

Mathematics Learning Now And Will Come

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Abstract

Learning with heart is a human humanizing efforts. When human behavior are currently not shown as a caliph who keep the peace in life and life, such as a fast felt shortcut behavior, then the system should be reformed education and teaching. A learning model that forms an ability to think logically, critically, creatively, consistently and foster a sense of confidence and character is on student-centered learning which of them through constructive stages, interactive and reflective.

Keyword: learning, mathematics, now and will come

Preliminary

Advancement of knowledge and technology to get the better of someone demanding information and knowledge. Thus needed to be able to acquire, select and manipulate information. The faculties requires critical thinking, systematic, logical, and creative. Thus it needs an education and teaching programs which can develop the ability to think critically, systematic, logical, and creative. One of the learning program which can develop the ability to think critically, systematic, logical, and creative is math. (Wittgenstein, 1991). Mathematics is a way to find answers to the problems facing mankind, a way to use the information, using knowledge of shapes and sizes, using the knowledge of the count, and the most important is to think of the man himself in look and use relationships.

Many members better define the meaning of mathematics in general or specifically. Hudojo (1998) states that: "mathematical ideas is given abstract symbols that are arranged in a hierarchical and deductive reasoning, to learn mathematics is a high mental activity." While James in dictionary mathematization stating that "mathematics is the science of logic the form, arrangement, scale and other concepts relating to a large number of which are divided into three areas, namely algebra, analysis and geometry. Known as deductive mathematical knowledge, because every method used in finding the truth is to use deductive method, is in the natural sciences or experiments using the inductive method. For example, if we want to proof that large amounts triangle angle is 180o, then we should use the previous theorem or by using large angle postulates that half circle or a straight line angle is 180o. Obviously, if we want to prove the theorem three, then we can only use the theorem on two or one, and so on. Although, in the mathematical search for the truth can be started with inductive way, but right next to all the circumstances should be able to be proved deductively, because of the nature of mathematics, theory / proposition can not be accepted before the truth can be proven deductively.

Mathematical learning about the order, the structures organization, mathematical concepts are arranged in a hierarchical, structured and systematic, ranging from the most simple to the concept of the most complex concepts. In mathematical objects learned policy is abstract, so that called mental objects, the object is objects. The object of the policy include: concept, is an abstract idea that is used to classify a group

objects. For example, the triangle is the name of an abstract concept. In mathematics there is an important concept of "function", "variable" and "constant". The concept is closely linked to the definition, the definition is the expression of a concept, with definition can make an illustration or picture or symbol of the concept in question. Principle, a complex mathematical objects. Principle can consist of a number of concepts linked by a relation / operation, in other words, the principle is the basis of relations between the various mathematical objects. Principle can be axiom, theorem and properties. Operations, the execution count, workmanship algebra, and other mathematical workmanship, such as summation, multiplication, combination, sliced. In mathematics are all sorts of operations that is unair operations, binary, and dependent many elements operate. Summation is a binary operation because there are two elements operated, but additional number is operational unair because only one element. Vision of mathematics education today is mastery in learning mathematical concepts used to problems solve. While the vision of the future of mathematics education is to give the opportunity to develop the mindset, self confidence, beauty, objective and open attitude.

National Research Council (NRC, 1989:1) of the United States has stated: "Mathematics is the key to opportunity." Mathematics is the key to success opportunities. For a student, studying success will open the door an excellent career. For the citizen, mathematics will support the right decision, and for a country, mathematics will prepare citizens to compete and to compete in the field of economy and technology. Further stated that: "Mathematics is a science of patterns and order." That is, mathematics is the science that addresses the pattern or regularity (pattern) and form (order). It is clear now that mathematics can be seen as a language that describes the patterns, both patterns in nature (*kauni*) and or patterns found through our minds. The patterns can form real (real) or shaped imagination, visible or just in the form of mental (mind), static or dynamic, qualitative or quantitative, native connected with real life day-to-day or no more than just for recreation needs . These things can emerge from the surrounding environment, from the depths of space and time, or the work of human thought. So, for the present and for some time to come, the ability to think and reasoning much needed as stated NRC (1989:1) the following: "Communication has created a world economy in Selatan working SMARTER is more IMPORTANT Jobs That contribute to this world economy Require workers who are mentally fit workers, who are Hilman to Biology new ideas, to adapt to change, to cope with ambiguity, to perceive patterns, and to Solve unconventional problems. "In the present and the time to come, in the era of communication and advanced technology, it is a smarter workers (SMARTER) of hard labor (Harder). Need to workers who had been prepared to be able to digest new ideas (Biology new ideas), capable of adapting to changes (to adapt to change), able to deal with uncertainty (cope with ambiguity), was able to find regularity (perceive patterns), and were able to resolve problems that are not common (unconventional Solve problems).

Correspondingly, the National Council of Teachers of Mathematics or NCTM (2000), states that school mathematics standards cover the content standard (mathematical content) and standard process (mathematical processes). Still according to the NCTM, the standard covers the process of problem solving (problem solving), reasoning and argumentation, connections, communications, and representation. Standard process together is a skill and a basic understanding of the

students' immediate needs in the 21st century (Together, the Standards describe the basic skills and understandings That Students will need to function effectively in the twenty-first century).

Ministry of National Education (2006) has stated that the purpose of learning mathematics in school is that learners have the ability: 1) use the pattern and nature of reasoning, perform mathematical manipulation of generalization, compile evidence, or explain mathematical ideas and statements, 2) resolve issues include the ability to understand the problem, planning mathematical model, solve the model and interpret the solutions obtained, 3) communicate ideas with symbols, tables, diagrams, or other media to clarify the situation or problem, 4) have the attitude to appreciate the use of mathematics in life, of having a sense of curiosity, attention, and interest in learning math, and tenacious attitude and confidence in solving problems.

Behaviors and characteristics of a mathematical (Kline, 1968, Bell, 1978; National Research Council, 1989, and Souviney, 1994), mathematics has a great potential to provide a wide range of abilities, and attitudes needed by humans that can live intelligently (intelligent). The faculties which can be obtained from mathematical inter alia: a) ability to count, b) the ability to observe and reflect geometric buildings in nature combined with spatial properties (spatial properties), respectively, c) ability to perform a wide range measurement of length, area, volume, weight and time, d) the ability of observing, organizing, describing, display, and analyze data, e) ability to perform the quantification of the various variables in various areas of life, so that a relationship between the variables and the variables that others can know more exact, f) the ability to observe the pattern or structure of a situation, g) the ability to distinguish relevant matters and matters that are not relevant to a problem, b) the ability to make predictions or forecasts about a case based on data available, i) the ability to think logically, including the ability to detect the presence of a contradiction in reasoning or action, j) our ability to think and act consistently, k) our ability to think and act independently (independent) on the grounds that accountable , l) our ability to think creatively, and ability to solve problems in a variety of situations. In addition to being able to give the faculties, the field of mathematical study is also useful to instill or reinforce certain attitudes. Attitudes that is grown through other areas of mathematical study is careful attitude (carefully), critical attitude, attitude efficient, persevering attitude, consistent and have that universal truth. Thus, a case that stage Copernicus and Galileo (1645) said that "Mathematics is language in Selatan, God wrote the Universe".

Recognizing the importance of mathematics and its role in the face of life and the progress of science and technology and global competition the quality improvement of mathematics education at all level of education should be a priority to be improved. Thus, the question is is how the mathematical values can be understood, implemented and epitomized by everyone so that people living in the world as caliph.

Discussion

Education is a conscious and planned effort to create an atmosphere of learning and the learning process so that learners are actively developing his potential to have a religious spiritual strength, self-control, personality, intelligence, noble character, as well as the necessary skills themselves, society, nation and country. UUSPN No. 20/2003 [Chapter I Article 1: 1]. From this definition, the study must To improve the cognitive domain, affective and psychomotor, according Taxonomi developed by Bloom. In 2004, the United Nations Educational Scientific and Cultural Organization

(UNESCO) to launching a movement that wants to four contract commitment. First commitment contract called "contract commitment to the earth". Contract commitments was born and placed on the first order for the action and keep balance of natural ecosystems can not be bargained again should start soon and the start now. If done tomorrow might be too late, So the real action against this contract the first commitment was to be done now - not tomorrow, let alone later - and all parties should be involved or be forced to get involved. Second commitment contracts known as 'cultural commitment contract'. The main purpose of this contract is to maintain its commitment to human civilization, fortify humanity, and ensure that the actions of humanists always be judged in each individual being and behaving. Third commitment contract is known as 'social commitment contract'. Expected from this third contract is more do justice not only by the state and the ruler but also each of the individual, because the facts in the real world shows that most of the human rights violations committed by the individual thus, even though the scale of the breach was not too big. The contract also want to make sure that the process towards democratization and gender equality continues to take place with the right speed and direction. Fourth contract commitment is called 'ethical commitment contract'. Ethics, as an important part of the study of philosophy, it is assumed the heavy burden as a controller and individual drivers behave, do, act, and treat his neighbor. Own ethics as a branch of philosophy it has been divided into three different level, ie (1) normative ethics, (2) applied ethics, and (3) meta-ethics. Normative ethics and meta-ethics course important from the standpoint of knowledge, it is impossible to understand 'applied ethics' if resources are not well understood.

Education to Come

Prepare human resources to meet new and better order based on the fourth contract will require life long education for all and a curriculum for 21st century. based on the four pillars of education outlined UNESCO. First, learning to be-so that people without looking at its origin is able and willing to learn from each event dynamics of social life as a community and work independently as a human being. Second, learning to know, humans should be able to see the situation and conditions and understand the meaning of life. Third, learning to do - humans should try and live up to its capacity. Fourth, learning to live together-the ability to do something that can be felt and beneficial for many people.

Despite the 21 century had walked long enough, but the concept is that now everyone is entering the 21st century, but can still be used. At this point the role of information and communications technology does show the remarkable progress and is very significant and necessary for the implementation of the four pillars of education. 21st century is the era Learning Society - Community learners - which allows each person to learn and access information that wherever without limited space and time. Thus, the to be question is "what is the role of professors and teachers in this era Learning Society?"

Lecturer and teacher role definition will no doubt be formulated over. Formulation repeat it was done, should be done again. This is due to a fact that happens in life and life as a product of the education system that happens has happened now in a behavior "felt fast shortcut". Therefore, should be an effort to reform teacher education once profess to be student centered centered. Pedagogical competence and knowledge transfer skills on professors and teachers experience changes quickly, and

overall terrible. Lecturers and teachers in learning era society claimed to be capable of delivering learning topics in the form of animations, movies, games, and interactive multimedia that everything should be framed by an attractive display of style while demand high quality content. Lecturers and teachers claimed to be able pours all its forms of knowledge - theoretical or applied - in electronic books (e-book) that can be accessed by the beneficiaries of proteges online 24 hours a day, seven days a week, four weeks a month, and twelve months a year. Or in other words, anyone, anytime, anywhere, all members of society should be able to continue learners learn and learn. The central role of teachers in all educational institutions are promoting the level of soft-skills which include values: honesty, respect, tolerance, the ability to listen, empathy, cooperation, politeness, self-discipline and control. This can only be promoted by professional educators who have the ability to use technology in learning and transfer the values of life (living values) on each of the students.

Potential of Information and Communication Technology (ICT) in Learning Mathematics

The development of information and communication technologies has given particular influence on the world of education in the learning process. According to Rosenberg (2001), with the widespread use of ICT has five shifts in the learning process, namely: (1) the appearance of the training, (2) from a classroom to where and at any time, (3) from the paper to the "on line" or channel, (4) physical facilities to networking facilities, (5) of the cycle time to real time. Communications as media education is done by using communication media such as telephone, computer, internet, e-mail, etc.. Interaction between teachers and students is not only done through face-to-face contact but also done by using the media. Teachers can provide the service without having to deal direct with the students. Similarly, students can get information on a wide scope of different sources through cyber space or virtual space using a computer or the internet. The most recent case is the development of so-called "cyber-teaching" or virtual lessons, that the teaching is done by using the internet. Another term is more popular current e-learning that is a model of learning by using media and information communication technology in particular the internet. According to Rosenberg (2001: 28), e-learning is the use of internet technology in the delivery of a wide range of learning base three criteria, namely: (1) e-learning is the network with the ability to renew, store, distribute and share the teaching materials or information , (2) shipment to the end user via a computer using standard Internet technology, (3) focus on the broadest view of learning behind traditional learning paradigms. Current e-learning has grown in various ICT-based learning model as: CBT (Computer Based Training), CBI (Computer Based Instruction), Distance Learning, Distance Education, CLE (Cybernetic Learning Environment), Desktop videoconferencing, ILS (Integrated Learning System), LCC (Learner-Centered Classroom), Teleconferencing, WBT (Web-Based Training), etc.

In the times to come, will information flow through the Internet and the increasing global nature around the world and claim anyone to adapt to the tendency would otherwise outdated. With this condition the education particularly fast or slow learning process can not be detached from the presence of computers and the internet as the main tool. Asiaweek magazine 20-27 August 1999 issue revealed in the writings of the theme "Asia in the New Millennium" which give a different tendency development will happen in Asia in many aspects such as economic, political, religious, social, cultural, health, education , etc..including in it the influence of the Internet revolution in the various dimensions of life. One of the world's writing concerning the education

delivered by Robin Paul Ajjelo with the title "rebooting: The Mind Starts at School". In the script submitted that a classroom in the coming millennium era will be far different from the classroom as it is now that is in the form of a computer lab where there are no other formats and son sitting on the bench in front of the class teacher. Classrooms in the future is referred to as "cyber Classroom" or "virtual classrooms" as the kids do learning activities individually or in groups to learn the pattern called "interactive learning" or interactive learning through computers and the internet. Children dealing with computers and do interactive learning activities through the Internet to obtain study materials from various sources to learn. Children will perform appropriate learning activities to condition its individual ability to slow or fast children will acquire the appropriate service learning with him.

That has changed the role of teachers and students in learning. The role of teachers has changed from: (1) as a purveyor of knowledge, the main source of information, material expert, and the source of all the answers, be as facilitators, coaches, collaborators, knowledge navigator, and our study, (2) the handling and directing all aspects learning, becoming more and more provide more alternative and responsibility to each student in the learning process. While the role of students in learning have evolved, namely: (1) from a passive recipient of information to be active participants in the learning process, (2) from revealing back and wide knowledge to produce knowledge, (3) from learning as activity individual (solitary) be collaborative learning with other students.

Learning mathematics present and future From the characteristics and common purpose to learn mathematics, then the specific purpose of school is to make learning math beings who have a balanced three important components namely knowledge, skills, and attitude to be able to maximize the potential of human intelligence have, not just IQ but also EQ (attitude), and SQ, (skill / high order), so they are ready to compete in the outside world at the time. Skill here is more on the high order skills, such as how to not be ashamed to present the views accompanied with a logical reason, problem solving, debates etc. opinion. Therefore, in practice, the process should be much preferred to think in only oriented on results. Attitude that can be nurtured among them hard, not afraid of difficulties, always looking for a challenge, enjoy the process, and he can enjoy and appreciate what they have learned. George Polya (1974) say that learning mathematics is a good school to think, think how break a problem, not only practical problems but also abstract problems, so that they can be able to develop the students ability because he has a good policy in problem solving. And this will be very much needed in the future.

Atwood (1990) says that traditional teaching pattern as a way of teaching, teachers were actively explain and give information, not help students develop thinking skills and good interpersonal intelligence. In this respect, then there is a fundamental question that needs to be considered, namely: how mathematics can be taught better, how their children are encouraged to be interested and interested in math, indeed how children learn mathematics, and what is the value of mathematics for them? Treffers, De Moor and Feijs (1989) says that there are three pillars in the development of mathematics education that will mean mathematical values, morals and character of the individual personality and be leading comparative patterns of thought, patterns of behavior and patterns of response, namely; constructive, interactive and reflective.

a. Constructive

This attribute is stating that mathematical learning is construction activity, that students find their own concepts, principles or procedures for himself. Students construct internally, mental representations that can concretize these descriptions, schemata, procedures, working methods at the level of abstract symbols, intuition-intuition, contexts, schemata solutions, or by trial-trial. Features of the constructive nature of this is students find themselves breaking procedure from a contextual problem. So this point is familiar students on the environment.

b. Interactive

These characteristics explain that learning is not just an individual activity but something that happens in society and in relation to the social cultural context. Interactive Learning called cooperative learning (Slavin, 1986), "class conversations, 'instructional reciprocity', 'construction, driven by knowledge' and 'instructional interactive' (Treffers & Goffree, 1985). With a PhD candidature will form a critical mindset, emotions and behavior in delivering democracy or morality or accept ideas of others.

Interaction in learning can provide satisfaction, both for teachers as educators and teachers and for students (Manullang, 2005). Satisfaction is a rational relief when an occupation or activity carried out with the best technical implementation. In the interaction logic functions and ratios found. Logical arguments and correct ratio would provide satisfaction for the truth. Learning interaction to give happiness for grilles and students. Happiness is excitement that is felt from a job or activity. Students because teachers can easily empathy in their students, and teachers are happy because it can provide happiness for your students. In this case, teachers understand that the offense committed is not of one's students, but because of lack of information they have. Thus, this interaction will grow principle 'understand means to forgive everything "(taste for learning with aheart). With the atmosphere of a positive character that grows. Learning interactions will engender pride, dignity or honor (dignities) for educators and educated. Pride is a character created by a job or activity because to be holistic mastery learning.

c. Reflective

According to Hiebert (1992), reflection or metacognition can be defined as a conscious judgment about his own experience, often the link between ideas and action. Reflection remembering back on his own experience, and take as the object of critical thinking experience. Reflection begins when asked about yourself, how the best approach to reach the problem: 'Should I do it that way?' (Planning). So we set to work, other questions arise: "What tillaged true?" (Self-monitoring), perhaps even "Can I do that?" (Self-evaluation). Other questions are real is "Will this work?" (Anticipation) and, finally, "Am I happy with this?" (Evaluation). If the solution cause a stalemate, then driven to ask myself "Did I not try something else?" (Considering; switching methods). These are the elements of the most important reflection for problem-solving process.

So, the learning process now it's time to focus on critical thinking competency enhancement and reflection learning, interaction and expansion of the concept of specific thinking like regularity and consistency (Davydov, 1982; Stepanov & Semenov, 1985; Zak, 1984). While Leont'ev (1980), and Van Oers (1987) stated that education

and teaching that is centered on the students (student-centered) is seen as an active interrelation of symbolic and cultural meaning systems. Learning takes place in a social context (Bruner, 1996; Slavin, 1986). Learning is a process by which children learn to dominate culture through symbols. Associated with it, then the education sector through a learning process which refers to the increase in critical thinking, logical, creative and social-emotional intelligence, have interviewed-do and enhanced through the conditioning of the context of problem solving in an interactive form of challenge to the real world. The most important thing is teaching is done not only aims to enable students to easily understand the lessons learned, but as well as improve performance in the study is also to find solutions to a variety of concepts and models, solutions to problems and increase their consciousness will always behave the democratic and humanist. Other education experts, Resnick (1987) says that the study is not itself absorbed passively, but integrate prior knowledge with new information, and developing a new meaning. So learner be able not only to the facts and skills-skills, but to organize and develop their strategies on their prior knowledge combined with new information. Whereas, Oleinik (2002) says that to improve students' critical thinking, one of them is to use based on student learning (student-centered). During the learning process above will be born attitude to convince themselves and others in a rational and will grow to understand means to forgive everything attitude.

With five purpose of learning math on it is clear that the goal was in accordance with the latest issu and the latest tendencies (the newest trends) in the field of mathematics education. Implications, each of the parties not to hesitate to earnestly implement the curriculum instruction to fifth goal can be achieved with good. In theory, skills, think, behave and act can be enhanced through learning refers to the constructive nature of learning, interactive and reflective. Learn math is to learn to live with the norms. Maths is a way of life to achieve peace. To understand and explore the mathematical principles, the principle of life is harmonious. Hateful war is not in accordance with the principles of mathematics. Maths is a beauty.

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