

Developing Multiple Intelligences on Instruction to Build Four Education Platforms of Vocational Schools Students in Kendari

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Abstract—This research aims at developing multiple intelligences as one of learning strategies to build up four qualified education platforms for vocational schools' students in Kendari. Multiple intelligence is a concept which enhances all the students' potentials to develop the four education platforms in learning, in order that it can result something meaningful in their lives, such as learning to know, to do, to live together, and to be which is manifested on science subject with the energy changes as the lesson topic. The research method is experimental design which employs pre-test and post-test with control group. The sampling is undertaken by using random sampling. In this respect, XI B becomes the experiment class while XI C as a control group. The result of this study indicates that the development of multiple intelligences on science subject with energy change lesson on vocational students in Kendari can generate the four education platforms. The statistical calculation also devotes that experimental class gains higher score than control class.

Index Terms— multiple intelligences, four education platforms, Vocational Schools

1 INTRODUCTION

The implementation of learning strategy is often not based on comprehensive and deep analysis about students' characteristics, learning objectives, material and learning atmosphere. Teacher-direct instruction is one of the students' favours because it is easily applicable, effective, appropriate with the majority of students' needs (White, et al, 2014). In general, the students of course have different learning style and tendency from others. This variety should be considered differently included the decision to determine appropriate learning strategy to develop students' intelligence (Pertina, 2014).

The variety of intelligence is considerably concerned by Gardner (1999) in the theory of multiple intelligences. This theory has led to the severe changes in education field because it counterattacks the former theory which stated that intelligences quotient (IQ) is solely the core of intelligences. According to Gardner (1999) intelligences which are derived from IQ concept are limited to three kinds of intelligences, such as linguistic-verbal intelligence, logic-maths intelligence, and visual-spatial intelligence. Thus other type of intelligences like naturalistic, music, interpersonal, intrapersonal, and kinaesthetic has not been covered by IQ concept. This situation leads to the existence of multiple intelligences developed by Gardner which has influenced many learning practices in this universe (Amstrong, 2009).

Research shows that cognitive intelligence (IQ) affects actual performance of someone as much as one percent. Emotional intelligence affects it 27% while other 72% is influenced by other factors (Dawson, P. & Guare, R., 1998,2-3). Stein and Book point out that IQ can be employed to estimate the success rate of certain job as much as one to twenty percent (mostly six percent), while EQ has role as much as 27-45%, and directly has a role in the success of certain job depending

on what kind of job it is (Stein and Book, 2000:34)

The human intelligences should be considered based on three main components. The first is the ability to direct thought and action. The second component is the ability to change the direction of thought and action. Then the third is the ability to criticize own thoughts and actions (Binet, 2014). Analyzing human's ability cannot be committed by classifying them based on their tendency, changes, and the correction of action and thought, but based on their action when implementing their thoughts and symbols as effective as possible (abstract ability). According to Thorndike cited in Musfiroh (2008), abstract ability refers to the ability to do something using their kinaesthetic ability (motored ability) and ability to adapt with the new environment (social ability).

Howard Gardner (1999) highly attempted to undertake any research involving different experts from different fields in order to create the theory of multiple intelligences which in turn published in some books entitled 'frames of mind' (1983) and 'Intelligences Reframed' (1999). Although at first Gardner found out seven kinds of multiple intelligences, as like (1) verbal-linguistic intelligence, (2) logical mathematics, (3) visual/spatial, (4) music/rhythmic, (5) body/ kinaesthetic, (6) interpersonal, (7) intrapersonal, he is still an open-minded person who said whether there are additional intelligences by considering the possibility of other intelligences by doing in-depth analysis, for example naturalist intelligence, spiritual intelligence, and existential intelligence. If the depth analysis about Gardner's ideas (1983) who divides seven intelligences on his book, frames of mind and adds three intelligences on his latter book, intelligence reframed is done, the real multiple intelligences consist of ten intelligence. However, Gardner (1999) argues that there is overlap between existential and spiritual intelligence. Therefore, the implementation of multi-

ple intelligences is only made up eight parts which does not include spiritual and existential intelligence (Amstrong, 2009). Nonetheless, some of authors and researchers, as Yosi (2009), Bowles (2008), McKenzie (2005), and Buzan (2002), have included spiritual intelligence as a part of multiple intelligences.

Based on this concept, the researcher (2016) tends to use multiple intelligences which consist of nine types included spiritual and existential intelligence. This is done in order that the researcher can further analyze spiritual intelligences in supporting the national education objectives. Unfortunately, all of the above intelligences have not been integrated fully in the instruction and learning, especially those related to variety of learning strategies to develop students' intelligences during teaching and learning process.

Vernon A. Magnesen (Munif Chatib, 2011:137) explains that if someone learns ten percent from what he/she reads, twenty percent from what she/he listens to, thirty percent from what she/he sees, fifty percent from what she/he listens and sees, seventy percent from what she/he says, and ninety percent from what she/he says and does. In this respect, a person can absorb any information when she/he does or practice what she/he has learned.

Based on Yaumi's study (2013) about the instruction based on multiple intelligences which in turn developed to be a multiple-intelligences-based instruction book, it points out that there are four types of learning strategies based on schools' condition in Indonesia, for example brainstorming, telling stories, writing journal, and reading biography. These learning activities are considered as the representative of receptive and productive skills of each student.

In this present research, the instruction based on multiple intelligences of students is derived from the concept proposed by UNESCO that education is like a building which is strengthened by four platforms as like learning to know, learning to do, learning to live together, learning to be. These platforms are one of factors affecting the success of the students; of course it is related to multiple intelligences concept developed by Gardner.

2 LITERATURE REVIEW

The Concept of Multiple Intelligences

UNESCO (The International Commission on Education for the Twenty-first Century) considers the changes of education paradigm is very significant as an instrument to create and develop the real human (Jaques Delors, et al, 1996).

Based on that, the four education platforms of UNESCO can be classified as follows: learning to get knowledge and continue to learn (learning to know), learning to have the basic competence related to different situation and team work (learning to do), learning to actualize ourselves as individual who has own balance and responsibility (learning to be), and learning to appreciate and implement any condition of dependence, diversity, understanding, and peace among nation (learning to live together).

a. Learning to know

Learning to know is part of learning process which allows

the students to not only obtain knowledge but also master the techniques to get the knowledge itself. This platform is potential to create young generation with high intellectual and academic ability. Implicitly, learning to know means life long learning. The life-long learning concept is actually derived from the idea that education process can occur in all phases of one life which can be done inside or outside schools. In relation to life-long learning, the role of human is to educate and develop our selves appropriately which is the human's nature.

Jacques Delors (1996), as the head of composition commission of Learning the Treasure Within, argues that there are two benefits of knowledge; which are knowledge as mean and as a result/ end. As a mean, knowledge is used to reach any aims, like as understand the environment, life well based on the situation, develop working skills, and communicate to each other. As a result or an end, knowledge is their basic to understand, know and find out things. Knowledge is dynamic; every time there will always be new knowledge. Therefore, learning to know should always be done and improved to know much.

b. Learning to do

The target of this platform is the young generation working ability. The students will be taught how to do something in a concrete situation which is not limited to the mastery of mechanic skills but also skills in communication, team work, management and prevention of problems as well. By the implementation of this platform, it is possible to create young generation who are intelligent in working and have innovation. Education leads students to not only know something but also to do in order to create meaningful things in life. The goals of this platform are the working ability and enter the economy industry.

c. Learning to live together

In this complicated era, any conflicts can be happened as like nationalist, race, and religion conflicts. The main cause is derived from the inability of some people or groups to accept the diversity. Accordingly, learning to live together becomes the important platform to teach the important values in peace. Team working can encourage students' motivation because they will be able to actualize themselves, when the motivation is triggered internally, it will be a powerful power to enhance the learning objectives.

d. Learning to be

The meaning of this platform is the end of the previous three platforms (Learning to know, learning to do, and learning to live together). By implementing this platform, the students are about to be the independent and great people. The first three platforms aims at creating the new generation who can look for information and find out the problems, and be able to work in team, tolerate each other, and accept the diversity. If these three platforms work out, the students' confidence will be good as well.

3 RESEARCH METHOD

The population of this research is all vocational schools' students who registered 2014/2015 academic year. Sampling technique is used cluster random sampling which consists of experimental class will be SMKXI-B and control class is SMK XI-C. This research is a quasi-experimental design. The independent variable is the multiple intelligences and the dependent one is the four education platforms. The design of this study is pre-test post-test with control group design.

Learning to know aspect is related to the energy change concept which is measured by pre-test and post-test. Understanding basic science and obtaining any information are the important ability for the continuous study in the future (ChanLin, 2008: 592). Learning in classroom apparently determines that if 75% of all students obtain standard score, 75 of 100 points, the learning process is seen successful in science classroom.

The next aspect is learning to do, learning to live together which is related to students' activities in teaching and learning process. Learning to be aspect can be assessed based on the activity's report on media creation. In independent learning system, the students are independent (individual or group) to determine 1) learning objectives; 2) what you learn and where you get the information; 3) how to obtain (learning strategies); 4) when and how the success is rated (Shindunata, 2005: 96). The score then will be analyzed using statistical tools to test whether the students pass or fail, to test the gain score, and percentage descriptive analysis.

4 RESULT AND DISCUSSION

The results of testing in experimental and control class in building the four education platforms can be seen on table 1 to 5, as follows:

Table 1. The result of two averages

Learning aspects	T_{count}	t_{table}	Criteria
learning to know	3,81	2,03	Ho is rejected
learning to do	3,47	2,03	Ho is rejected
learning to live together	11,05	2,03	Ho is rejected
learning to be	6,98	2,03	Ho is rejected

Table 2. The result of minimum standard of individual score

Learning aspects	T_{count}		Criteria	
	Experimental class	Control class	Experimental class	Control class
learning to know	5,52	0,15	Pass	Fail
learning to do	5,76	-0,80	Pass	Fail
learning to live together	4,25	2,14	Pass	Pass
learning to be	12,05	11,47	Pass	Pass

Table 3. The result of classical score of minimum standard

Learning aspects	Percentage(%)		Criteria	
	Experimental class	Control class	Experimental class	Control class
learning to know	77,15	58,81	Pass	Fail
learning to do	81,00	50,00	Pass	Fail
learning to live together	91,45	82,36	Pass	Pass
learning to be	99,8	99,05	Pass	Pass

Table 4. The result of gain score testing between experiment and control class

Class	Pre-Test	Experiment and control class	Post-Test	Criteria
Eksperimen (XI-B)	53,20	75,24	50,24	Moderate
Kontrol (XI-C)	50,45	70,15	35,26	Moderate

Table 5. Descriptive analysis of observation data

Class	Learning to do	Learning to be	Learning to live together
Eksperimen (XI-B)	78%	88%	82%
Kontrol (XI-C)	68%	87%	78%

In the averages test, it is said that $t_{count} > t_{table}$ for each learning aspect which means that the average score for experimental class is higher than in control class. In minimum score standard test, the students in experimental class are success to pass each learning aspect because $t_{count} > t_{table}$. In control class, the aspects of 'learning to know' and 'learning to do' have not showed good result because $t_{count} < t_{table}$. For aspects such as 'learning to live together' and 'learning to be', the result is good. In addition, in classical score test, experimental class has shown good result for every learning aspect, while control class has not especially for some learning aspects like 'learning to know' and 'learning to do'.

Gain score test indicates that the improvement of pre-test and post-test result in experimental and control class is in moderate level. However, the improvement of pre-test to post-test in experimental class is higher than in control class. The descriptive analysis of observation data percentage shows that the data percentage of 'learning to do', learning to be', and 'learning to live together' of experimental class is higher than control class. The students' post-test score in experimental class is higher than control class. In experimental class, the students do not only memorize the lesson, but they make it real by creating media. The students' knowledge is more meaningful that way.

In control class, some students tend to memorize the lesson from the first meeting, because not all students are active in the discussion. In this case, we can see that the students' score in experimental class is higher because this class applied multiple intelligences in teaching process while control class still implemented conventional one.

It is in line with the activities done in experimental class such as making media, group discussion, and group presentation seem more interesting than the activities in control class, because the experimental students are able to create a media of the energy changes which might enhance the students' motivation while doing the group discussion and presenting the media. Every member of group in experimental class attempted to participate actively and interact with their friends. While

in control class, the students' interaction and participation in discussion section is still influenced by their cognitive ability. The male students are more active than females. This study result is different from other studies by Rosidatul Munawaroh et al, (2012) who point out that the students' interaction in group discussion is affected by their cognitive ability and gender, where females tend to be more active in doing assignment.

In experiment class, the steps or class procedure are determined by the students while those in control class followed the worksheet given. As a result, independent study to write the activity journal is not that different. However, in discussion section, those who are in experimental class have the complete one.

Based on the result analysis stated previously, it indicates that the development of multiple intelligences in science subject can build up the four education platforms in vocational schools of Kendari. It also indicates the better result in experimental class than in control class.

5 CONCLUSION

The result indicates that the development of multiple intelligences to build up four education platforms in vocational schools' instruction with the topic is the energy changes shows better result in experimental class. The gain score test shows that the improvement of pre-test to post-test score in experimental class is higher than in control class. The average score test for each learning aspect; experimental class is higher than control class as well. Finally, when it comes to passing grade standard, experimental class has been success because t count is bigger than t table.

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