Evolution of the Aim of Education Policy into Curricular Materials and the Status of Teachers' Awareness and Classroom Practice

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Abstract: A new Education and Training Policy was introduced in Ethiopia in 1994. The policy is identified, among many others, with the tag of problem solving education and citizen. This study scrutinized how the policy's aim of developing problem solving capacity is translated into curricular materials and teaching practices by addressing social studies and science textbooks and 47 teachers' awareness and practices. Curriculum organizational constructs such as problem situated learning, allowing students to predict, searching out knowledge, etc. were applied to this end. Results revealed that social studies and science textbooks, albeit better in comparison to social studies, were poorly aligned with requirements for developing problem solving capacity. None of the topics of these textbooks presents components of problem solving curriculum. All address the components in a disjointed manner. Teachers' awareness of how to develop problem solving capacity is characterized by uncertainty. Teachers' practice also deviates a great deal from instructional elements of problem solving. The development of problem solving capacity does not therefore seem to be properly met by textbooks' organizations teachers' awareness and practice. Suggestions for the betterment of these problems are forwarded.

Contextual and Theoretical Basis of the Study

Requirements for Evolution of Education Policy into Practice: The Case of Developing Problem Solving Capacity

Lowham (1995, p.95) asserts, "While there is an extensive research domain focused upon policy development and another focused upon the many aspects of the implementation, there are few published studies that attempt to bridge these research bases."

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With the widely agreed on view that change is a process rather than an event (Hall and Hord, 1987), the study of policy to practice continuum is highly crucial. The above quotation marks the scarcity of such kind of studies. Yet, policy - practice continuum study is an apt measure at times of educational reform as is the case in Ethiopia.

Following the 1994 educational reform, development of the physical and problem solving capacity of individuals has been a valued, aim for the Ethiopian Education and Training Policy (Ministry of Education - henceforth MoE, 1994). As aims are very broad and philosophical, they dictate educational changes and do little in indicating whether or not changes are occurring. Thus, they deserve to be translated into goals and objectives that would clearly indicate structural, material, role and behavioral amendments which fit with requirements of broader aims (Ebel and Frisbie, 1991).

Schools are chiefly responsible for the realization of the policy, and because of this, curricula reform has been going on since the formulation of the policy. The former curricula had been replaced with new curricula for all subjects and grade levels. A structural alteration of 6-4-2 to 8-2-2 has also been applied. These reforms and alterations are presumed to be in tune with the aims of the policy.

The development of problem solver citizens' aim of the policy decides what the educational goals and objectives of the schools should be. Because of this, the application of a problem and inquiry centered approach in curricula materials development and in the teaching learning process is an indispensable measure (Tinzman, Jones, & Pierce, 1992). Correspondingly, the new policy explicitly indicates that teaching has to center on inquiry oriented approach and "the preparation of curriculum will be based on the stated objectives (aims) of education, ensuring that the relevant standard and the expected profile of the students are achieved," (MoE, 1994, p.12). In addition, "It [the policy] emphasizes the development of problem solving capacity and culture in the content of education, curriculum structure and approach, focusing on the acquisition of scientific knowledge and practicum"

(MoE, 1994, p.4). Certainly, when there are no directly designed courses for developing problem solving, integrating problem solving-skills in content areas such as Language studies, Mathematics, Social Studies and Sciences could be an alternative means. Seen against the controversy that problem solving skills may not be generalized to other circumstances when they are taught in isolation from subject matter (Cotton, 1995), the approach to integrate them in content areas appears more versatile. Here it seems apt to overview how education in general and curriculum in particular could assume this challenging responsibility.

Problem solving is a process of reducing or closing a perceived problem gap (Collins, 1992). It is a process of transforming incomplete form of knowledge into complete form. Gagne, as cited in Cotton (1995, p. 156), defined problem solving as: "The application of old rules to a new situation and the process of ordered thinking to come up with unique solutions." This definition, in the context of the education policy, implies the process of acquiring thinking skills in the classroom that would be applied to solving the problems of the society.

Notwithstanding the complexity to transfer problem solving skills practiced and acquired in classrooms into real life situations and the controversy of transferability, the nucleus of the education policy rests on the belief that one's engagement in problem solving thinking in classrooms improves the ability to cope with social problems in daily life situation. Earlier research studies (Platt and Spivak, 1972; Spivack and Shure, 1974 cited in McClure, Chinsky and Larcen, 1978) also indicated a significant relationship between cognitive performance on hypothetical social problems and ratings in social adjustment in later life. Invaluable elements in the venture to develop problem solving capacity are the design of curriculum materials and the provision of instruction in tune with problem solving skills (Elliott, 1998; McNeil, 1996). Beyer, cited in Ogle (1992) underlined that to overcome the difficulty to acquire and apply problem- solving skills in life situations, the consecutive repetition of these skills in various subjects and under diversified contents is indispensable.

Thus, to accomplish the development of problem solving capacity, textbooks, teachers' guides, and the syllabi have to be prepared on scientific and research grounds. Underscoring the tremendous bearing curriculum materials have on teachers' role and methods used in classrooms, Elliott (1998, p. 22) states, "The stance of knowledge marked down in curricula either invites teachers to express and extend their present knowledge to students, or they imprison teachers as transmission devices which represent knowledge as inert information." Hence, though it is an accepted fact that the method of teaching could be determined by curricula materials, it is also worth noting that content organization for problem solving textbooks has to be different from curricula for direct instruction.

Similarly, the policy explicitly indicated that curricular materials would be prepared by considering international standards and national aims to commensurate them with problem solving education (MoE, 1994). Yet, many of the curricular materials in many regions of Ethiopia were prepared through bid system whereby the least bidders (with the required qualifications) were usually winners of the competition. It is prudent and interesting to look into how these least bidders could establish a smooth link between the aim of the policy and the preparation of curricular materials.

Curriculum/Textbook Organization for Developing Problem Solving Capacity

At a general level there is one indication that the same kind of content can be taught through direct instruction and problem solving depending on how the contents are organized. In view of this, Elliott (1998, p. 22-23) notes:

> Syllabus organizes information in content categories. It enables teachers to transmit large amount of information in an efficient and orderly way. But when knowledge is represented as structure which supports inquiry, the traditional syllabus is quite inappropriate form of content organization. This mode of representing knowledge is incompatible with a requirement for teachers to cover large amount of information. It requires a more parsimonious organization of content around central questions and problems which define the various disciplines by which human beings have attempted to make sense of their experiences.

What is very decisive, therefore, in a curriculum that intends to develop problem solving capacity is how contents are organized in students' textbooks and teachers' guides. Textbooks for such purposes should put students who engage in identifying and applying what they know and experience as actors for solving problems and constructing knowledge through the process of application, analysis, synthesis, and evaluation (Bloster, 1988). The textbook should give students an opportunity to discover knowledge by themselves rather than imposing readymade knowledge on them. This raises students' creativity and inquisitiveness. If so, what should content organization for developing problem solving skills look like?

Newman (1992), for example, states that developing problem solving ability requires an in-depth study and sustained concentration on a limited number of topics or questions. Collins (1992) also noted that depth rather than coverage is the means for developing problem solving capacity. He recommended the inclusion of matrices, imagery, back reference problems, and omissions to develop thinking ability of students. Similarly, McNeil (1996) stressed that meta-cognitive and cognitive strategies are the main tools for developing problem solving in curricula, for problem solving students learn the heuristics of diagramming, breaking a problem into sub elements and working backward. This in turn demands learning experiences for problem solving. In situations where in problems are not completely solved, all information and knowledge is not fed to the students and no single correct answer exists.

In their extensive research on developing curricula for thinking, Tinzman, Jones and Pierce (1992) came up with thematic curricula that have six components: problem situated learning, phases of learning, recursivity, graphic organizer, meta-cognition and collaboration. Problem situated learning refers to the provision of real world problems as authentic contents. At this stage, students get the opportunity to confront problems that they know very well or contents of global issues organized in the form of problems and questions. In Ethiopia problems such as poverty, deforestation, soil erosion, malaria and unemployment could be used. The foundation for the inclusion of real world problems as contents stems from

the belief that problems have usually more than one solution. They also involve the analysis, synthesis and evaluation of more than one content area. This promotes students thinking process. Once such kinds of topics are indicated, students have to be allowed to pass through three phases of learning: focusing, finding out and back references. In focusing, textbooks and students have to set purposes, questions and make predictions about the outcome. This could be followed by learners' engagement in reading, discussing and organizing their experiences that would allow them to take part in thinking. This is the part in which students go through different stages of higher order thinking to discover and construct knowledge which is purposely missed out from texts.

In back reference, students have to be allowed to summarize, reflect on what they have learned, ask new questions and apply what they have learned to new situations. This promotes transfer of learning and gives an opportunity to examine how students apply what they have learnt in new situations and problems. Success, however, depends on the kind of questions students are exposed to. Process questions are more effective than content questions (factual questions) in developing and stimulating students thinking (Cruickshank, Metcalf, and Bainer, 1995).

Recursivity is the process of application of what students have learnt to new situations or thinking about what students will learn. To set optimum environment for reflection and thinking, Tinzman, Jones and Pierce (1992) suggested graphic organizers and metacognition as integral components of curricular materials. Graphic organizers are visual illustration of verbal statements with a corresponding set of questions or categories that are important to understand a given topic. They are effective devices for students to record their prior knowledge when they begin a unit, and take notes as they read and summarize information at the end of a unit. According to Tinzman, Jones, and Pierce (1992) the rationale to use graphic organizers rather than linear outlining to represent and organize information stems from the dubiousness that reading, writing and thinking follow a sequential and linear fashion. Instead of this traditional linear representation

of information, non-linear ways of representing information in matrices, cycles, and sequences has been found more effective in reflecting the structure of information, clarifying the relationship among ideas and concepts and thereby increasing retention and meaningfulness of learning material (Jones, Pierce, and Hunter, 1988 cited in Tinzman, Jones and Pierce, 1992).

To support the effectiveness of following these strategies, Tinzman, Jones, and Pierce (1992) indicated that experimental group students who were taught with material developed in the form of breakthroughs (graphics, metacognition, problem situated learning, open ended questions) demonstrated a significant gain in cognitive thinking ability in post-tests as opposed to control group students who were taught in the traditional linear organization of information.

Statement of the Problem

It appears that developing problem solving capacity largely depends on the extent to which textbooks are molded following the procedures and organization styles discussed earlier in this text. Based on the contention that contents and process of learning are contents of problem solving curriculum, organizing textbooks through questions, problems and concepts that support inquiry rather than simple explanatory descriptions is essential (Britz, 1993).

Few studies (Ambaye, 1999; Metasebia, 1999; Haimanot, 2000; Akalewold, 2005) attempted to scrutinize the proper translation of aims of the policy into the development of syllabi, textbooks, teachers' guides and actual classroom practice of teachers. In evaluating the match between the Education and Training Policy and the curricula of primary school in region 14, Ambaye (1999) concluded that contents of grade five science syllabus and objectives of the various subject curricula of primary school are in line with the aims of the policy. It sounds necessary, however, to deeply examine Ambaye's conclusion that contents in science syllabus are in line with the education policy's aims, particularly developing problem solving capacity, considering the rationale used for conclusion ─ Ambaye's rationale for the conclusion he

made stems from the benefit that contents are related to local resources. The same kind of content can be organized in different ways for problem solving or direct instruction (Elliott, 1998). This carries with it the implication that relating content to local resources is not by itself sufficient to meet the demand of a problem centered curriculum. The contents for problem solving can be from local resources or students experiences. The crux of the matter still rests on how these contents are organized in curricular materials.

Metasebia (1999) and Haimanot (2000) evaluated the adequacy of Grades 7 and 8 mathematics textbooks' exercises in developing problem solving capacity. Both reported that the majority of the exercises are factual types that develop memorization of rules. Ambaye (1999) also reported that mathematics questions indicated in grade 5 textbook mainly demand recall. Ambaye's (1999) study of science syllabus considered the relevance of contents to students' need and experience which by itself does not qualify appropriateness for problem solving. Akalewold (2005) examined the adequacy of laboratory activities in general secondary school biology textbooks to foster problem solving ability of students and reported the laboratory activities dwell largely on lower level cognitive skills that scantily contribute to the development of students' problem solving ability. The few studies, made so far seem to bind problem solving capacity with mathematics and science. Besides, none has addressed the content organization of textbooks in general and that of the social studies in particular.

On top of this, amending curricular materials in line with the requirements of problem solving curriculum has little to do, if at all, with developing thinking ability in the absence of teachers who transpire them in classrooms. Indeed, curricular reform at most rests on the practice of teachers (Elliott, 1998, McNeil, 1996, Guskey, 1988). Hence what has to come concurrently with the alteration of curricular materials for developing problem solving ability is the role and behavioral adjustment of teachers (Fullan and Pomfret, 1977). Teachers could no more be information dispensers but facilitators and brokers (Casey and Hawson, 1993). And students are not receivers of

information and knowledge but they are inquirers and formulators. This is what the education and training policy intends to achieve. To these ends, teachers have to concentrate on reasoning process of students, pose open-ended problems to students and allow them to predict, discover and evaluate their own ideas. Students have to be aware of a problem. They should define and delimit the problem, gather evidence to solve the problem, hypothesize solutions and test them (Clarrk and Starr, 1986). Moreover, Polya's (1957) model of mathematical problem solving has been adapted to the teaching of problem solving in science, social studies, and language arts. Polya's model follows four steps: Understand the problem, devise a plan, carry out the plan, and look back and explain the solution. These steps are similar with the components mentioned earlier by other scholars.

To recap, provision of daily life problems, inclusion of open-ended questions, matrices, diagrams, omissions, back references, and prediction are inalienable elements of curricula materials and teaching (McNeil, 1996; Tinzman, Jones, and Pierce, 1992; Collins, 1992) to develop the students' problem solving abilities. These are not ends by themselves, however. As a branch of cognitive psychology problem solving is a mental process of filling a gap or reaching a desired state. In Costa's view (1992, p. 175), "The process of thinking must become the content of curriculum… content must be selected because of its contribution to the thinking process." Thinking processes are believed to be applied when students come across problems in daily life situations. A drift in one of the cases could deter the aim of the policy and cutoff the policy practice continuum, leaving in vain material and human resources committed to this end. This is what makes it necessary for us to examine students' textbooks and teachers' awareness and practice in light of the requirements for developing problem solving ability. This study, therefore, intends to seek answers to the following questions:

1. Are contents of grades 5 to 8 social studies and science textbooks' organized in an appropriate way to develop students' problem solving abilities?
    a. Do the textbooks include contents related to real world problems?
    b. Do they provide opportunity for students to find out and organize knowledge by themselves rather than describing and explaining?
    c. Do the textbooks provide opportunity to predict and summarize learning materials by posing open-ended and process questions?
    d. Do they sufficiently incorporate graphics and omissions?

2. How competent do teachers feel in designing and implementing a problem-centered approach to teaching?
3. How often do teachers demonstrate dimensions of problem-centered approach to teaching?
4. Do teachers have adequate awareness about how problem solving capacity could be developed?
5. Do textbooks' organizational variations in integrating components of problem solving curriculum affect teachers practice in demonstrating problem-centered approach to teaching?

Answers to these questions might be helpful in preparing future editions of textbooks and in addressing teachers need through intervention strategies and pre-service training.

Methodology

The Subjects of the Study

The subjects of the study were 47 grades 5-8 teachers of social studies and science (biology for grades 7&8) in Bahir Dar Zuria Woreda public schools. The teachers were included in the study through comprehensive sampling technique. Besides, grades 5-8 social studies and science textbooks (biology for grades 7 & 8) of Amhara National Regional State (editions that were in use in 2001) were used as sources of information. These subjects were the core subjects that encompass daily life problems. They create conducive contexts for applying problem-centered approach in content organization and teaching learning process. Goodlad (1984) also asserted that one major aim of social studies education is developing skill of solving societal problems.

Data Gathering Instruments and Procedures

Document Analysis*:* Grades 5-8 textbooks of social studies and science were analyzed through the parameters of a problem-centered curriculum. The units of analysis were topic or subtopic indicated as heading and questions incorporated for practice and summary. The main parameters or categories were provision for problem situated learning, focusing, finding out, back reference, and graphics (matrices and diagrams) adapted from research related to curriculum for social studies, language and science (Tinzman, Jones, and Pierce, 1992; Mclure, Chinsky, and Larcen, 1978; Ogle, 1992). The dominant categories were taken from works of Tinzman, Jones and Pierce (1992). This is because their curriculum model designed by these educators was meant for achieving the general aim of 'Changing Societal Need and Problems' which concords with the basic premise of this study.

a. Problem Situated Learning refers to topics' relation with real world problems. Topics were judged based on whether or not they are related to the experience of students or real life situations and pose a problem to students.

b. Focusing refers to asking questions for brainstorming and provisions of directions at the beginning of a topic. A reading of written texts stated at the beginning of each heading/topic was made to assess the inclusion of questions and purposes to focus students toward learning material.
c. Finding out refers to ways students are exposed to knowledge such as describing, explaining, discussing, experimenting, organizing solutions by themselves, etc. The ways topics were presented to students were assessed. There was a possibility to find more than one activity in each topic. Hence the activities in each topic were counted.
d. Application lesson refers to whether the topic asks students to summarize, reflect on what they have learned and apply what they have learned to new situation. Exercises or questions in the textbooks were analyzed into content and process questions. Content questions are questions that ask students to recall information. Process questions are questions that demand students to apply, analyze, and evaluate ideas. They usually demand students to recall knowledge not as an end but as a means to search for other solution.
e. Graphic organizers refer to matrices, cycles and charts that ask students to complete lacking information or summarize given information. They are further classified into complete graphics, semi- complete graphics and incomplete graphics based on the amount of information presented within each graphics. The number and kind of graphic organizers available in the whole textbooks were assessed. The analysis was made by the researcher.

Observation Checklist*:* An observation checklist with a rating scale of frequently (2), sometimes (1), and not at all (0) was used to examine teachers practice in promoting problem-centered approach to teaching. Ten items were developed and used to observe social studies teachers' behavior in promoting students' thinking during lessons. Ideas obtained from the reviewed related literature were used in the development of the items in the classroom observation checklist. Some items were also adapted from the checklist prepared by Tinzman, et al (1992). Items that are not workable in Ethiopian situation such as the use of technologies and the provision of field

experiences were not included. Twenty teachers, 5 teaching biology in grades 7 and 8, 5 teaching science in grades 5 and 6, and 10 teaching social studies from grades 5 to 8, were observed from the total subjects. Each teacher was asked to identify three topics which he/she believed are related to daily life problems and suitable to apply problem-centered teaching three months before classroom observation. This was done because not all chapters lend themselves to the approach and give teachers opportunities to show components of a problem-centered approach.

The researcher and his assistant* observed lessons two times. I observed one lesson and my assistant observed another lesson. This means that we observed two of the three lessons the teachers identified as convenient lessons for the application of problem-centered instructions. Inter-observer agreement was found to be 0.93. Besides, each teacher was observed on the steps of Polya's (1957) problem solving model after it was adapted to fit the teaching of social studies and science. Though the model was meant for the teaching of mathematics at the beginning, recent studies on problem solving in social studies and language arts have been adapted and employed (Ogle, 1992). The steps of observation were:

1. Providing for Problem: this refers to whether or not teachers give students contents as problems to look for solutions.
2. Devising a Plan and Searching for Solutions: this refers to whether teachers allow students to design their own way to solve the provided problem.
3. Explaining and Checking: this means allowing students to see the relevance and feasibility of their solutions. A check list with 'Yes' or 'No' category was used to indicate the presence or absence of these three items.

* My assistant observer was a student in the final year in the Department of History. He had a diploma in Biology.

Questionnaire: questionnaire that had three parts was administered to teachers. The first part of the questionnaire was needed to gather background information about teachers and their awareness about the Education and Training Policy in general, and problem solving capacity in particular. The second part of the questionnaire asked teachers' awareness about instructional activities related to developing problem solving capacity. Teachers were asked to rate instructional activities as 'Very important' (4), 'Important' (3), 'Not so important' (2) and 'Not important at all' (1) in relation to perceived benefit they believe activities have in developing problem solving capacity. Part three of the questionnaire required teachers to record their perceived competence to design and implement teaching techniques related to problem-centered approach in one of four categories. The categories were

4. I feel very competent and can do it easily.
3. I feel competent and can do it.
2. I feel less competent and have difficulty.
1. I don't feel competent and cannot do it.

Techniques of Data Analysis

Frequency tabulations, percentages, t-test, chi-square, and text analysis were used to analyze the data. Text analysis was used to describe how contents were organized and presented in the textbooks. Narrations and descriptions of textbook' contents were used to assess curricula organization in light of the yardsticks of problem solving curriculum. Frequency tabulations and percentages were used to describe the extent to which textbooks address features necessary for developing problem solving capacity and teachers' assessment of the appropriateness of the text books. T-test was employed to compare teachers' perceived importance rating of instructional elements for developing problem solving capacity and their self-reported competence to apply these elements. There was one group of teachers in the study, and because of this, the mean value of the teachers' ratings were compared against expected mean value of 2.5 using one sample t-test. The expected mean value or test value was set by taking the

average of the possible maximum and minimum values (4+1/2). Though the teachers were classified as social studies and science teachers for convenience of observing their practice, there were teachers who were teaching both science and social studies. Chi-square was used to examine whether there is association between the subjects the teachers teach (science and social studies) and the application of problem solving instructional components.

Presentation of Results

Results of Textbooks Analysis

One important criterion to judge the adequacy of textbooks for developing problem solving capacity is the presence of contents that are amenable to employ problem solving teaching.

Table 1: Contents of Textbooks Related to Actual Problems and Students Experience

Subjects	Grades	Actual Problems	Others	Total
Social Studies	5	4	79	83
	6	4	100	104
	7	6	111	117
	8	8	121	129
Science	5	18	78	96
	6	22	61	83
Biology	7	7	64	71
	8	12	79	91

Table 1 indicates that there are very limited topics related to real world problems in social studies textbook. Science and biology textbooks appear to incorporate relatively a larger number of topics related with actual problems. This is particularly true for grades 5 and 6 science textbooks. Variation in problem related topics in the subjects may be explained to a certain extent by the nature of the subjects. Social studies textbooks appear

to be devoid of problems, despite the alarming socio economic problems that could be treated in these subjects (Goodlad, 1985). The numbers indicate existing contents that lend themselves to problem situated learning. Their adequacy to promote problem situated learning is assessed in the discussion part. Another important criterion is the inclusion of questions that involve students in the process of learning and identification of learning purposes.

Table 2: Topics of Textbooks that Ask Questions at the Beginning and Set Purposes for Students

Subjects	Grades	Topics with questions and purposes	Topics without questions
Social Studies	5	0	83
	6	0	104
	7	0	117
	8	0	129
Science	5	30	53
	6	25	57
Biology	7	34	37
	8	33	58

All topics of grades 5-8 textbooks of social studies do not include questions at the beginning and do not set purposes which students have to follow. The textbooks simply present a description or explanation of contents. Science and biology textbooks are in a better position in this regard. But the questions in many cases are followed by answers.

Table 3: Ways Topics Are Presented to Students to Find out Information

Subjects	Grades	Description and explanation	Discussing/ Cooperative work	Making Experiments	Reporting from interviews
Social Studies	5	100%	-	-	-
	6	100%	-	-	-
	7	100%	-	-	-
	8	100%	-	-	-
Science	5	100%	3	19	
	6	100%	13	29	3
Biology	7	100%	1	32	1
	8	100%	2	6	1

Table 3 portrays all topics students are expected to read in social studies textbooks. The books present all information deemed necessary. Students are left with the responsibility of reading texts. This is a linear way of presenting information. Students do not get the opportunity to take part in searching for knowledge, as the texts completely feed information through description and explanation. As expected, experimental activities were included in science and biology textbooks. Grade six science textbook seems well designed because it incorporates different means of finding out knowledge. The 100% in science and biology textbooks indicates that all contents have a component of description and explanation. Despite indications by writers that project work and field-experiences are useful for developing students thinking ability at early and middle ages (Britz, 1993), very limited number of such activities were included in science and biology textbooks and none in social studies textbooks. An instrument that is useful to involve students in finding out information is the use of graphic organizers. Evidence on the kind and amount of graphic organizers included in textbooks is presented below.

Table 4: Graphic Organizers Used for Reflection (by Students) and Summarizing of Written Material

Subjects	Grades	Complete Organizers	Semi complete Organizers	Incomplete Organizers	Total
Social Studies	5	11	-	-	11
	6	11	-	-	11
	7	7	-	-	7
	8	5	-	-	5
Science	5	2	2	3	7
	6	3	5	6	14
Biology	7	8	5	8	21
	8	4	5	3	12

Table 4 indicates that there are very few graphic organizers in social studies textbooks. All the graphic organizers have complete information in the form of tables. Graphic organizers in science and biology textbooks are larger in number. They also include semi-complete and incomplete information. As a whole, not only the number of graphic organizers is small but also the majority of graphic organizers are completed with information. This puts into question the very purpose of graphic organizers- allowing students to record their prior knowledge, take notes through reading and discussion, and summarize and conclude information by themselves (Tinzman, Jones and Pierce, 1992).

Table 5: Classification of Summary Questions/ Exercises into Process and Content Questions

Subjects	Grades	Process Questions	Content Questions	Total
Social Studies	5	23 (18%)	105 (82%)	128
	6	16 (8.8%)	166 (91.2%)	182
	7	8 (4.4%)	174 (95.6%)	182
	8	8 (3.6%)	225 (86.4%)	233
Science	5	11(12.6%)	76 (87.4%)	87
	6	33 (24.6%)	101(75.4%)	104
Biology	7	35 (34.4%)	60 (66.6%)	95
	8	19 (16.8%)	94 (83.2%)	113

Table 5 depicts that there are many questions in social studies textbooks. The majority of them are however content questions that demand simple recall of information. A fair share of process questions exists in science and biology textbooks. This is particularly true in grade six science and grade seven biology.

4.2. Teachers' Awareness, Perceived Competence and Practice in Developing Problem Solving Capacity

The majority (85.1%) of the teacher respondents have the necessary qualifications (12+2) to teach in the second cycle of primary school and 45 (95.7%) have training related to problem solving.

Table 6: Teachers' abilities to Use Problem Solving Method, Appropriateness of Textbooks, and Change in Teaching Practice

Items	Responses		
	Yes	No	Total
Are you competent to use problem-centered teaching method?	37 (78.7%)	10 (21.3%)	47
Have you changed your method of teaching with the introduction of new textbooks?	19 (40.4%)	28 (59.6%)	47
Are textbooks convenient to apply problem-centered teaching?	21 (44.7%)	26 (55.3%)	47
Do you teach contents related to local problems in a different form as compared to other contents?	20 (42.6%)	27 (57.4%)	47

Table 6 indicates that 37 (78.7 %) of teachers feel competent to use problem centered teaching method. However, 28 (59.6 %) of the teachers reported that they have not changed their teaching method with the introduction of new textbooks. A similar percentage (55.3%) of teachers agreed on the appropriateness of textbooks for using problem centered teaching method.

Teachers were asked in an open-ended question to describe what is expected of them in applying problem centered teaching. Disciplining students, solving students' family problems, providing moral education, advising students, carrying out research activities, listening to the radio and reading books, preparing lesson plans and administering follow-up tests were the replies obtained from many of the teachers. It seems that teachers are equating problem-centered teaching with students behavioral and learning problems and professional demands expected from them. Very few teachers reported student-centered teaching, relating education with local situation, group work, questioning and using teaching aids. In relation to change in teaching practice, teachers who reported a change in the their teaching method believe that there are changes in textbooks that are

appropriate for problem centered teaching while those who reported there is no basic charge in the textbook said that except the shifting of content from one grade to another the change in the textbook did not bring about any significant change in the contents.

Based on such preliminary information, an attempt was made to examine teachers' awareness of what is needed for problem solving methodology. The teachers were asked to rate the importance of various instructional elements on a four-point scale. The instructional elements mainly consisted of instructional activities and roles that are necessary for developing students' problem solving abilities. A few of the items were related to direct instruction (coded reversely in the analysis).

The study shows that teachers have adequate awareness about the instructional elements that are important for developing problem solving capacity of the students. The mean value (3.08) with standard deviation (0.25) is close to the category of 'important' (3). it is significantly different from the test value (expected mean value= 2.50), P=0.000. This finding, however, tells us about the overall perceived importance attached to the 12 instructional elements teachers were expected to rate. Hence it does not clearly show the perceived importance teachers attached to each instructional element. To identify which instructional elements are valued by teachers, t- test was run for each item.

The results indicate that teachers rated mean values on, for example, in-depth examination of topics, allowing students to search for solutions by themselves, teachers role in determining content and method and creating conducive situation for learning etc., are significantly different from the expected mean value. That means while teachers view on some of the elements is tuned with the theoretical and research grounds for developing problem solving capacities, it still contradicts theoretical and research grounds in certain instances. The importance they attached to examination of topics, allowing students to search for solution by themselves, emphasis on reasoning process and the creation of suitable situation for learning is in line with the expected awareness for developing problem solving capacity.

However, their highly rated mean values on, for example, transmission of readymade knowledge, teachers' decision in selecting content and method etc., digress from theoretical and research basis for developing problem solving capacity. Teachers, if they had adequate awareness, were expected to rate these elements as 'less important' or 'unimportant'. Nevertheless, the point that the rated mean values on these instructional elements were significantly greater than the expected mean value demonstrates that the majority of teachers rated the elements as 'very important' and 'important'. Moreover, teachers' rated mean value on asking open ended questions (2.72) was not statistically different from the expected mean value. This shows that the rating of the item as 'less important' or 'not important' was made by a reasonably large number of the teachers. The significantly lower rating of the role of emphasizing transmission at the expense of process was not also attained. Teachers' rating of the belief "students can learn without the involvement of teachers was" also found to be lower than the expected mean value, though this was not statistically significant.

As a whole, while teachers 'perceived importance' ratings concord with research basis on some of the instructional elements, they, however, underrated useful aspects of problem solving instruction and overrated instructional elements that deter the development of problem solving ability in certain circumstances. This tends to suggest the teachers' lack of a well-developed awareness.

Another purpose of this study was to examine teachers' perceived competence to employ instructional elements that are related with problem solving methodology. To this end, eight items that describe role and behavioral patterns required in problem solving methodology were rated by teachers in a four-point scale.

The rated mean value (3.86, with standard deviation of 0.15) was found to be close to the category of 'I feel very competent and can do it easily' (4) and was significantly different from the test value (expected mean value= 2.5), P=0.000. Hence, teachers believe that they have the competence to apply components of problem solving methodology at ease. However, it should be made clear that the measurement of teaching competence through questionnaire could result in data which merely shows teachers' perception rather than competence that is demonstrable and practical (Fullan and Pomfret, 1977). Classroom observation was used to see whether this reported competence transpires in actual teaching through observation. Table 7 below shows the results obtained in this connection.

Table 7: Frequency of Practiced Elements of Problem Solving Instruction (Maximum expected frequency is 20 and minimum is 0 for each item)

Instructional elements	Social studies teachers				Science and biology teachers			
	2	1	0	Total	2	1	0	Total
Does the teacher ask open-ended questions?		4	6	4	3	2	5	8
Does the teacher make students formulate and forward their own ideas?	1	2	7	4	2	2	6	6
Does the teacher ask students to justify or explain their answers?		3	7	3	3	3	4	9
Do the students assume the role of questioner and critic?		3	7	3	1	2	7	4
Does the teacher invite students to take part in discussion?	1	2	7	4	3	2	5	8
Does the teacher allow students to conclude concepts based on their own experiences?	1	2	7	4	2	1	7	5
Does the teacher present content by relating it with real life situation so that students can learn by themselves?		1	9	1	1	2	7	4
Does the teacher deal with limited topics by thoroughly examining them?	4	6		14	6	4		16
Does the teacher emphasize the process of learning by allowing students to think rather than asking them to memorize facts?	1	1	8	3	2	3	5	7
Do teacher questions demand students to think rather than recall information?		3	7	3	3	2	5	8
Total				**43**				**75**

Table 7 indicates that many aspects of problem solving instruction are totally excluded from the teaching learning process. The numbers at the top of the Table (i.e., 2, 1, and 0) indicate the frequency in which the teachers demonstrated evidence of problem solving instruction during the two classroom observation. Number 2 shows the observed teachers demonstrated elements of problem solving instruction more than once; number 1 shows the teachers showed the behavior only once and 0 shows the absence of any evidence of problem solving instruction during the two classroom observation. Very limited number of teachers demonstrated behavioral patterns and roles related to problem solving instruction. On top of these observation items, teachers were assessed on whether they employed the steps suggested by Polya (1957). None of the teachers employed the steps in a sequential manner.

There are ten items in the observatory check list. Twenty teachers (ten teaching science and others teaching social studies) were observed two times. Altogether a total of 400 counts, 200 for each, are expected. The frequency counts show that they are much lower than 200 though there are frequency differences between the two groups of teachers. To see whether there are differences in the use of instructional elements, chi-square test was employed. Table 8 below demonstrates the data obtained in this regard.

Table 8: Association between Application of Problem Solving Instructional Elements and Type of Subjects (Science or Social Studies) Taught

Groups	**Did they apply instructional elements?**		**Total**
Science Teachers	Yes	No	
	75 (59)	125 (141)	200
Social Science Teachers	43 (59)	157 (141)	200
Total	118	282	400

$\chi^2 = 12.29,\ P < 0.01$

Table 8 shows that teachers are more likely to employ elements of problem solving instruction to teach science subjects than to teach social studies subjects. As has been pointed out in the methodology part, it is difficult to exclusively classify the teachers as science teacher and social studies teachers. Some teachers taught subjects from both streams in primary schools. The analysis in this study is, therefore, based on what the teachers were teaching during the time of observation.

Discussion

This study was intended to examine a continuum from a policy to curricula materials and teachers' awareness and practice. With the understanding that aims give orientation and direction to program development and teachers role, an assessment was made to see how textbooks organization and teachers' awareness and practice fit to help students develop problem solving capacity.

Curricular materials for developing problem solving capacity have to be prepared with the prime purpose of giving opportunity to inquire and discover knowledge and meaning through active involvement of students (Jones, Palincsar, Ogle, & Carr, 1987). There is little or no space for feeding ready-made knowledge through reading and instruction. If knowledge is presented in finished and completed way, there will be no room for students' involvement in thinking. That is what scholars (McNeil, 1996; Costa, 1992) underline when they state the *process of learning is the content of thinking*, especially problem solving capacity, not the fact, idea, concept or principle under treatment. An unavoidable element, therefore, in textbooks preparation is the very existence of information or knowledge gap. Textbooks miss relevant knowledge to inspire students' knowledge seeking behavior.

Results of this study, however, revealed that grades 5 to 8 social studies textbooks grades 5 and 6 science, textbooks and grades 7 and 8 biology, textbooks, are not well-equipped with essential elements for developing problem solving capacity. The most essential precondition textbooks have to

satisfy to promote problem solving learning is provision for problem situated learning (Tinzman, Jones, and Pierce, 1992). Textbooks have to provide contents as problems to be tackled by students. It is giving an opportunity for students to come up with own solutions to topics which are related to real life and their experiences. In our situation Deforestation, Air Pollution, Garbage, Erosion, Population Increment, Malaria, HIV-AIDS are topics that could lead themselves to problem situated learning. Hence textbooks are expected to allow students to describe and explain these topics and seek the causes and measures to be taken by serving as a catalyst between contents and students rather than describing and explaining by themselves. If description and explanation is given in the textbooks, students will not get the opportunity to be involved in learning. Lack of involvement in learning eventually makes students lose their interest in and motivation for learning.

Social studies textbooks have few contents related to students' experiences. Even the few contents that are available are not stated as problems but they are described and explained. For instance, in grade six social studies textbook, "Protection of Soil Erosion'' page 40; " Solutions for Climatic Change" page 40, and "Traditional Beliefs" page 83 are appropriate for problem situated learning. In grade eight social studies textbook, "Air Pollution and Prevention" pages 35-37; "Population Explosion" pages 60-63; and "Democratic Rights" page 80 should have been left to students to a certain extent.

In science and biology textbooks, there are reasonable amounts of contents that can be presented as problems to students. Many of these contents are however presented in description and explanation though they are frequently followed by questions. In grade 5 science textbook, "Common Cold" page 12; " House Flies" pages 34-35; and in grade six science textbook, " Air Born Disease" page 22; "Water Born Diseases" page 23, "Pollution" page 4, "Sexually Transmitted Diseases" page 113. In shouldn't have been described and explained in depth. In Grade seven biology textbook, "Malaria" page 80-90, "HIV-AIDS" page 157; and in grade eight biology textbook, "Prevention of Sexually Transmitted Diseases" page 63; "Avoiding

Garbage" page 67; "Causes of Soil Erosion" page 113; and "Water Pollution" page 123 could have been used for problem situated learning.

What is found to be better in science and biology textbooks, particularly grade 6 science and grade 7 biology, was stating of contents in question form in order to involve students in the search for knowledge. Yet, this was not useful enough as we will see later. Hence, the first criterion in the organization of textbooks for developing problem solving capacity-problem situated learning-suffers heavily. This happens to be so because textbooks neither have adequate contents as problems nor do they present the existing problem related contents in the appropriate way.

Once students are given problems to be solved, the inclusion of questions at the beginning of topics and setting purposes could be a successful step for brainstorming and allowing students to predict. Not even a single topic of grades 5 to 8 social studies textbooks sets questions. Topics are hastily described and explained. This is true even for topics related to the local situation. Topics such as 'Climatic Change' page 38; 'Desertification' same page; 'Erosion' page 40; and 'Traditional Beliefs' page 83 of grade six social studies textbooks are presented in a similar descriptive and explanatory fashion. The same is true for 'Air Pollution' page 35; 'Population Explosion' page 60; and 'Effects and Causes of Air Pollution' grade 8 social studies. Students in all cases are left with a simple but un-motivating task of reading texts.

Grades 5 and 6 science textbooks and grades 7 and 8 biology textbooks are relatively better in incorporating questions and setting purposes at the beginning of topics. Yet, many questions are either followed by answers or they demand only students' agreement or disagreement. For instance, in grade 8 biology textbook (page 46) under 'Plant and Human Diseases' a question "what is disease?" is presented. An answer is provided next to the question in the textbooks. In grade 7 biology textbook (page 16) under the topic 'Bacteria'; the book asks "what are bacteria?" It then answers what bacteria are. The same book (see p. 89) answers "shivering, headache, loss of appetite…" following the question "what are symptoms of malaria?" The inclusion of questions in science and biology textbooks is one

encouraging aspect observed. Providing answers to the questions is however the discouraging aspect observed. This denies students the opportunity to get involved in constructing knowledge.

The active engagement of students in learning heavily rests on how properly the preceding stage is designed and the extent of the provision for omission to be filled by students' inquiry. Based on the virtue that questions are completely excluded at the beginning of topics and contents are hastly explained and described in grades 5 to 8 social studies textbooks, reading information in the textbooks appears the only means of gaining knowledge. Thinking requires the presence of omissions and problems to be completed by integrating new knowledge with prior knowledge (Beck and Dole, 1992). Otherwise, many students will lack curiosity to involve in thinking and learning from the onset as they believe textbooks have given the needed knowledge (Collins, 1992). Casey and Brown (1993) also noted that completed information and accumulation of facts in texts overload students' memory. This results in the decline of students' success in reasoning.

Science and Biology textbooks are better in promoting self learning and provision of omissions. Questions are included at the beginning of topics but there are answers following the questions. To a limited extent, experimental activities are incorporated; but results are provided next to the activities. Topics for group discussion and presentation are available in some areas. Interviewing resource people on some topics is also suggested as a means of finding out knowledge.

Graphic organizers are also indispensable virtue of textbooks for developing problem solving capacity. The process of learning is the content for problem solving curriculum. This means that students should get opportunity to construct their own graphic organizers and fill their predictions and conclusions in set graphic organizers. Giving students' information gap activities through graphic organizers gives students the opportunity to be involved in the construction of learning (Thelen, 1983). Presenting graphic

organizers in completed and finished way is not better than giving textual information to be read.

Very few graphic organizers are stipulated in social studies textbooks of grades 5 to 8. The textboos also display complete information. Research indicates that students can be motivated when they are presented with semi complete or incomplete graphic organizers. Asking students to construct their own graphic organizers can also motivate the students. The graphic organizers stipulated in grades 5-8 social studies textbooks are not just few but they also display complete information. The organization of science and biology textbooks is better in terms of the inclusion of questions and in the number and kind of graphic organizers in the textbooks is also not negligible.

Finally, the majorities of questions are content or closed-ended type. For problem solving open ended questions are more appropriate, as they involve students in reasoning process. They also suggest more than one solution. The fact that the majority of questions are factual (content type) worsens the incompatibility of the textbooks fitness with the aim of the education policy. One aim of education policy is to develop the students' problem solving capacity. Stressing this point, Newmann (1992, p. 114) notes:

> Higher order thinking [problem solving] occurs only when students are faced with questions or tasks that demand analysis, interpretation, or manipulation of information; that is non-routine mental work. In short, students must be faced with the challenge of how to use prior knowledge to gain new knowledge, rather than the task of merely retrieving prior knowledge.

The competence and practice of teachers is another important point in the context of policy to textbook continuum. Knowledge and understanding of intentions and curricula materials and behavioral practice of teachers are determining factors in implementation. As discussed earlier, textbook organization deviates much from what is desired. The remaining thing for the realization of the policy aim is the extent to which teachers harmonize the

missing linkage between the textbooks and the policy. Do teachers' competence and practice live up to the intent of the policy?

Teachers' response to this question affirmative; but neither their awareness nor practice appears to confirm this. The majority of teachers claimed to have the competence to apply problem-centered teaching but their teaching activities were observed to hamper the development of problem solving capacity. The teachers attached strong value to their role of transmissions during teaching. The discussion and inquiry methods of teaching were rarely used during lessons. They also tended to believe that social problems have only one solution. These processes of evidence challenge the claim the teachers made to have the competence needed to create a link between the policy document and the textbook.

In addition, the teachers' rating on simple coverage of topics was not statistically less than the expected mean value. This indicates that large number of teachers attached the value of' importance to covering topics.

Classrooms were devoid of major elements of problem-centered teaching. Contrary to expectations, teachers mainly asked closed-ended and factual questions; students mainly assume the role of listening and writing notes. Polya's (1957) steps of problem solving were not observed in a continuous and coherent way in any situation.

One interesting result unveiled in the study is that biology and science teachers were more likely to demonstrate components of problem solving instruction than teachers of the social studies. This could be because of the textbooks' organizational differences reported earlier.

One perplexing outcome of this study is the paradox between what teachers claimed to have done and what they actually did in classroom. Basically teachers are expected to practice instructional elements of problem-centered teaching. They reported that they had the competence to do this. However, the blurred awareness teachers demonstrated could explain the absence of

classroom behaviors related to problem-centered teaching. Yet, the question "why do teachers who claim to be competent enough to carry out problem-centered instructional elements happen to remain unaware of the elements that are essential to develop problem solving capacity?" is worth considering.

A number of intricate factors, some beyond the scope of this study, might help to answer this question. Firstly, it seems clear that the training the majority of teachers claimed to have taken is not adequate enough to link the aim of the policy with teachers' awareness and practice. Though teachers attached a correct value of importance to some elements of problem-centered instruction in their response to one item relevant to this, in the questionnaire, their awareness problem is clear enough to be noticed from their responses to open-ended questions. Only very few teachers managed to count on learner-centered teaching, only few of them also showed concern for local resources. Many tended to write disciplining students, financial problem, commitment to teaching, etc., when they were asked to list the requirements of problem solving education. However, the points the respondents listed are problems faced rather than the requirements of problem solving education. It is clear that the majority of the teachers were not actually practicing elements of problem-centered instruction to the level they claimed to be competent. Teachers may still hold the traditional belief that teaching is writing on the blackboard and giving explanation. This belief could be supported by the strong value of importance teachers attached to the transmission role of teachers. In educational reform, the introduction of new teaching styles is usually antagonized by teachers (Fullan and Pomfret, 1977) and is also a challenge for teachers to change their customary practice (McNeil, 1996). The belief of teachers, on the other hand, is one of the five dimensions of curriculum implementation (Fullan and Pomfret, 1977). This suggests the need for an extensive effort to be made to change teachers' belief, besides changing their competence.

Textbooks organizational loopholes could also contribute to retarding what would have been gained out of the existing awareness and competence of teachers. The mix of these and other unexplored factors might explain why classroom practices are loosely related with the original intention—developing problem solving capacity.

As cited in McClure, Chinksy and Larcen (1976), the problem solving curriculum and instruction assume six components: problem solving orientations, problem identifications, alternative solution, consideration of consequences, elaboration, and integration. Problem solving orientation is related to awareness and beliefs for developing problem solving capacity. Accepting that problems are part of life; students can solve many of their problems by themselves; and setting a frame of stop and think moment before forwarding a solution to problems are examples of such orientations.

In view of this, problem solving orientations can be related with teachers' awareness and appropriateness of textbooks in demanding thinking before forwarding a solution. As indicated earlier, teachers expressed their doubt about students' ability to learn by themselves. They firmly believe in the existence of teachers for the learning of students. Books as well are ill equipped with moments of 'stop' and 'think'. For example, contents are described and explained; questions set at the beginning are answered instantly.

Social studies textbooks do not have adequate problems related to students. They also do not have sufficient questions and purposes that focus students. Biology and science textbooks are better in including real life contents, but they are poorly organized to suit problem solving education.

An alternative solution is to demand students to generate many possible solutions to a certain problem. In a situation where there are very limited problems, where the majority of questions are factual rather than process type and where teachers rely on closed-ended type of questions, it is unlikely for students to generate alternative solutions for a problem. The

consideration of consequences, elaboration, and integration entails the process of passing through steps of prediction, finding out, application and summarizing. The status of these steps in the textbooks and teaching learning process leaves much to be desired to promote considerations of consequence, elaboration, and integration.

Conclusion and Implications

Social studies, science, and biology textbooks were found to deviate a lot from organizational styles meant for developing problem solving capacity. Textbooks are alien to predictions except in some cases in science textbooks; even the available ones are provided in a manner that disconnects them from other components. Contents are presented in a completed manner. There are no omissions for student involvement in thinking although involvement is an essential element of problem solving curriculum (Tinzman, Jones, and Pierce, 1992). Graphic organizers are meager; questions are many, but they are dominantly recall type of questions. The written texts follow linear description and explanation. 'Stop' and 'think' moments are sparingly available in the textbooks.

The existing focusing questions, experimentation, cooperative work, graphic organizers and summary questions are not set in a coherent and continuum manner. Yet, sustained concentration, coherence and continuity in learning material are decisive elements of problem solving curriculum (Newmann, 1992). The same holds true in the practice of teachers. The steps of problem solving instruction were not observed in interrelated and sequential manner in any of the classrooms observed for the purpose of his study; only pieces were observed in certain situations.

To summarized, curriculum reform necessitates corresponding changes in people, program, and organization (Fullan, 1991). Extensive efforts have been made by the Ministry of Education to change old textbooks and train teachers; yet these efforts are not paying back much; teachers are not well aware of what is expected of them and textbooks are poorly aligned with organizational procedures for problem solving purpose. A problem exists in

translating the aim of the policy into curricular materials and teachers' practice. Hence, to bridge the gap among the policy, curriculum materials, and teachers practice, the following suggestions are forwarded.

1. Textbooks need organizational amendment in terms of curricula elements that develop problem solving capacity.
    a) Questions for brain storming, focusing students on certain learning materials, and making predictions have to be included at the beginning of topics.
    b) Textbooks should purposively leave knowledge in its unfinished form in areas where students can learn by themselves. There should be omissions or incomplete knowledge to be searched out by students. Care should also be taken not to overload books with factual information.
    c) Alternative and learner-centered ways of searching for knowledge has to be included. Thinking doesn't progress in a linear fashion through reading only. Discussion, interviewing, analyzing a problem, and experimentation should be included as ways to construct knowledge.
    d) Semi-complete or in-complete type of diagrams, charts and graphs should be included to help students predict, summarize, and integrate ideas..
    e) Factual questions should be minimized and process questions have to be incorporated.
    f) Virtually all activities that are currently found in social studies and the majority in science textbooks are supposed to be carried out on individual basis. Tasks that demand collaborative decision making and action should be included in these textbooks.
    g) The incorporation of elements needed to develop problem solving capacity should be in a consecutive manner rather than putting one element in one topic and the other element in another topic. Continuity and coherence of these elements is essential to develop problem solving skills of students.

2. Despite the various trainings offered to teachers on problem solving, neither their awareness nor practice demonstrates this. Thus,
    a) In-service or in- service training on the technical aspects of problem-centered instruction should be provided to teachers by educational experts.
    b) In upgrading certificate teachers to a diploma level, training institutions and the Ministry of Education should not underestimate the load for professional knowledge and skill. These teachers need intensive training to drop their traditionally held beliefs and practices. The training should duly be related with problem solving teaching method as applied to their specific subjects.
3. Teachers have to be made aware that they have to work on textbooks rather than writing notes on the black board and explaining them in all cases.
4. There is some evidence that the structural alteration from 6-2-4 to 8-2-2 tends to overburden the curricula with large amount of content. The contents and objectives of the previous curricula have gone from upper grade level to lower grade level. It is important to examine how textbook writers accommodated the earlier 12 grade levels curricula into the current 10 grade levels curricula. Injecting contents simply into the various level of the curriculum might ultimately stifle the development of students' problem solving capacity.
5. This study was a general survey which pointed out visible and major aspects of textbooks organization to develop problem solving ability. There is a rich and challenging area of research waiting ahead. It is worthwhile to go deeper into specific features of textbooks and examine their relevance for developing problem solving capacity. The way written texts are presented to students, content organization and the amount of information incorporated in the textbooks deserves to be studied in each subject and grade level in a more detailed way.

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