

A program for reducing teacher's resistance to changes in curriculum in centralized education systems. An experience on changes of mathematics text books in Iran based on distinction results.

Zohreh Ketabdar, M.Sc Math Education Zohrehke_2002@yahoo.com

Abstract:

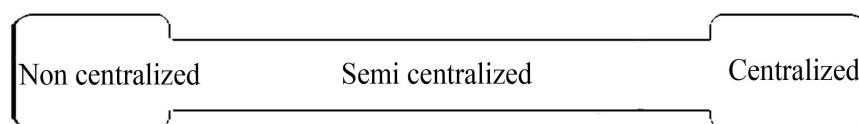
Curricula in concentrated educational systems are prepared from an upper-stream reference and hand over teachers' disposal. Curricula in Iran are compiled in the so-called math curriculum development office and then put at the disposal of teachers. The researches in this regard show that such plans provide some resistance against executing it which are named teacher-proof programs, even it changed to some extent for acceptance, its execution is suspicious. This research first explains how math books of middle grade were changed as a result of investigations on TIMSS result in year 1995. These investigations show Iranian Books are weakness in problem solving methods as Polya had said. And so curricula developers in Iran tried to integrate Polya's method in math books and changed curricula based these framework.

Then, it shows how teachers treated these changes. The finding of analyzing the data has been collected in this research through observations and interviews. It is intended that teachers resist against these changes. Finally according to this research, we suggest a model which we refer if it is used through concentrated educational system, we could expect teachers tolerance against the changes would be decreased and so compiled curricula further matched to executed curricula.

Key words: changes in curriculum – science – attitude – skill – problem solving – job training during service

Introduction:

Three types of education system could be recognized in different countries.



In centralized education systems curriculums as well as contents of books and methods of teaching is planned at a central governing organization such as a ministry or another government body.

In non-centralized education systems, teachers are free to plan their own method of teaching as long as it remains within a previously agreed upon framework. They even can choose the books and instruction material for teaching

In Iran education is just like other aspects of life centralized and text books are surrogates curriculum and they are prepared by ((The office of programming and compiling text books)) which itself is a subsidiary unit of ((organization for educational planning and research)).

The office of programming and compiling text books is responsible for preparing text as well as teaching plans for primary, secondary and high school levels.

Teachers are obliged to teach these books. Text book preparation is a lengthy process because only a handful of specialists are working on books and because they are responsible for preparation of books for all levels. Mathematics has a permanent presence in every curriculum and because of its importance in proper education these experts have been reviewed and modified math teaching programs. Changes have been made as to the volume, perspective, teaching plan etc. **Key words:** changes in curriculum – science – attitude – skill – problem solving – job training during service

Changes in teaching plans

Three types of teaching system could be recognized here.

A) Loyal execution scheme: In this scheme teacher should proceed exactly as the pre-planned teaching program dictates to him/her and he/she could not and should not exert any changes while he/she is implementing this program. This scheme is also called instructor-resistant scheme.

B) Half-complying scheme is a scheme in which the teachers can modify the teaching program in a way that it becomes more compatible to his/her pack of students. This scheme is also called Active Execution Scheme.

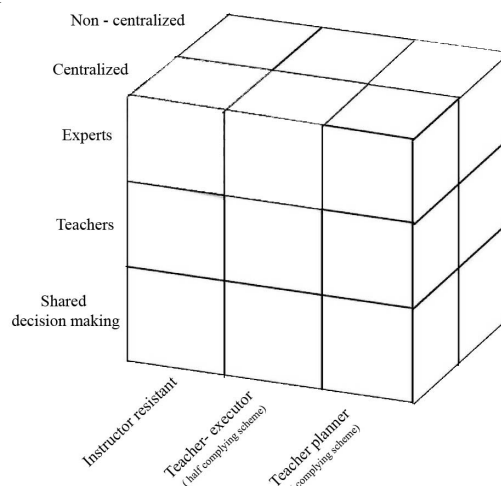
C) Complying scheme. Here the teacher not only can modify the plan but can also prepare a new teaching program and compile instruction material which he or she deems fit for his/her class. This is also called planner teacher scheme and here

changes in teaching plan is made along with its execution. Teachers react to changes in teaching plans in 4 different ways: they resist, they comply, they co-operate and they lead.

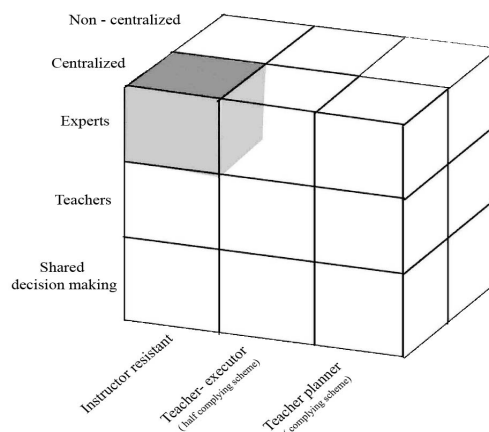
A teaching plan consists of 4 components namely targets, contents, methods of instruction and evaluation. Reforming these four parts seems absolutely imperative and because in Iran text books are considered surrogates for curriculum reforming text books should be considered a very essential task.

Theoretical approaches to the process of educational planning

Educational planning consists of 3 main theoretical components. Experts in the field of educational planning have sought to offer appropriate models for their approaches.



Among them Short has offered a relatively simple model based on his understanding of different theories of development of educational planning. His model is called Cubic Educational Model and in Iran it is usually presented in the following form:



Because of the vertical gap between decision making bodies and execution units in Iran development of a plan which is not sensitive to teachers' attitudes could be easily expected. Recent changes in secondary school math text books are mainly related to implementation of 1) Polya method and 2) super cognitive learning.

New plans call for new requirements and those who execute these new plans should possess the required skills. These skills could be taught in relevant training courses.

A positive attitude toward these new plans is even more important than begin well versed in them. Willingness of those who execute plans will create an appropriate environment for them to improve their knowledge and skill.

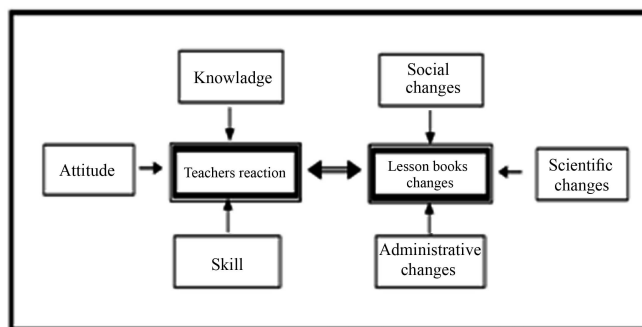
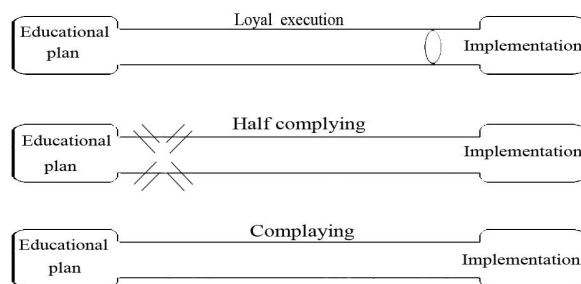
Conservative nature of man always compels him to resist change and to oppose new plans and so it is very important to convince him that the new procedure is worth implementing. The following recommendations may be of use in this regard

- 1- Selecting those who agree with new plans as well as have adequate knowledge of them as implementers.
- 2- Educating those who are due to take part in implementation of new plans.

3- Involving them in evaluation process and detection of weaknesses and shortcomings.

4- Involving them in preparation of new plans for further changes

A combination of all or some of the above may be required to achieve the desired degree of co-operation. In any case, finding a way to persuade those who execute a plan that the plan is worth executing is imperative. In this regard the theoretical model for our study consists of a foundation and a body as depicted by the following diagram.



Research Theory Model

Process of change of educational plan

Most researchers divide the changing process into three main phases. These phases could be termed as: initiation, implementation and evaluation.

Words such as preparation, distribution, dispensing, dispensing and receiving are related to the initiation phase.

The most important concept related to the second phase (implementation) is execution. Execution could be done with total loyalty or may consist of compliance with constraints and alteration of procedures and routes.

Evaluation phase is when changes have been completely incorporated in the system and their effect could be readily observed.

Research method

Our method of research is qualitative² and the research is conducted through following steps

- 1-defining different aspects of the problem
- 2-defining methods of data collection
- 3-finding sources of information
- 4-collecting data
- 5-Description and analysis of data using inferential methods.
- 6-Conclusions and recommendations

We have come across changes in secondary school math text books ourselves and we were haunted by questions as to usefulness of these changes and to put the matter in a regulated frame work using previous theoretical studies we prepared questionnaires and conducted interviews with teachers and head-masters of a number of schools. Questions asked in these interviews were some pre-determined and some impromptu as dictated by previous answers given by a particular interviewee. Data analysis was performed based on 3 theoretical variables (knowledge, attitude and skill) and through inferential methods.

3- Education Of Research And Introduction Meredith D.Gall, Walter R.Borg, Joyce P.Gall, Sixth.Ed (2006)

Those who participated in the study

23 secondary school math teachers from an Iranian town (other than Tehran) were brought to our study. 3 of them were later put aside because of their insufficient co-operation. Two of the interviewees were head-master as well as teachers. Because we were mainly focused on changes made to text books in 2002 we have selected teachers with a teaching record spanning 7 years at least and up to 30 years. These teachers were teaching at public as well as private and distinguished schools. In one of sessions an experienced secondary school head master (my own mother) and some university students of mathematics as well as math faculty members and some members of the House of Math of the town of Saveh were present.

Method for data collection

Improvised questions were also asked by an interviewer during an interview. Each interview took between 45 and 120 minutes and interviews were done at schools as well as the math faculty office of the town's university and at the House of Math of Saveh. Two interviews were conducted at interviewees' homes. Interviews were conducted between December 2007 and March 2008 and were recorded on camera. Afterwards researchers watched and analyzed the interviews.

Tools for gathering data

Data was gathered through semi-structured interviews with teachers. Some teachers were interviewed in more than one session and main questions were always prepared in advance. During interviews and also during classes taught by interviewees notes were recorded by the researcher, also notes were handed over to the researcher by interviewees containing points which interviewees deemed useful as to the propose of the research.

Content of interviews

Some questions were concerned with interviewees' knowledge of the changes made to secondary school math text books. (The following questions for instance were meant to indicate the superficial knowledge level of interviewees regarding the changes)

- * When were the last changes made to secondary school math text books?
- * What parts were changed then?
- * What method of problem solving was installed in the text book while modifications were done?

(The following questions were concerned with interviewees recognition and understanding of the logic behind these changes)

- * Why these changes were made to secondary school math text books?
- * What aim was sought by making these changes?
- * What benefits were gained through these changes?
- * What is the negative side of these changes?

Some questions were concerned with interviewees' attitudes towards changes. Examples are:

- * Are you satisfied with changes made to secondary school math text books?
- * Do you think changes were worth implementing?
- * Do you see a need for further changes?

Some questions were concerned with the skills possessed by each interviewee to execute his or her teaching based on the new modified text book.

Examples are:

- * How do you incorporate changes in your teaching style?
- * Do you use the new problem solving method while teaching.

Method of analysis of data

To analyze the gathered data we separated and codified all points raised during filmed or tape-recorded interviews or offered in notes handed over by interviewees. On the basis of the theoretical model used in our research and discussed earlier we differentiated points pertaining to each of the three main subjects : a teacher's knowledge of the changes, attitude toward the changes and skill to implement the changes in his or her teaching. In a later review a fourth subject was recognized and incorporated as a variable. This variable was ((action taken by the subjects)). This was not due to any inadequacy of initial frame work and the decision was adopted only to make our study more rigorous and more complete.

The story telling analysis was used to enhance the validity of results. Based on the research it could be broadly stated that teacher's knowledge of changes made to secondary school math text books is inadequate and even those who possess such knowledge are not fully aware of the logic behind these changes. It was confirmed that those teachers with a more positive attitude toward these changes implement them in a more satisfactory way.

Results

Secondary school level is very important because it bridges primary and high school levels. Recent modifications in secondary school books have been based on results gathered from TIMSS³.

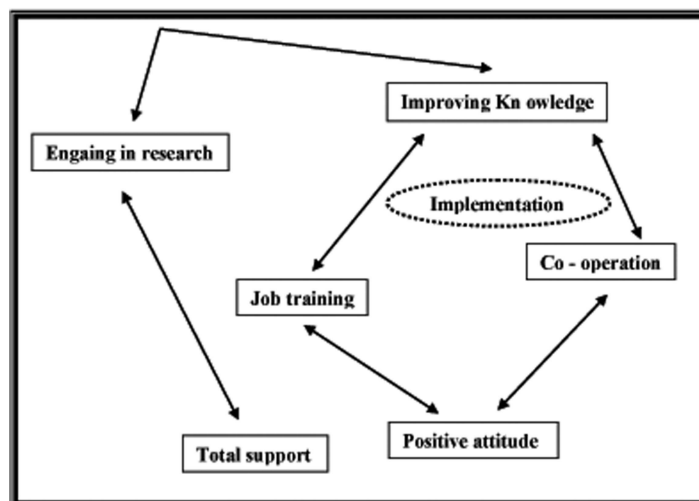
The main emphasis is on solving problems through Polya method.

According to (parsa-2005) teachers at present are not very familiar with Polya method or how to execute this method in their classes or how to use this method in solving math problems and they teach the new content in the old way. Some of these teachers resist the call for a change of ways and practices and it's partly because they are better tuned to the old method and have acquired necessary skills for its execution through their teaching experience. They feel more at home with the old model and feel somehow attached to it. Something however should be done in this regard.

One question is what would be the optimum model for reducing the resistance shown by some teachers to such changes and another question is how such a model could be implemented in Iran.

Of course it is not always easy to change some one's attitude toward something and again one way to achieve it is to educate teachers on the subject of changes in text books. Educating teachers could be done through on-the-job training workshop, distribution of booklets and pamphlets and the like. Another effective way of securing teachers' support of changes would be to engage them in the process of determining and planning changes. Most teachers themselves iterate that such involvement would probably improve the attitude they later may have toward these changes.

Considering the current situation we recommend that specialized training workshop with differentiated subjects such as organizational behavior, awareness of changes, resistance to change, using experience and opinions of older, more experienced teachers and other likewise titled workshops be held at relevant institutes to enhance both willingness and ability of teachers to comply with changes.



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