confidence and late the course to national history and tradition.

D) emotional goal pleasure in pursuing intellectual activities and interesting in specific knowledge can make us skillful in math learning and also trigger our curiosity; conceptual sense. Moris klain claims: "mathematics is the best intellectual results and creation of human mind". (Soleimani nasab 1373/43).

Over view of math teaching weakness factors:

In general: math teaching problem divides in two categories. Below ; we discuss each of the problem in detail.

A) math teaching weakness elements which are related to elementary text books content :

She of the most important goals of math teaching is that children solute problem in new situation and based on provisory learning's a this happens when we practice with them and provide new situation for solving problem. Comments and goal; we see that text books content results in limitation for teachers to reach this goal.

1) Time limitation: math teaching time is limited at schools. Sub material contents of math course in all stages are based on time table but solving problem and encouraging students to think , find solution and exercise in this related require time Mr. Ayobiom in this study about comparisons of math classes of German, Japanese and American teachers with teachers of Kurdistan state of Iran has shown that in other countries : teacher propose a problem and calmly supervise seconds. So; Iran's math course content is designed so that students should solve much of exercise without having any time to think any points and texts in our books should be teaches in 45 minutes this time is only for thinking about problem so that student can find a solution.

2) limiting teacher to choose appropriate content and activity: programs of math text books for elementary schools are designed so that prevent any selection from teachers and this leads teachers to focus their min only on text books. Revision of content and given right to teacher for choosing them; can differentiate activates which leads children to think from activity which are only time wasting.

3) leak of coordination in presenting course content: for better presentation; were for two stages. In math textbook stage ; when students are learning and performing division. Leave division's we see this problem more in

stages. according to points of 20 teachers; they said that basic problem of math course in this stage is lack of attention to clustering text books. So that students leave one part and after few pages they return to that part again. This causes teacher to review previous learning's for students and provide time limitation for teachers.

B) math teaching weakness which has special importance is children themselves. Some time we have students who yet good years in other courses and are successful in learning Farsi, history, ..., but have problem in math.

According to definition of computation and mathematic problem from Dismor ; his order in math learning is a server problem that develops in computational skills and determines by emotional or intellectual lag and undesired condition of school.

C) math teaching weakness factors related to training methods:

Math class is hard because it can't be performed with its language but limited in text book frame and teacher's teaching method. With large amount of points: teacher can't describe in teres ting parts and assented description about using these texts in life. Prof. vertimer studied about children's thought and evaluated it in different classes. The results show that most of teaching methods are without innovation and make thought solidity in children. He also concluded that repetitive exercises and machinery answer, which teachers expect; don't make reflections that healthy mind requires. Exaggerating about text repetition can be harmful. This type of nurturing is dangerous because force student to do works with closed eyes without thinking about them [8].

In piaje view point; logical mind imaginations generally human intelligence is generation of its internal acts. From his view point; description of truth and mathematical concept which is common in time teaching method; isn't enough. Observing figure for clearing resulting imagination accurate concepts, students should personally performs experiment, change things and problems in over to understand directly quantity relations [9].

So; one of the math teaching weakness factors in elementary school is that teachers don't use teaching methods which is proportionate with math course ; it means that this point for children to think and tell their thoughts who they are right or not. Well know that there are various teaching methods but all of them are accommodated in some general forms. So it is important to choose a method based on condition of class in order to obtain maximum yield but methods which are easiest ones are used for teaching this important course in Iran and usually the best method isn't easiest method. Methods are used that are appropriate for junior but one the worst to learn for children.

D) some other factors of math teaching weakness:

1) Place and atmosphere role: we introduced time limitation as a math teaching factor but place also is important. We actually know that class atmosphere to learn children has a crucial effect. For examples suppose a class which has small windows so light is low and noises' from automobile and people in the street cause non concentration. Created atmosphere by teacher is affective; a teacher who doesn't allow assessment to children, has no interest to think about problem solving .

2) Family role: most families think that they have no responsibility about their children's education because they send them to school and should only care about financial condition of them. But; since most of mathematical exercise are done home; lack of parent's attention to this issue can be one of math teaching weakness factors.

3) Private classes: one of the factors of no attention to math course is private classes student assures that if he/she doesn't understand courses, he/she will learn them again. However, students will be tired at school and can't acquire the points from private classes because solved problems are available for him/her.

Student thinks that he/she learns them but he/she find that he/she knos nothing and there is no chance.

4) Unavailability of scientific mathematical finding.

Our teachers don't access to enough sources about math teaching.

5) lock of attention to design in teaching and designing mathematical concept :

It means that pre requirements for concepts of mathematic should be teaches by desire and teachers. A child who doesn't learn multiplication concept ; undoubtedly has many problems[10].

Comparison of Iran with other countries in math teaching.

1. Iran:

In Iran math course program is designed nationally so that all schools must perform it. Course program goals are provided by text book assay and math council and are approved by higher education council. For examples mathematic course goal from base 1 to 8 are as follows:

- Introduce students with aspects of mathematics that related to other issues.
- Develop problem solution abilities.
- Develop math conceptions understanding in each problem and ability to explain them in each math forms.

Currently; course program guidance for text books doesn't exit.

In new version of elementary text books: based on learning theories; there are some changes. For example; subjects related to diminution and multiplication from grade 4 and decimal diminution from grade 5 have been removed. In new text books ; life aspects have been used for exercises and examples.

Middle school grade 3 text book has been changed. For example; analytical geometry introductions and geometric transformation are accommodated in this book. In high school with new education system ; text books have been completely changed and algorithmic mathematic is accommodated in all grades. Text books are provided and distributed by education ministry. All school are them. In middle and high schools; teacher exactly follows text books to be loyal to course program.

Most of text books include many figures and illustrations [11].

2. England :

In 1988 ; lesson program were firstly introduced that had been used in mandatory education level. Independent school aren't obliged to obey this national program but should select one of these approved programs. Using assistant educational instruments such as: calculation view toward math is negative. This causes them not to study math at higher at higher levels ; girls versus boys ratio to study math is lower and we will find a way encourage girls to study math. Text books naturally are provided by commercial companies. Yet; most of the books are old because programs have been changed but textbook haven't. now ; publishers are rewriting books in order to fit lesson program's. In England; many of textbooks that used much at high school are school math project (SMP) series. Until 1991; performing projects weren't obliged to receive diploma ; but after that; it was forced. Projects were introduced to lower degree students and these students were more encouraged to group works. Also computers are widely available at schools and students have been familiar with their usage or applications. In middle 805; an important discussion about teacher training and acquiring new technologies was introduced by teachers.

In England education discipline there are two types of evaluation : first ; continues evaluation which is done by teacher. Second external evaluation which is done at the end of 7,11,16 ages intensively. It should be noted that external evolution is performed typically. It's goal is evaluating education discipline and doesn't focus on personal evaluation[12].

3. Singapore:

In 1990; there was revision in math text books. New lesson programs have more emphasis on math concept , ability to solve mathematic problems and effecting teaching meth are used. These methods are : developing math concepts through doing meaning full activities ; applying math thoughts ; mathematical relations and solving math problem using computer technology in teaching mathematics. Education ministry of Singapore provide appropriate assistant educational materials and all have access to them. It show be noted that text books in this list are provided commercially. These books continue intended program without reflection. Students are encouraged to read textbook. But don't learn anything and use their teacher's teaching to do homework's.

As students want to more toward singularity through touchable process; teachers are encouraged to teach them through this trend.

Teachers are encouraged to use active method for learning students and apply various film or educational materials. Evaluation is one part of teaching and learning; it's goal is measuring learning scale. It surreys student's preparation too learn new issues. So, it provides better feedback for effectiveness of teaching.

4. Japan:

In Japan; new lesson program; computer usage starts from elementary level and used widely through high school. From stag 5 to higher ones; calculator is used significantly in teaching. Based on 3rd time international science and mathematics study ; it seems that Japanese students are weary from math, this thought has been in increased among students and a plan should be considered for that. It has been emphasis in using calculator and computer but it seems that they aren't applied enough at classes and teachers should be teacher more in this field.

Japanese text books are written by a group of math teachers and mathematicians. There which text books from list production approved by education ministry should be selected at all stages; teacher is expected to use textbooks for teaching and teachers use textbooks to review and strange then knowledge's ; basic skills , and summarizing grammar. Books use a problem solving process which includes 5 question, description examples, exercises and applications. They apply veal life issues for introducing math concepts. Program guidelines emphasize on balance between computational techniques and concept develop but teachers focus more on technique in their teaching. Although mathematics is a uniform science but teacher's tendency to issues is separable and this tendency has been grown in high schools. It is recommended to use calculator from stage 5. but teachers seldom use it [13].

5. South Korea :

South Korean textbooks during 10 years ago; have been change significantly . these book are published by special institutions under education ministry supervision. Book writer usually; are composed of teachers; educations specialists and subject specialists. Open answer questions in external examinations such as: national evaluation and entrance exam have been increased. Teachers try to focus on group works. For easier learning ; there are some home work to review goals at the end of each lesson. Al though calculator has been a part of south Korean daily life; but students can't use them it school. Computer serene, programs and their applications aren't essential in math programs and are teaches separate issues. In Korea; national evaluation is used for university entrance. Students should participate in entrance exam of their educational zone [8].

6. Canada:

According to Taylor , Canada has a federal government and several provincial governments That education is operated by the counties. Elementary students attend school 30 hours a week that 23 to 24 hours , the time spent on teaching and playing the rest of the day is lunch and recess. In Canada, There may be with more than 40 students in a class, However, the average number of students in 94-1993 , Quebec , for a period of 27 primary and 30 secondary school students . For 27 primary and 30 secondary school students. Elective courses in mathematics , usually are offered at the high school level [13].

The following table compares the situation in mathematics is active in various countries.

Compared to other countries in math	Country
Math course designed at national level, Changes based on learning theories, Edited elementary school textbooks	Iran
Textbooks produced by businesses, A large number of books in the series High School Mathematics Project is smp, The widespread availability of computers.	England
Greater emphasis on math concepts and the ability to apply them to solve math problems, Emphasis on the driving method	Singapore
Computer use of primary, Use of calculators in teaching fifth grade onwards, Japanese textbooks that include the author's mathematics educators, mathematicians and teachers, written and published by a commercial publisher to be.	Japan
Books published by the specialized agencies under the Ministry of Education to work, Use open-ended questions in external, examinations	South Korea
education is operated by the counties, Elementary students attend school 30 hours a week, Elective courses in mathematics , usually are offered at the high school level .	Canada

Proposals and solutions:

According to other countries experience on math teaching; these points are proposed to remove education weakness in math:

We can globate acclaim about education weakness factors that attention introduction of famous mathematicians of Iran; great attention to mind game which absorb children toward math should be considered. Outhits point; I should say that one most sense lack of something in order to think about it and then try to discover it. Non plasticity of programs versus global advances math can be one factor to challenge this course. But generally these points should be more considered in designing math textbooks:

- 1) Student goes ahead step by step, it means that teaching gets student involve in observing; explaining; proving and interpreting.
- 2) Math games should be used for absorbing students. Reinforcing the information learned in class is not always the easiest task for teachers, but math games provide the opportunity to make the lesson interesting and encourage students to remember the concepts. Depending on the class size, computer availability and the lesson students are learning, games can vary. Teachers can use computer games for the particular skills or can opt to use class games to get the students interested in the information(). Also The use of blocks, fruits, balls or other manipulation tools help students learn the basics of place value, addition, subtraction and other areas of basic math. According to Kate Nonesuch on the National Adult Learning Database of Canada, manipulation tools help slow down the process of problem solving so that students are able to fully understand the information([14]).
- 3) Text book's examples should be more highlighted to recognize math importance for example , now in our country; there is no Rial currency in exchange.
- 4) In teaching each math concept; one problem should be : provided for student to force them think before introduce it; because children thinking is one of the most important goal of math.
- 5) 1 or 2 discussions should be involved in each educational level which teach select them.

6) Reducing content's math text books because teachers really are obliged to use conventional method to teach student's in order to finish textbooks.

7) Revision of math textbooks content especially stage4 which is not continued together.

Also; there are some solutions for teaching math:

1- encouraging students while teaching math in order to increase children's motivate.

2- using consultants at elementary schools and recognizing students who have really problems in learning math.

3- recognizing children's problem learning (maybe one student has problem in space relation or understanding figures concepts). Teacher tries to reduce problems by doing extra programs. In this context, the process is repeated .Repetition is a simple tool that makes it easier for students to master the concepts, basics and information without wasting time. According to the University of Minnesota, daily re-looping or reviews will bring the previous lesson back into the spotlight and allow teachers to build on those previous skills. The strategy of repetition is commonly used in later education to remember formulas, but it can also work in early education to teach key concepts, numbers and other building blocks[15].

4- selecting appropriate teaching method which forces students to think more

5- we should change methods or combine some methods when teaching method isn't success full in class.

6- offering new teaching methods to teachers through math magazines or over teaching magazines[16].

7- introducing math teaching workshops and discussions about teaching various parts of mathematics at different stages.

8- welcoming innovative methods for each concept or parts of mathematics and trying to issue them.

9- successful teachers are ones that are interested in students and classes and don't get angry with student's faults[17].

10- recognizing problematic students in teaching and planning for them.

11- using computer at classes can help elementary students to learn math concepts because computers have variety programs[18].

12- parent's justification to help children while doing math exercises and more coordination with class and school[19].

13- it is better for elementary mathematics to introduce problems which are exists in nature and intellectual problem shouldn't be used because intellect methods approach students to solve problem[16].

Conclusion:

Despite changes and modifications which are done in our elementary and secondary tags; these programs should be revised again performance and contently.

Time exam in 2007 was a good opportunity to evaluate course programs and we can evaluate based on its results. So; we should seek methods to enhance genera in order to bring proper results for the country. Generally; some contrivances should be considered for. Teachers to learn special teaching about new methods in order to teach sciences. So; it is essential to revise educational content of teacher nurturing centers. Also; possibility of schemes and innovative technologies usage is evaluated. Program's flexibility against math universe developments is important factor in math textbooks.

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