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The 5th
International Conference On
Educational Research and Innovation

ICERI

OPTIMIZING EDUCATIONAL RESEARCH FINDINGS TO IMPROVE THE QUALITY OF LIFE



CONFERENCE PROCEEDINGS

Institute of Research and Community Services Yogyakarta State University
May, 8-9, 2017

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MESSAGE FROM THE RECTOR OF YOGYAKARTA STATE UNIVERSITY

Assalamu'alaikum warahmatullah wabarakatuh.
May peace and God's blessings be upon all of us.

Welcome to Yogyakarta, Indonesia

It is a privilege for Yogyakarta State University to have the opportunity to organise this conference in which educational researchers and practitioners get together to share ideas, experiences, expectations, and research findings. This conference is one of the agendas of Yogyakarta State University to celebrate its 53rd anniversary. It also marks the new era of Yogyakarta State University with its new leaders and leaderships with new priority programs hoping to excel this university to the new level that is internationally recognized – the World Class University.

One effort that this university is doing is making sure that fruitful research is among the priorities. So far, however, the research findings produced by universities, research institutes, schools, and practitioners have not been optimally disseminated and utilized and have not produce maximum impact on the improvement of quality of life. Findings of research should be able to benefit not only for the researchers themselves and their limited communities, but also to the wider communities and worldwide. This is what Yogyakarta State University wants to promote, while improving its impacts to the scientific life worldwide by encouraging researchers to publish their articles in internationally reputable journals.

This fifth International Conference on Educational Research and Innovation (ICERI), in particular, aims at facilitating researchers, educators, scientists, and students to exchange and share their experiences, new ideas, and research findings about all aspects of education, research and innovation, and discuss the practical challenges encountered and the solutions adopted to improve the quality of life. With the commitment to improve the impact of research, this year theme is "Optimizing Educational Research Findings to Improve the Quality of Life."

Finally, let me acknowledge the hard work of all committee members who have devoted their time and energy to make the conduct of this conference possible. I would also use this opportunity to wish all of you a happy conference and hope this conference be one of the conferences that really contribute to the upbringing of the scientific life.

Wassalamu'alaikum warrahmatullah wabarakatuh.



Yogyakarta, 8 May 2017

Rector,

Prof. Dr. Sutrisna Wibawa, M. Pd.

MESSAGE FROM THE ORGANIZING COMMITTEE

Assalamu'alaikum warrahmatullah wabarakatuh.
May peace and God's blessings be upon you all.

First of all allow me to extend my warmest greetings and welcome to you all to the 5th International Conference on Educational Research and Innovation, organized by Yogyakarta State University to celebrate its 53rd anniversary. The conference is held for two days – May 8 and 9, 2017.

Raising the theme – Optimizing Educational Research Findings for Improving the Quality of Life - this conference is designed to explore how various findings of educational researches and applied researches from academicians, researchers, practitioners, educators, bureaucrats, teachers, and students are optimized to improve the quality of life. Hopefully, this conference will contribute various inspiring innovative thoughts and proactive strategies for the systemic and sustainable improvement of the quality of life.

For your information, we will proudly present one keynote speech, three plenary presentation sessions and four parallel presentation sessions. Seven outstanding speakers in the field of character education and educational research have been invited. They are Prof. Laurance Splitter, Ph.D. from Education University of Hong Kong, also representing Asia Pacific Network for Moral Education (APNME), Prof. Richard Luke Daniels from the College of Idaho, USA, Dee Dee A. Salle, Ph.D. , an Exercise Physiologist, Nutritionist, and Consultant from Singapore, Dr. Minako Sakai from the University of New South Wales, Australia, Dr. Nurul Taufiqu Rochman, M.Eng., Ph.D. from Indonesian Institute of Sciences (LIPI), Indonesia, Dr. Deendarlianto from Universitas Gadjah Mada, Indonesia, and Prof. Dr. Sri Atun from Universitas Negeri Yogyakarta, Indonesia,

We have done our best to prepare for this conference. So, my highest appreciation and heartfelt thanks to all committee members. As to err is human, shortcomings may occur here and there. On behalf of the committee, I would therefore like you all to accept our apologies.

At the end of my speech, I would like to kindly request the Rector of Yogyakarta State University to officially declare the conference open.

To conclude, let me wish you a productive discussion and a fruitful conference.
Wassalamu'alaikum warrahmatullah wabarakatuh.
May peace and God's blessings be upon you all

Yogyakarta, 8 May, 2017
Head of Research Institute and Community
Service of Yogyakarta State University

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CONTRIBUTION OF MATHEMATICAL EDUCATION IN IMPROVING QUALITY OF LIFE STUDENT BASIC SCHOOL

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Abstract

Believe it or not, please take a look at the phenomenon of life that everything happens because of a causal relationship. When we experience a pleasant or sad event and then try to introspect ourselves then ask why this is happening, surely we can find the cause as the answer. This study aims to reveal the importance of training the mindset of students based on the concept of mathematical logic from an early age, so that unpleasant events will not be repeated again, so as to improve the quality of life of students in the future. Through ex post facto research with survey method shows that not many teachers are able to give stock to the students so that later can live quality. The result of the research is the data obtained from 58 active students from teacher and education faculty who have worked as teachers in elementary, junior high school. Samples were randomly assigned from those who enrolled the teaching practice course. Through an interview questionnaire, 93% said it was unthinkable to associate the concept of mathematical logic with the preparation as a provision of quality living for their students. As many as 7% say they've tried to link it, but still doubt whether the way that is done is correct or not. It can be concluded that they need training, motivation to become teachers who are able to use the concept of mathematical logic as the basis of logical mindset in order to familiarize the students avoid disappointment. Furthermore, teachers and parents who have elementary school age children are expected to be able to familiarize and instill logical mindset for elementary students. Habits can be started through simple examples such as when teachers' pay attention, are there students who are sleepy when listening to teacher explanations? If there is then the student should be approached, asked for example what time of night sleep, why sleep late?, from student answers can be used as an example of a bad result and please remember not to be repeated again so tomorrow can lead a better life.

Keywords: mathematics education, quality of life, elementary school.

1. Introduction

In everyday life must be many kinds of events that can be used as material for example or media learning for any field of study, especially the field of study of mathematics education. No matter believe it or not, but it's all the reality of life that everyone likes to live happily and everyone would not want to live hard. Please research by looking at every life phenomenon that everything that happens because of a causal relationship. When we experience events that are either fun or sad events then try to introspect ourselves by trying to ask ourselves why this happens, surely we can find the cause as the answer. Attention to this phenomenon is so important that unpleasant events will not happen again. If associated with character education then this introspection habits can make a person who is not arrogant because whatever happened to him is definitely no reason. Mathematics education teachers are expected to have been able to inculcate the

concept of logical thinking through the concept of logic implications and biimplications.

Learning mathematical logic means learning to think or reason which is a regular activity of human reason with the knowledge we receive through the five senses and then processed and aimed to achieve a truth. By thinking we learn to judge something so that it can be concluded the benefits of learning logic is that we manifest the mind to be able to consider, ponder, analyze, convey the argument, prove something, classify, compare, draw conclusions, examine the way of thinking, find causes, discuss in reality and others, other. Another benefit of studying logic, in order to think logically, critically, precisely, coherently, consistently, and correctly.

There are several reasons that can be put forward by Sumaryono (1999) why we need to study logic [1]: 1) Logic educates us to think clearly and critically, 2) Logic enables us to carry out the necessary intellectual discipline in concluding or drawing conclusions, 3) Logic

helps us to interpret facts and opinions of others adequately, 4) Logic trains us on how to set assumptions and Implications, 5) Logic helps us detect erroneous and unclear reasoning, 6) Logic provokes scientific and reflective thoughts, so it can be said that the Logic of Mathematics is closely related in everyday life.

Implication

Implication according to Rachmiazasi (2016) is a mathematical logic with the concept of logical conformity. Both statements will be linked by using symbol (\Rightarrow) meaning read "**if p then q**". For more details please note in the following truth table [2]:

p	q	$p \Rightarrow q$	Mathematical Logic
B	B	B	If initially TRUE then finally TRUE then concluded TRUE
B	S	S	If initially TRUE then finally FALSE then concluded FALSE
S	B	B	If initially FALSE then finally TRUE then concluded TRUE
S	S	B	If initially FALSE then finally FALSE then concluded TRUE

$p \Rightarrow q$ otherwise read "if p then q"; can also be read "q only if p"; "p requirement is necessary for q"; "q sufficient condition for p"; For statement "p" called antecedent or hypothesis and "q" are called consequence or conclusion.

Implication $p \Rightarrow q$ is true if the consequences are true or antecedent and consequently both are false, and are false if the antecedents are true, whereas the consequences are false.

Biimplication

On biimplication, Rachmiazasi (2016) the statement will be concluded correctly if both of them have equally true or false values. Additionally, statement will be inferred incorrectly. The bi-implication is indicated by the symbol (\Leftrightarrow) meaning can be read "**p if and only if q**" [2].

p	q	$p \Leftrightarrow q$	Mathematical Logic
B	B	B	p is TRUE if and only if q is TRUE (concluded true)
B	S	S	p is TRUE if and only if q is FALSE (concluded false)
S	B	S	p is FALSE if and only if q is TRUE (concluded false)
S	S	B	p is FALSE if and only if q is FALSE (concluded true)

$p \Leftrightarrow q$ otherwise read "p if and only if q" (often abbreviated "p jhj q") can also be read "if p then q and if q then p"; "p is necessary and sufficient for q"; q necessary and sufficient conditions for p
 Biimplication $p \Leftrightarrow q$ is true if both antecedents and consequences are either true or both are false. If this is not the case then the biimplication is false.

In carrying out the task of teaching mathematics, often the most important for the teacher is how to understand the material to be taught, choosing the right learning strategy when about to deliver the material, prepare the media and examples in the events of everyday life that is appropriate and has been experienced by students for easy concept Understandable students. How can a teacher to train students to think logically in every problem, and how appropriate solutions to solve them, this is a phenomenon untouched by the teacher education

training program. Yet by having logical thinking, we can create a better and more mature life plan and able to make a good priority in determining a decision-making choice. Not only that, by thinking logically, we are not easily fooled and cheated by others. Logical thinking makes us able to analyze what other people are talking about and doing, what is the purpose of both, and what we should do or what our response is to avoid that we are not stuck with what people say and do around us. Logical thinking can make us not only follow the flow without having a clear rationale of what we decide. For teachers it becomes very important to understand the concept of logic especially on the concept of implication, biimplication and trying to develop it through various examples it will form a logical mindset that can be utilized as stock when it comes to making decisions to avoid wrong decision.

Many factors influence when people have to make decisions, including the ability to communicate and the ability to argue. Zins (2001) has compiled from various studies on the positive effect of children's emotional intelligence on success in school. There are several risk factors that cause child failure in school. The risk factor does not lie in intellectual intelligence, but in emotional intelligence is often called character [3], such as the ability to work together, self-confidence, ability to concentrate, and communication skills. Communication ability is closely related to the ability to argue, as the basis of argumentation is a logical mindset that comes from arguments in mathematical logic. According Hartati (2013) in general there are two kinds of arguments, namely: valid and invalid arguments [4].

Valid arguments consist of:

- 1) Silogisme Disjungtif (DS) : $p \vee q$
 (*Disjunctive Syllogism*) $\sim p$
 $\therefore q$

In the disjunction syllogism, the initial statement "p or q", if that happens "not p" then the conclusion is "q". Teachers should be trained to be able to create the feel of a statement sentence that can be given as an example in everyday learning such as "pingin your life successful or your life miserable", if your life is not successful then the conclusion of your life miserable.

- 2) Modus Ponens : $p \rightarrow q$
 (*Modus Ponendo Ponens*) p
 $\therefore q$
- 3) Modus Tollens (MT) : $p \rightarrow q$
 (*Modus Tollendo Tollens*) $\sim q$
 $\therefore \sim p$
- 4) Hipotetikal Silogisme (HS) : $p \rightarrow q$
 (*Hypothetical Syllogism*) $q \rightarrow r$
 $\therefore p \rightarrow r$

Invalid arguments consist of:

- 1) Membenarkan Konsekuen (MK) (*The fallacies of affirming the consequent*)
 $p \rightarrow q$
 q
 $\therefore p$
- 2) Menyangkal Antiseden (MA) (*The fallacies of denying the antecedent*)

$$p \rightarrow q$$

$$\sim p$$

$$\therefore \sim q$$

In understanding the concept of argument on mathematical logic can be used as a habit of discussion in the group of teachers or can also be used as a form of training that can motivate teachers to be able to familiarize students think logically, systematically and consistently so that later can achieve quality life.

2. Method

Through research ex post facto aims to investigate and reveal the truth whether the conditions that have occurred is due to the behavior that has been suspected before. The use of survey methods along with interviews aims to increase confidence and ensure various allegations that have been previously owned. Through interviews and surveys it is generated that it is true then recognized by all teachers when a person is able to use his logical, systematic, consistent, mind-set of minds, and can be ascertained when a person has attained the happiness of life or feels he has a better quality of life It can be classified that they use the analysis of logical thinking when making decisions. When the daily use of WhatsApp (WA) can not be avoided by everyone as well as teachers, we can then make the most of the group, from 58 members of elementary, junior high, and senior high school teachers, aged 35-45. They are all still reminiscing of the time when they were in elementary school of both pleasant and sad events. So the ability to remember this is proof that the elementary school is a golden period that is difficult to forget. Since elementary school, most of them have dreams as vision and mission of their future life. Only 10% of those teachers get motivated by their elementary teachers, while 90% remember getting motivation from parents and family to find their goals. As respondents these teachers claim to have felt a better life when compared with his friends first. The experience of the interviews made the researcher want to express the importance of training the mindset of students based on the concept of mathematical logic from an early age, so that later can improve the quality of life of their students in the future. Through ex post facto research with survey method shows that not many teachers are able to provide supplies for students who lead to quality life. From the data of respondents 58 active students from the faculty of teacher and education who already served as teachers in elementary, junior high school. A random sample

of those who enrolled the teaching practice course. Through interview questionnaires indicate that they need training to become teachers who are able to familiarize students with their logical, systematic and consistent mindset. Through an interview questionnaire, 93% said it was unthinkable to associate the concept of mathematical logic with the preparation as a provision of quality living for their students. As many as 7% say they've tried to link it, but still doubt whether the way that is done is correct or not. It can be concluded that they need training, motivation to become teachers who are able to use the concept of mathematical logic as the basis of logical mindset in order to familiarize the students to have a quality of life expectancy.

3. Result and Discussion

In Mathematics education has been instilled the concept of logical thinking through the concept of implications and biimplications. This concept can form a logical mindset that can be utilized when making decisions to avoid wrong decisions. It would be nice if the teachers and parents who have elementary school children are able to utilize the golden time to equip and instill logical thinking. A logical mindset for elementary school students can be started through a simple example like the teacher noticing that there are sleepy students when listening to teacher explanations? If a student is approached, asked what time of the night sleep, why sleep late?, from student answers can be used as an example of a bad result and please remember to not be repeated again so tomorrow can lead a better quality of life. When having a sick child, parents should immediately ask "you ate anything, drink anything?", The child is invited to recall what has been done so that cause illness. In this way familiarized it will be patterned dipikiran child to be more careful in choosing food and drink so as not to hurt anymore. The problematic life is closely related to the problem or math problem, so it is wrong if the teacher starts the lesson does not use examples of stories related to the life of his students.

Characteristics in the mathematics lesson that has an object of study that is increasingly abstract in accordance with the level of education that makes students have difficulty in learning. This is because mathematics is not just a matter of counting but how to choose, to use information accurately, accurately, and efficiently in solving problems, and how to formulate and interpret solutions that are made to be understood by yourself as well as others. This

is in line with Johnsons in Kleden (2013) which suggests that solving math problems is a complex mental process that requires visualization, imagination, analysis, abstraction, and the unification of ideas [5]. So the teacher needs to understand that the material presented will be more easily accepted if the student begins with the story and not the story about the story is placed or delivered at the end when conveying the concept.

It is reinforced in NCTM (2000) that communication makes mathematical thinking observable and encourages students to reflect on their own understanding of mathematics and the understanding of others [6]. In line with NCTM (2000), in Permendiknas No 22 of (2006) on Mathematics Subject Matter Standard affirmed that the purpose of learning mathematics, among others [7], are (1) problem solving which includes the ability to understand the problem, design mathematical model, complete the model, and interpret the solution obtained; (2) communicating ideas with symbols, tables, diagrams, or other media to clarify circumstances or problems; (3) has an attitude of appreciating the usefulness of mathematics in life, which has a curiosity, attention, and interest in learning mathematics, as well as a tenacious attitude and confidence in problem solving. If until now still found teachers convey the concept of mathematics begins with *cotuh* about the numbers, then this is the cause of the story it looks very difficult. Many elementary students still ask the teacher when they are going to work on the story, "what's the number 1 pack plus what is reduced?" And often makes the teacher annoyed or angry. This phenomenon must be followed up immediately by self-reflection and immediately make improvements to the delivery of material, from proper planning, implementation, reflection, accurate improvement.

Furthermore in the Education Unit Level Curriculum it is also said that students as learners are expected and required to have (1) Problem solving skills in mathematics, as well as other subjects, as well as real life related issues; (2) Ability to use mathematics as a means of communication; And (3) The ability to use mathematics as a viable means of reasoning in every situation, such as critical thinking, logical and systematic. Observing the purpose of mathematics education and NCTM standard above can be said that the ability of mathematical communication is needed in learning mathematics. By having this ability, students will appropriately explore the mathematical ideas and strategies they use to solve a problem in the form

of language both orally and in writing. Through good communication, students are able to convince themselves and others about their thoughts and have confidence in learning math. This communication capability should be based on logic concepts such as implications and biimplications, in order to avoid mistakes in word selection decisions as well as decision-making.

Quality of life

Professor emeritus field of Clinical Psychology Faculty of Psychology (Fapsi) Unpad, Prof. Dr. H. Soetardjo A. Wiramihardja in Maulana (2013) reveals, mental health (mental health) associated with the condition of the soul and healthy behavior. Mental health is also associated with mental hygiene that supports the body to be healthy (healthy life) [8]. If the condition has been owned by someone, it will create a good quality of life (quality of life). Quality of life is how a person's quality when viewed from the interaction with life around him. Mental health is an optimal condition that concerns the intellectual, emotional, and social side without any disturbance. Optimal conditions occur when the presence of a person does not interfere with his environment, especially in the social environment. If a person has great intellectual power, but is used to do actions that destroy the environment for his pleasure, it can not be said to be healthy. In addition, many people are clever but they are not ready to use intelegensinya, it also can be said is not healthy. For example, a student is clever but apparently likes to interfere with friends, like to quarrel with friends, it can also be said is not healthy. Then, how to characterize people who have good mental health? Prof. Soetardjo explains that people who have good mental health is able to maintain self, temperament, ready-made intelligence, behave with social considerations, have a happy tendency, and able to adjust according to their environment. Adjusting here means that one is able to actively adapt to its environment according to plan, without any compulsion to conform. How to get students to have provision of Quality of life and mental health early on, it is definitely needed more qualified teachers in mental and life. If mental health has been maintained, then automatically the quality of life will be good. This is because, between mental health and quality of life is part that can not be separated. Mental health will improve the quality of life and quality of life will improve mental health. To improve the quality of life, Prof. Soetardjo suggested that humans should be

able to interact based on 3 natural, including the natural objects that utilize the nature of things on the basis of mutual care. The social realm, which is capable of building intersubjective relationships with other human beings on the basis of mutual love, and able to build noogenik interaction (culture, ideas, and values). This means that every individual who wants a better life and quality needed interaction skills with everything that is around us. Do not let when have ideas, do not consider the surrounding culture, do not have a positive value for the environment. The last realm is transcendent nature, that is to believe and grateful that all the good that exists is the rachmat and the grace of Allah SWT, so that a better quality of life can be easily achieved.

4. Conclusion and Discussion

Elementary School Teachers and parents who have children are still in elementary school should recognize the important time in this golden age. Embed in elementary students logical, systematic, and consistent mindset through a real example of mathematics education as a provision to improve the quality of life later if grown. Their memories are so strong that they need to be exemplary every day and every time. Contribution of special mathematics education to the logic of implications and biology can be the basis for thinking, arguing, and making correct decisions. Mathematical ability is the basis of the ability to communicate with surrounding environment full of confidence.

Teachers need continuously in training, as this era of life also develops. Teachers also need exemplars to be able to familiarize their students using a critical, systematic and consistent mindset. Do not expect students to live quality if the teacher has not had a healthy mental and a quality life yet.

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