The Challenge of Indonesian Mathematics Teachers To Face the New Curriculum

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This year, the Ministry of National Education (Indonesia) will declare a new curriculum that is called "The Competency Based Curriculum" or "the 2004 Curriculum". This curriculum is different in some aspects from the 1994 Curriculum. Competencies are basic knowledge, skills and values, which are consistently and continually reflected in usual thinking and acting. The differences between the two curriculums are:

Aspect	The 1994 curriculum	The 2004 Curriculum
Knowledge orientation	As a product	As a process
Teaching orientation	Tend to teacher centred Always uses mechanistic, structuralistic method. Emphasize to learn content	Student centred Emphasize to contextualize/ realistic approach. Emphasize to Learn how to learn, learn to do, learn to be, learn to live together
The teacher's role	As the main resources	As facilitator, motivator, guide.
Assessment	Emphasizes the cognitive aspect. Use a paper - pencil test.	Cognitive, psychomotor, and affective aspects. Authentic/alternative assessment: portfolio, performance, project, or journal.
The curriculum target	Finished all subject matter (content curriculum)	Students have all competencies as the learning outcomes that can be used to learn competencies subsequently.
View of student's ability in classroom	Consider students with same ability	Consider student with different ability.

The similarities of two curricula are that they considered the prior knowledge and the lesson order. In general, the lesson materials are similar, although there is a decreased content. The Mathematics Competencies Standards focus on the connection among concepts and application on solving problems, communication of ideas, the use of reasoning, problem solving, and encouraging the attitude to appreciate mathematics in everyday life. The 2004 Curriculum has been implemented as a pilot project at some schools and familiarised to almost all teachers. Because this curriculum proposes a new paradigm in some aspects, it raises some new problems for the teacher. The culture, attitude, and belief of teachers in the teaching and learning process must change. If they usually explain a concept themselves almost without regarding the students, this time, they must engage, motivate, or facilitate their students to grasp a concept. In addition, teachers were used to giving the final solution to the student's problem, right now they should be patient to wait for and give some clues to student, such that they can reconstruct a concept or carry out problem solving activities.

Based on my experience, when I was involved in training as a trainer and in socialization of new curriculum, or conducting an observation in some school, I could classify some problems which are proposed to me, namely:

1. How to design a learning process, such that the students can be guided to reconstruct or reinvent a concept.
2. How to implement the authentic or alternative assessment in the teaching and learning process.
3. How to manage and share attention to students of various abilities.
4. How to arrange a teaching process, because teachers suspect that applying the new curriculum is a wasting of time.
5. How to manage the students in which the majority of them have difficulties in prior knowledge.
6. To implement the new curriculum needs special and expensive devices or equipment, e.g. computers, manipulative or educational tools.

In solving the first problem, as a team member of the developer of the Contextual Teaching and Learning (CTL) in the State University of Surabaya, I gave many samples of how to design the learning process through a direct demonstration and CD's. I always say: it is a new perspective for us, so we have to try to implement it step by step, so that sooner or later we will find a pattern. We may not think that if we apply such a way, all problems would be immediately eliminated. I challenge the teachers to be creative and confident to improve the quality of teaching and learning based on their own classroom experiences. We refer to CTL approach, Realistic Mathematics education (RME) and some models in Slavin and Arend books. For example, problem based instruction (PBI), cooperative learning, direct instruction, learning strategies and combination among them (multimode).

To implement authentic or alternative assessment in classroom is the crucial problem. The teachers commonly use paper-pencil tests and they believe that the model is effective and efficient. When they face the new perspective in assessment, they doubt what the importance is. The rational explanation is not enough, if we just describe that in educational perspective; we should assess in holistic aspect (cognitive, psychomotor, and affective) or show the benefits for students or based on the positive result of research. We must touch their emotions to generate internal motivation and their belief. As an example, giving understandings that assess student is same as determining or justifying their future and it must be responsibility to God. Furthermore, as a teacher, we should assess children in ways that provide the opportunity to demonstrate actual performance of the content of learning according the real-world condition and curriculum.

When teachers use alternative assessment, they must create scoring rubrics, checklist, written comments or descriptive reports to evaluate student's work. Their customs change from examining the product to the process. Sometimes, they aren't confident to make decision about evaluation procedure or their developing of scoring rubric. They also complain about complexity of rubric items and think that it cannot apply in their classroom or it is difficult to assess about 45-55 students. Even, if we use some techniques together. I appreciate their questions (problems), because this time is the transitional period of implementations the new curriculum with different perspective. I suggest applying not all technique. We should try one by one to make a pattern. First, we choose simple items for scoring rubric that it can be measured in practical mathematics classroom. Then, try out in classroom. From that activity, we can learn to manage or design assessment which it is suitable with the classroom condition. I always give an example and guide them to developing themselves, also learn assessment theory to direct them to overcome misunderstanding. For example, we can assess student's task by performance assessment indirectly in one session for all students. If we want to assess the problem solving skill, we can divide in some session for some students. Performance assessment and portfolio aren't separate from each other; we can insert performance assessment in portfolio. Applying portfolio doesn't mean examine a stack of students work. Students choose 2-4 pieces of the best works and explain why they have included each in the selection. The selected items must show a student's intellectual growth in mathematics over time. In despite, I also motivated and encourage them to try to be creative.

Actually, the 1994 Curriculum has promoted the mastery learning principle but it

doesn't work optimally. Teacher always view student with same ability and same learning speed. The students with poor or brilliant ability are treat equality. These conditions impact them. Their motivation decrease and the learning situation is unpleasant. Although, to manage classroom with keeping attention to different ability of students is more difficult, it is humanistic and we can take benefit to teaching and learning process hereinafter. I suggest making use of upper students sharing with lower students. The upper students guide and help the lower students. It works in some schools. I also want to try alternative model, such as cooperative model with think-pair-share (TPS) type or others.

The most teachers –I see in training or upgrading- always complain about the difficulties to manage classroom activity, because the majority of their students are weak in prior knowledge. If they use alternative model of teaching and learning, it needs long time and it is not effective for big class. I give a conflict question to encourage this challenge. I ask them, "what is there guarantee if now we can overcome difficulties; hereinafter we do not face the same problem again?" The audience usually do not answer directly, they think and discuss with friend side. I pose a question again, "what are students in our classroom in this time equal with students in next year? Didn't they bring other difficulties?" Teacher can be guided to make reflection that some difficulties is risk of their job. The difficulties are challenge to force them to be creative in improving quality in classroom process. I encourage them to learn and learn continually and communicate to other teachers. To overcome these problems, I ask them to reflect about their classroom condition, may be that's happen because we, ourselves, cannot manage classroom seriously. We need to try out applying innovation learning process. Today take time, but learn from what is going on yesterday, we have to arrange the parts of activity that require long time. For example, we ask students to make one sentence to describe the learning and teaching process in reflection activity, give student some material which they do not need to cut again, or to form groups before the learning process hold in classroom. The important thing is examine or evaluate the teaching and learning process to make reflection for improving that quality, also try and try creatively and enthusiastically. Another way is making communication and sharing with other teacher who have same problem, about how to solve it.

The teacher supposes that the principle of the teaching and learning process in the new curriculum need special devices, such as manipulative, computer, or educational materials. This is not the truth. Concrete material around their environment or classroom can be used as educational tools. I show it at one contextual CD's. Even so, the teaching and learning process is not only in the classroom, but it can hold out classroom as outdoor activity. I suggest if the school have full facility as computers, internet, TV or video/CD's player, it will be good to use and try in learning process. If it is not full facility, don't surrender without trying to improve learning process.

Actually, all problems are identified at transition period, can be solved if we behave positive thinking. The limitation of facility cannot be reason to stop progress. I always encourage teacher to face the challenge for student's future and be patient that the direct effect doesn't see at the moment. The teachers will construct or establish an effective model of teaching and learning, if they continuously reflect or look back their experience.

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