Pedagogical Issues in Integrating Thinking Skills in the Classroom

Abdullah Mohd Noor

ABSTRACT: *The importance of thinking skills in education and in the world of work cannot be denied nowadays. The present issues concerning students not be able to think systematically, less capabilities in active learning, less independent, learning through memorization are issues in this century. Some teachers and parents are worried concerning the situation. What are the views of trainee teachers concerning this matter? What are the hindrances faced by teachers in integrating thinking skills in their classrooms? Is teacher centered methodology to be blamed in not integrating thinking skills in their classroom? What are the relevant teaching strategies that can help in integrating culture of thinking in the classroom? For this study, the methodology in collecting data can be categorized into three phases: exposing trainee teachers with thinking culture in the classroom, using questionnaire to elicit necessary information such as data on trainees' reactions concerning the research questions, and lastly conducted interviews to consolidate information and data collected through the questionnaire. Results of the study showed that difficulties in integrating thinking skills in the classrooms, thinking skills do not limit to student-centered strategies but also on teacher-centered strategies, and lastly cooperation with many sectors in schools in integrating thinking skills successfully.*
KEY WORDS: *thinking skills, active learning, teaching strategies, and integrating thinking skills successfully.*

INTRODUCTION

Teaching and learning process involves teachers, students and the curriculum. Generally, the teaching approaches in the classroom around the world are teacher-centered and student-centered approaches. Teacher-centered approach is often termed as traditional deductive approach; and student-centered approach is called a process-oriented approach. The most popularly or commonly practiced method or approach of teaching in Southeast Asia is the teacher-centered approach or traditional deductive approach. Student-centered approach or process-oriented approach is

Dr. Abdullah Mohd Noor is a Senior Lecturer at the Sultan Hassanal Bolkiah Institute of Education UBD (University of Brunei Darussalam), Jalan Tungku Link, Gadong BE 1410, Bandar Seri Begawan, Brunei Darussalam. He can be contacted at: abdullahmohdnoor@yahoo.com

seldom practiced particularly in the teaching of English as a Second Language (Bourke, 2004).

Student-centeredness needs creative teaching, creative learning and a student-centered curriculum. Concerning thinking skills, there is no consensus as to what should be included in the category of thinking skills. Most writers assume that the term includes "higher-level" activities such as problem solving, decision making, critical thinking, logical reasoning and creative thinking (Nickerson, 1988; Rajendram, 2000; and Wilson, 2000). There are two types of thinking skills i.e. creative and critical thinking skills (Abdul Shukor, 2001). While K. Cotton, however, suggests another name for the thinking skills that is higher order thinking skills (Cotton, 2003).

The Needs for a Thinking Culture

There are several reasons as to why there is a need to create a thinking culture in the society. Among others are to cope with the fast changing world where new knowledge is being produced daily, while old knowledge is being reorganized and redefined. In time of rapid change, the first priority of an education system is to teach the children how to learn and how to think (Abdul Shukor, 2001). Some of the characteristics of this millennium are: (1) Life, society and economics are becoming more complex; (2) Jobs are disappearing at an unprecedented rate; and (3) Knowledge and information has upstaged land, labor and capital as the most important input in modern productive system (Abdul Razaq Ahmad ed., 2005).

Some thoughtful reasons for the needs of "higher order thinking skills" are: (1) Knowledge based upon rote learning has been discredited, individuals cannot store sufficient knowledge in their memories for future use; (2) Information is expanding at such a rate that individuals require transferable skills to allow them to address different problems in different contexts at different times throughout their lives; (3) The complexity of modern jobs requires thinking staffs who demonstrate comprehension and judgment on world of work; and (4) Modern society requires individuals to assimilate information from multiple sources and make judgments (Wilson, 2000).

In other words, workers entering the workplace of the future must come fully equipped with the skills that enable them to be system thinkers and continuous learners (Abdul Shukor, 2001:3). The other reason for the needs of a thinking culture is the corporate world who expressed their concern on the interest in teaching thinking skills because they detected the inability of university graduates to make decisions independently (Phillips, 2001:164). Since the wealth of a nation lies in its people, then it is wise and logical that the brain (thinking) should be the focus of any educational development (Abdul Shukor, 2001:3).

According to S. Tishman *et al.*, a thinking culture is about how to transform the culture of a particular classroom into a culture of thinking with the purpose of teaching thinking to prepare students for a future of effective problem-solving, thoughtful decision making and lifelong learning. The thinking classroom is referred

to learning and teaching in the environment of a culture of thinking. In the classroom environment, there are forces that work together such as language, values, expectations and habits, to express and reinforce the enterprise of good thinking (Tishman *et al.*, 1995:2).

Culture of thinking includes the language of thinking, thinking dispositions, mental management, strategic spirit, higher order knowledge and teaching for transfer. These are the six dimensions of good thinking. Interestingly, in the last decade or so, many countries have been attempting to reengineer their education systems in an effort to produce thinking students for the future. For example in 1990's, Singapore embarked on "Thinking Schools, Learning Nation"; Malaysia on "Smart Schools" and Brunei Darussalam on "Thoughtful Schools" (Abdul Shukor, 2001; Chang, 2001; and Sim, 2001).

The Importance of Thinking Skills in Education

There is a lack of higher-order thinking ability among students and there is a need to prepare students for future effective problem-solver, thoughtful decision-maker and lifelong learning. There is a necessity for students to be independent thinkers as an increasingly wide range of jobs in future requires capable workers/employees who have the ability to think. Further more, thinking skills are not yet widespread among students as to function successfully in a highly technical society. A report on Malaysian's experience mentioned that teaching higher-order cognition help students to become independent learners and developing their ability to think are more and more becoming commonly stated educational aims. N. Rajendran found that there is the lack of ability among students to apply knowledge transmitted through schools and classrooms to real world problems. He stresses that:

> […] many students are unable to give evidence of a more than superficial understanding of concepts and relationships that are fundamental to the subjects they have studied, or an ability to apply the content knowledge they have acquired to real world problems (Rajendran, 2000:123).

As a result of this, there is a need to teach thinking skills as an integral part of the school curriculum. Most countries are concerned with raising educational standards through the compulsory schooling. According to K. Cotton, in a highly technical society, teaching children to become effective thinkers is a recognized goal of education. This is to equip the children with lifelong learning and thinking skills necessary to acquire facts and process information in an ever-changing world. As one of the functions of schooling is to supply thoughtful labors to society, it is important that thinking should be integrated in the school curriculum (Cotton, 2003). Other than the concern on mastery of the basics such as reading, writing, science and mathematics etc., equal concern is also on thinking abilities. Basic knowledge alone or mastery of it alone is not sufficient to meet the demands of the labor market in the future.

Some related literatures on pedagogy that contributed to develop thinking skills are seen in the works of K.H. See (1998), Lee Su Yin (1999), M. Skolnik (1999), C.P. Chelliah (2001), A. Taylor (2001), Tchoshasnov (2001), K.S. Tan (2002), H.S. Dhindsa and V. Shanmuganathan (2002), K.H. See and S.B. Lim (2003), C.S. Yong (2003), C.S. Chai and S.C. Tan (2003), and J.M. Bourke (2004). In teaching science subjects, the works of K.H. See (1998), H.S. Dhindsa and V. Shanmuganathan (2002), and C.S. Yong (2003) are worth mentioning. Computer-assisted learning and child centered learning can help students in problem solving, creativity, innovation and progressivism in mathematics (See, 1998). Accordingly, K.H. See and S.B. Lim (2003) also suggest the use of analogy in teaching mathematics and science.

While M. Skolnik (1999), in "Creative Problem Solving", once mentioned that there are four analogies in creative thinking. These are personal, direct, symbolic and fantasy analogies. In teaching science and mathematics, direct analogy may be used. In teaching chemistry, "*the rich cultural backgrounds of teachers and their students can be used to develop new culture sensitive pedagogies*"; and teachers have to "*cope with students from different cultures to produce optimum learning*" (Dhindsa & Shanmuganathan, 2002:15). The traditional teaching style and examination oriented teaching at the secondary schools appear to contribute towards students who are more teacher dependent learners. But when teacher is not highly authoritarian, students are willing to give their opinions.

In designing a problem-solving programme of instruction for teaching of English grammar, J.M. Bourke observed that "*[...] problem-solving strategies are the tools one uses and the same tools can be modified to fit a variety of language teaching situations*" in a classroom (Bourke, 2004:105). Language proficiency is important in effective learning and thinking. For example in learning Biology, "*writing their own notes and asking questions during the biology lessons*" is necessary as to avoid the prevalence of rote learning among ESL (English as Second Language) students (Yong, 2003:102). Further he also stated that as these students are ESL learners, it is important that teachers be sensitive and takes into account of the discourse during instruction to suit the linguistic ability of the students (Yong 2003:100). In relation to rote learning, A. Taylor mentions that:

> [...] in education systems that rely on rote learning as a measure of successful scholarship, students are rarely called upon to question or think. Thinking can be stimulated by asking questions which gradually increase in complexity – not difficulty (Taylor, 2001:1092).

In this context, Bloom Taxonomy is useful in enhancing higher order thinking among students in schools. As far as an independent learner is concerned, "*teachers may like to consider adopting reflection as a classroom pedagogical approach*" to help students to be reflective learners (Tan, 2002:101). He continues to say as follows:

> [...] one of the reasons why school may fail to produce independent learners is the lack of opportunities for students to reflect. [...] It is probably true to say that explicit reflection is seldom used as a conscious learning strategy in the classroom. Teacher-led drilling has helped students to perform effectively in national public examinations; in the same way,

teacher facilitated reflective learning can help students enhance and deepen their learning, both now and on leaving school (Tan, 2002:104-106).

Other researchers like C.S. Chai and S.C. Tan suggest an approach known as Knowledge Building Community *(KBC) for developing thinking skills among students. They mention that this approach can* "change the knowledge telling discourse structure of traditional classrooms" *to develop learner's ideas and thinking skills. The sequence of teacher initiates questions, students answer and then teacher evaluates and elaborates on students' answer, is typical in the traditional classrooms (Chai & Tan, 2003:91). What is needed is a hospitable social context for learners to bring in ideas into the classrooms. Meanwhile in teaching history, Lee Su Yin mentioned as follows:*

> *[…] given the proper materials, right guidance and teaching environment, children of all age groups will be able to think, in a variety of ways and can even reach a relatively sophisticated level of thinking. After all, everyone including children has the ability to think and we all think (Lee Su Yin, 1999).*

The researcher gave the following examples to enhance thinking. First, *to develop empathy and heighten awareness of the connection between the past and the present, the teacher can choose a topic on Singapore early settlers then questions about people in the past and the present.* Second, *to develop skills in making judgments by comparing differing interpretations, two accounts on Stamford Raffles – one by John Bastin and the other Syed Hussein al-Atas can be given to students.* Third, *to resolve dilemmas and develop an appreciation for the actions of adults, the "Dilemma of Hang Tuah" may be chosen for various interpretations (Abdul Razaq Ahmad ed., 2005).*

John K. Gilbert, in a workshop, gave a thinking activity on *Venus Flytrap* (a plant) by asking questions "what" and "how". In a group of three students were made to discuss "*What causes rapid movement for the flytrap to catch the flies?*"; and then the second question was "*How does a plant (Venus flytrap) know when to close the trap?*". Two students discussed the problem and the third student observed and records the "two-way" discussion and made a report later on (Gilbert, 2005). What happened in the process of solving problems? So many things happened such as looked at the questions again, looked at information given, discussed and eliminate process, compare and contrast, review and improve, simulation and finally made a conclusion. This is not teaching about facts alone, but is teaching "how to teach explanation". This is an application of ideas to form explanation. What practical measures would you like to take in order to improve the quality of the explanations provided by your students? What problems will you meet in making these changes? How would you overcome these problems?

See table 1 for the summary on measures, problems and solutions on thinking process as follows:

Table 1:
Summary of Measures, Problems and Solutions on Thinking

N	Measures	Problems	Solutions
1	List key words	Language, vocabulary	Involve English teachers
2	Teach the use of analogy	Conservative (school)	Explain the good mission
3	Use diagrams, flowcharts, tables etc.	Students conservative	Students and explanations
4	Teach explanation	School culture	Self-education
5	Use stories	Teachers skills	Training

Problem, Purpose and Method of the Study

According to K. Cotton (2003), in a highly technical society, teaching children to become effective thinkers is a recognized goal of education. Za'im Zaini and Aemy Azlena wrote on "A Generation of Thinkers" in *Borneo Bulletin* (28.10.2007), mentioning that the Sultan of Brunei Darussalam had emphasized on the role of teachers in moulding "a generation of thinkers". Meanwhile in 2005, the Chief Minister of the State of Selangor in Malaysia mentioned that youths have to think about good things 30 minutes in a day and search for new wise ideas. If youths do not think about good things, then they are thinking about bad things and lacking of sense of directions in life (cited by *Mingguan Malaysia,* 15.5.2005).

There are four living skills necessary to be good citizens viz: intellectual skills (ability to generate new ideas), technical skills (tools to do a job), interpersonal skills (ability to communicate with others and accepted personality), and socio-cultural skills (understanding of living environment and make adjustments). Youths are the product of the school system, and A. Taylor in his article on thinking mentioned that "*in education systems that rely on rote learning as a measure of successful scholarship, students are rarely called upon to question or think*" (Taylor, 2001:1092). What are needed in enhancing higher order thinking among students in schools?

The main purpose of the study is to see the reactions of teacher education students on applying the knowledge of thinking culture into the local classroom setting. Specifically, the study seeks to elicit answers on students' current state of thinking, the constraints a teacher faces in integrating thinking skills among students and practical approaches in teaching thinking skills within the constraints.

A group of 40 respondents (final year teacher education students) were exposed to a course on culture of thinking in the classroom. The content includes the language of thinking, idea of the culture of thinking, thinking dispositions, mental management, the strategic spirit, higher order knowledge and teaching for transfer. Besides that students were exposed to the use of Bloom Taxonomy in enhancing higher order thinking among students in schools. Then, they were made to respond to a simple survey questionnaire on the topic concerning the culture of thinking. Questions were related in the current classroom setting, constraints a teacher faces in integrating thinking skills among students and how to redesign pedagogy for teaching thinking skills in the classroom.

Results and Discussion

Table 2 (see below) shows the overall results in analyzing the 15 items concerning students thinking and rote learning (item 1-5), constraints a teacher faces in implementing thinking skills (item 6-10) and changes necessary in teaching approaches (item 11-15). Overall mean score for the 15 items is 3.51. In terms of ranking, the top three ranks, falls in each category, where "*Teaching strategies are constraints*" (ranked 1); "*Change from memory-based to thinking-based learning*" (ranked

2) and 2 items ranked 3rd such as "*Assessment is a constraint*" and "*Emphasis is on memory-based learning*".

From graph 1, clearly it can be seen that the lowest mean score is item 3 (*Students in schools are dependent learners*). It means that some of the respondents agree and some do not agree on students in schools are dependent learners in a formal classroom setting. Highest mean score is item 8 (*Teaching strategies are constraints*). Many perceived that teaching strategies are constraints to teachers in teaching thinking skills. Item 12 is another big constraint in teaching thinking skills in the classroom that is "*Change from memory-based to thinking-based learning*". The whole process in going to take time and it should start at the primary school level. The mission of the school should be in this direction.

Table 2:
Overall Mean Scores and Ranks on All Items (15)

ITEMS	Mean	N=40	Mode	Median	Ranks
1. Students nowadays are not thinking.	3.28	40	3	3	13
2. Students are not active in the classroom.	3.10	40	3	3	14
3. Students in schools are dependent learners.	2.33	40	2	2	15
4. Schools are practicing rote learning.	3.53	40	4	4	8
5. Teachers are worried on the emphasis of rote learning in schools	3.80	40	4	4	3
6. Time is a constraint in implementing thinking skills.	3.53	40	4	4	8
7. Preplanning the lesson is a constraint.	3.75	40	4	4	5
8. Teaching strategies are constraints.	3.95	40	4	4	1
9. Assessment is a constraint.	3.80	40	4	4	3
10. Exam-oriented educational system is a constraint.	3.33	40	3	3	12
11. Integrate thinking skills in the lesson plan.	3.50	40	4	3.5	10
12. Change from memory-based to thinking-based learning.	3.93	40	4	4	2
13. Needs teacher's creativity in imposing culture of thinking in classroom	3.65	40	4	4	7
14. Change exam-oriented to thoughtful Curriculum	3.70	40	4	4	6
15. Teaching thinking skills across curriculum.	3.50	40	4	4	10
Averages	**3.51**	**40**	**3.67**	**3.63**	**-**

According to the respondents, the current classroom situation is teacher-centered where students are less active in classroom activities. The classroom setting is formal and memory-based learning is being emphasized. The results, particularly in table 3, show mean scores and ranking of the statements concerning the current setting in the classroom. The respondents "strongly agree" and "agree" on all the five statements with mean scores ranging from 2.33 to 3.80. The highest mean score is 3.80 that is the classroom is focusing on memory-based learning and the lowest is

a mean score of 2.33 where student teachers felt that students in schools are dependent learners.

Graph showing mean score on 15 items
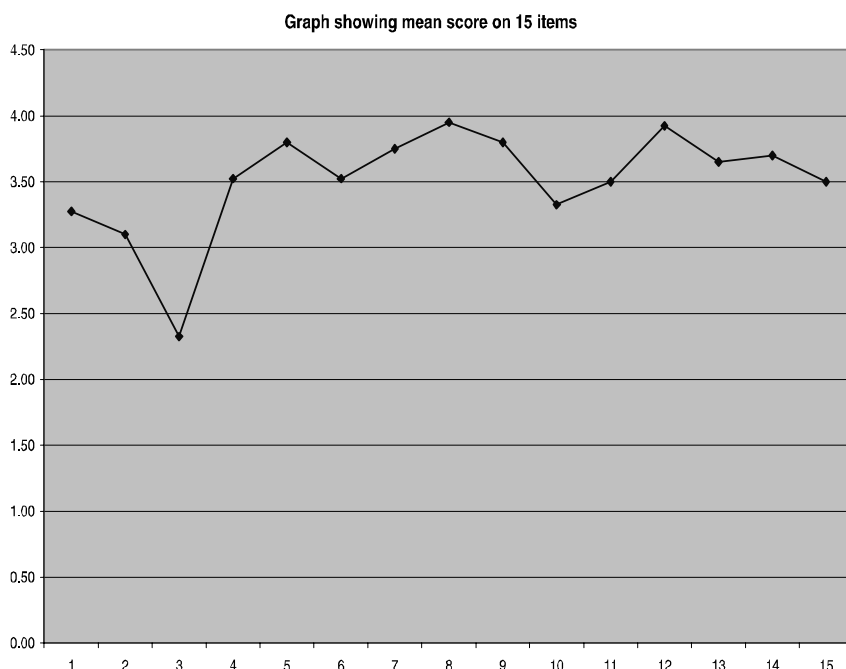
Graph 1:
Mean Score on the 15 Items

Five main changes (table 3) and five main constraints (table 4) are highlighted in the following analysis.

Table 3:
Current Situation on Students Thinking

N	STATEMENTS	N = 40	Mean	Rank
1	Students nowadays are not thinking.	40	3.28	3
2	Students are not active in the classroom.	40	3.10	4
3	Students in schools are dependent learners.	40	2.33	5
4	Schools are practicing rote learning.	40	3.53	2
5	Teachers are worried on the emphasis of rote learning in schools	40	3.80	1

Table 3 shows the mean score of respondents on changes to be made in the current situation on students thinking. Most respondents "strongly agree" and "agree" on all statements except statement on "students are dependent learners" in the classroom which is ranked 5. This means that some students are dependent and some are not dependent learners. Things to be changed according to ranks are: (1) *Teachers are worried on the emphasis of rote learning in schools*; (2) *Schools are practicing*

rote learning; (3) *Students nowadays are not thinking*; (4) *Students are not active in the classroom*; and (5) *Students in schools are dependent learners.* The mean scores of these statements are 3.80 (*Teachers are worried on the emphasis of rote learning in schools*); 3.53 (*Schools are practicing rote learning*); 3.28 (*Students nowadays are not thinking*); 3.10 (*Students are not active in the classroom*); and 2.33 (*Students in schools are dependent learners*).

Although teacher-centered learning dominates the classroom setting and student cannot be active when the classroom is too formal, H.S. Dhindsa and V. Shanmuganathan said that "*Student's traditional thoughts, can influence their learning practices*" but they were willing, to some extent, to give their own opinions in their classes (Dhindsa & Shanmuganathan, 2002). It is natural for students to give their opinions when the teacher is not highly authoritarian. Teachers can make the setting more of student-centered and attempt to integrate thinking culture with student active participation. Accordingly, V. Wilson (2000) argues that "*higher order thinking skills*" need be integrated in the individuals so it will be useful in future.

Student-centered learning is limited (mean 3.53, ranked 2) is not only due to students are passive but language appears to be another barrier that may hinder students from expressing their own views. English was students' second or third language and students' fear a loss of identity when they are unable to communicate effectively (Dhinsa & Shanmuganathan, 2002:23). In learning Biology, "*many students resorted to rote learning*" (Yong, 2003:97) because of inability to understand what the teachers are teaching. He also added as follows:

> […] many secondary school teachers believed that students' performance in biology would be much improved if they had a better proficiency in English. They argued that it is the language that is problematic rather than the biology subject matter (Yong, 2003:98).

Table 4:
Constraints in Integrating Thinking Skills among Students

N	STATEMENTS	N = 40	Mean	Rank
1	Time is a constraint in implementing thinking.	40	3.53	4
2	Preplanning the lesson is a constraint	40	3.75	3
3	Teaching strategies are constraints	40	3.95	1
4	Assessment is a constraint	40	3.80	2
5	Exam-oriented educational system is a constraint	40	3.33	5

Table 4 shows the mean scores on constraints a teacher faces in integrating thinking skills among students. All the statements have the mean scores of 3.50 and above. Statement "*Exam-oriented educational system is a constraint*" obtained a mean score slightly below 3.50 (3.33). So most of the respondents agree and strongly agree on time (mean 3.53, ranked 4); preplanning lesson (mean 3.75, ranked 3); teaching strategies (mean 3.95, ranked 1); assessment (mean 3.80, ranked 2); and exam-oriented system (mean 3.33, ranked 5) are constraints for teachers to implement thinking skills in the present classroom situation or environments.

Teaching strategies are constraints to teachers in integrating thinking skills among students (mean 3.95, ranked 1). The most dominant method of teaching in most classrooms is the expository method or teacher-centered method. For example, in such classes, it is the teachers, who usually dominate the lesson, where students tend to passively involve in the lesson. For instance, there would be hardly any active interaction between students and teachers. In order to implement a culture of thinking in the classroom, the methods/styles of teaching may be changed from traditional teacher-centered to student-centered or constructive learning, whereby students' active involvement in the lesson such as questioning and doing activities are encouraged. Hence, in short, students' engagement in the classroom must be encouraged so that in the long run, they would be able to think creatively and critically, understand a particular concept and able to solve problems.

Although students are influenced by the traditional thoughts, teachers have to be creative and developed "new culture sensitive pedagogies" for teaching and learning science subjects (Dhindsa & Shanmuganathan, 2002). They have to understand the cultural diversity in their classes and to be equipped with methodologies to cope with students from different cultures to produce optimum learning. According to T.L. Koay, W.K. Sim and J. Elkins, in a thoughtful school paradigm, teachers could be encouraged to develop more thoughtful (not thoughtless) teaching/learning strategies such as creative strategies, reflective strategies, responsible strategies and reciprocal strategies (Koay, Sim & Elkins, 2004). What are these strategies?

Examples of *creative strategies* are attempts to use divergent, diverse, novel, innovative ways to enhance teaching/learning. Examples of *reflective strategies* are attempts to regularly reflect on teacher's possible or actual actions aimed at improving teaching/learning. Reflect from time to time on the effectiveness, efficiency, equity of the pedagogical processes, rather than to mechanically implement what has been decided upon. Under *responsible strategies*, teachers should always be aware and concerned about the possible impact of what they do with a group of pupils, the school, the homes and the community. They have to monitor the outcomes or effects of teaching/learning on various students and teachers themselves. In *reciprocal strategies*, teachers need to collaborate or network with others rather than working alone. There should be attempts to promote collaboration and sharing of mutual benefits in improving teaching/learning (Koay, Sim & Elkins, 2004:52).

Assessment is a constraint in implementing thinking culture in the classroom (mean 3.80, ranked 2). At the moment the educational system is much examination-oriented, where most teachers and students are mainly concerned with passing of the examinations at the end of their academic year. In other words, teachers are more concerned in giving/feeding students with voluminous facts in order to cover the whole syllabus for examination purposes. Hence, thinking is less practiced. Table 5 shows the statements considered necessary in redesigning pedagogy for teaching thinking skills in the classroom.

Table 5:
Redesigning Pedagogy for Teaching Thinking Skills in the Classroom

N	STATEMENTS	N = 40	Mean	Rank
1	Integrate thinking skills in lesson planning	40	3.50	4
2	Change from memory-based to thinking-based learning	40	3.93	1
3	Needs Teacher's creativity in imposing culture of thinking	40	3.60	3
4	Change Exam-oriented to thoughtful curriculum	40	3.70	2
5	Teaching thinking skills across curriculum	40	3.50	4

There is a need to redesign the pedagogy such as changing from memory-based to thinking-based learning (mean 3.93, ranked 1); changing exam-oriented curriculum to thoughtful curriculum (mean 3.70, ranked 2); needs teacher's creativity in imposing culture of thinking (mean 3.60, ranked 3); integrating thinking skills in lesson planning (mean 3.50, ranked 4); and teaching thinking skills across curriculum (mean 3.50, ranked 4). All the statements have the mean scores of 3.50 and above. The respondents strongly agree with all of the statements but the strongest of all is "*changing from memory-based to thinking-based learning*" (mean 3.93, ranked 1). The mean score is 3.93.

In order to implement a culture of thinking, where students are likely to engage themselves in problem-solving, thinking actively in classes, it is important to orientate the current type of students assessment or evaluation from testing students' ability in memorizing voluminous facts into assessments that would test their thinking abilities and creatives. A change in exam-oriented curriculum to thoughtful curriculum (mean 3.70, ranked 2) is highly agreed by these student teachers. In other words, teachers must be more concerned with thinking related assessment and curriculum. This is in line with "*teaching children to become effective thinkers to function successfully in a highly technical society and they must be equipped with lifelong learning and thinking skills necessary to acquire and process information in an ever-changing world*" (Cotton, 2003). Further, A. Abdul Shukor (2001) reiterated that in order to cope with the fast changing world where new knowledge is being produced daily while old knowledge is being reorganized and redefined, to teach the children how to learn and how to think is highly appropriate.

IMPLICATIONS

In redesigning pedagogy in integrating thinking culture in the classroom, the followings are considered: lesson planning, thinking-based learning, teacher's creativity, thoughtful curriculum and teaching thinking skills across curriculum. As life is becoming more complex, jobs are disappearing fast, and knowledge and information are the most important input in modern productive system, thinking skills are much needed in the educational system. So in agreeing with the ideas of V. Wilson where "*higher order thinking skills*" need be integrated in teaching due to insufficient knowledge storage in student's memory, rote learning has its limitations. Individual students require transferable skills to allow them to address different problems in different contexts at different times throughout their lives (Wilson, 2000).

Changing the approaches progressively, from teacher-centered to student-centered in the classroom setting, is possible. The implementation is progressive in nature with 80% teacher-centeredness at the beginning of the year and ends up with 80% student-centeredness at the end of the year. There are four implications here: (1) teachers must be well equipped with the various approaches and methods of teaching; (2) teachers must be well trained in the culture of thinking in the classroom; (3) schools must have goals in developing independent learners and thinkers; and (4) schools must encourage the implementation of teaching approaches that develop thinking students and thinking culture in a progressive manner.

Conclusion

In integrating thinking skills in the classroom teaching, there are changes and constraints teachers have to face. Teachers and teaching in the classroom need reorientation for the integration of teaching thinking skills. Most teachers came to conclude that thinking culture is difficult to implement because the students were used to the traditional approaches of teaching. Constant attempts have to be made in all teaching activities with thinking culture environment.

Implementing thinking skills takes time. Teachers have to be familiarized with the thinking culture before thinking skills culture could be successfully implemented in the classroom. This study is preliminary and more to be developed in the area. Further research on other aspects, such as language of thinking, thinking dispositions, mental management, strategic spirit, higher order knowledge and teaching for transfer, could be carried out in the near future.

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