# CHARACTER EDUCATION MODEL IN MATHEMATICS AND NATURAL SCIENCES LEARNING AT MUHAMMADIYAH JUNIOR HIGH SCHOOL

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**ABSTRACT:** *This study aims to describe the practicality and effectiveness of character education models integrated in the learning of Mathematics and Natural Sciences is based on broad-scale trials were conducted at Muhammadiyah Junior High School of Malang City. Type of research is class action research-based lesson study with full reference to the Susilo (2009). This study was conducted in two cycles, refers to the Spiral Model of Kemmis & Taggart (1988) and Lesson Study which refers to Lewis (2002). The results of an analysis of the feasibility study observation sheet and teacher responses indicate that the model developed is included in the category of practical on the cycle I and is very practical in the cycle II. This model is practical for several reasons, namely 1) the development of models adopt a pattern that has been set by the government, was developed based on the conditions and be flexible, 2) the model allows teachers to implement and adapt to the conditions of the school or class being taught, 3) model has been developed passed the stage of planning, implementation, and evaluation involving teachers through the process of discussion and trial and supported by the feel of lesson study. The effectiveness of the model is included in the category of less or low in Cycle I and quite good in Cycle II. The values of the characters are already being integrated in the learning of Mathematics and Natural Sciences. Although the values of the characters that appear only include medium category, but gently push the teacher models for students' attention to aspects of the character.*

**KEYWORDS**: Character, Natural Sciences, Mathematics, Muhammadiyah, Learning

## INTRODUCTION

Muhammadiyah is a religious organization founded by Ahmad Dahlan on November 18th, 1912. According to Khalimi (2010) Muhammadiyah is Islamic movement which is carrying out propaganda and "tajdid" for the realization of the Islamic community in truth. As missionary movement, Muhammadiyah invites mankind to embrace Islam (*da'wah ila al-Khair*), told the good (*al-amr bi al-ma'ruf*), and avoid what is evil (*al-nahy 'an al-munkar*), so that human lives saved, happy, and prosperous in the world and the hereafter. Muhammadiyah is an Islamic movement that bases its entire social religious activities (*worship aural*) and the vision of life in the Koran and the Sunnah of the Prophet Muhammad as narrated in the *saheeh hadith*. Muhammadiyah also follows the struggle of the Prophet Muhammad in Islam preach and promote social welfare.

Muhammadiyah believe that Islam as a religion is in accordance with modern people's lives or does not conflict with modernism. This is because it has laid down principles of teaching in accordance with the development of mankind mindset (Khalimi, 2010). Therefore, Muhammadiyah synonymous with reform measures undertaken, one of which is the pioneer of modern education that combines religious studies and general. The idea was pioneered

education Ahmad Dahlan, an update for being able to integrate aspects of the faith and progress, so that the resulting figure generation of educated Muslims who are able to live in the modern era without a split personality. Modern Islamic educational institutions even become the main feature of birth and development of Muhammadiyah, which distinguishes it from the agency boarding school at the time. Modern Islamic education was later adopted by the community and become Muslim educational institutions such as now (Kuntowijoyo, 1998; Jinan, 2011).

Muhammadiyah education spread all over Indonesia (Haykal, 2000; Nurmandi, 2010), including in Malang, East Java, has stood Muhammadiyah junior high schools. Since the days of Ahmad Dahlan, Muhammadiyah schools was held in a modern (classical system, do not use the system as implemented by the Salaf/traditional and wear boarding school curriculum). Muhammadiyah fully implement the goverment curriculum and add it to the curriculum *AI Islam, Muhammadiyah and Arabic* which extends approximately 5 to 9 hours of lessons per week (Subhan, 2005).

The spirit underlying the important role of Muhammadiyah junior high schools in Malang is that education plays an important role in the life and progress of mankind. According to Law Number 20 of 2003 on National Education System, education is a conscious and deliberate effort to create an atmosphere of learning and the learning process so that students actively develop the potential for him to have the spiritual strength of religious, self-control, personality, intelligence, noble character, and skills needed themselves, society, nation and state. Once the importance of education in life, therefore education is referred to as a lifelong process and the formation of self-realization of human beings as a whole. Education is also developing all the potential in order to meet all commitments as individual humans, as social beings and as creatures of God. Education is realized through the efforts or activities undertaken deliberately, regularly and plan with the intent to modify or develop a desired behavior.

As a private educational institution, Muhammadiyah junior high schools are considered school level/second class, where the students come from families with lower economic conditions, orphans, troubled families, and students with relatively low cognitive abilities. This condition contrasts with the public schools, where most students come from families with middle to upper economic conditions and students have relatively higher cognitive abilities. Students at Muhammadiyah junior high schools have typical attitudes and behaviors (characters) are different and require extra handling of the teacher and school.

The problem this student's character is an issue in general of the Indonesian nation. Chairman of Muhammadiyah, Prof. Dr. Din M. Syamsuddin, highlights that the culture there is also damage to the plains of national character, as indicated by the low human development index, and the degree of competitiveness of the nation. The process of national education has not succeeded in forming a strong national character ((Shamsuddin, 2013). Though the inputs were less good and should educate students with poor character anyway, but Muhammadiyah junior high schools persist. According to Subhan (2005) because Muhamamdiyah schools graduates are expected to be Muslims who believe, fear Allah, intelligent, skilled, and noble-minded and useful for homeland nationality, nation, and religion (of noble character). Given the importance of the problems the student's character and the importance of Muhammadiyah schools it is essential to the development of a model of character education in junior high schools Muhammadiyah. So far, there are 3 models of character education in schools, namely planting character through school culture, cultivation of character through

extracurricular activities, and character cultivation through learning activities. Special efforts planting character through learning activities has not happened as expected due to the weak understanding of the teachers in implementing it. Yet according to the Directorate of Junior High School of Indonesia (2011) should be pursued innovation one of which is a character education character education is integrated into all subjects (learning). Integration may include loading the values into the substance in all subjects and activities that facilitate teaching and learning practiced values in each learning activity inside and outside the classroom in all subjects.

Implementation of character education integrated in existing subjects become urgent to do than adding character education subjects as new subjects (Sahlan & Prastyo, 2012). The integration of character education on subjects other than religion and civic education should develop activities that have an impact accompaniment (nurturant effects) positive character development of students (Indonesia Curriculum Center, 2010). Character education is not just to teach what is right and what is wrong. Character education inculcate the habit of it which is good so that students come to understand (*cognitive*) about what is right and wrong, able to feel (*affective*) good values and used to do (*psychomotor*) (Usmeldi, 2013). In other words, character education must involve a good knowledge (*moral knowing*), feeling good (*moral feeling*), and behavior (*moral action*). Character education emphasizes the constant habit done (Lickona, 1992).

The learning process includes elements of overall cognitive, affective and psychomotor. If the learning process is not running simultaneously there will be a split personality (*self apart*) on each student. Symptoms split personality is evident in the way the world of education, not least education Mathematics and Natural Sciences (Wahid, 2007). According Khusniati (2012) takes an integrated character education in all subjects, one of which the subjects of Mathematics and Natural Sciences. This means that the inclusion of the values of character education in the classroom, both material and process of learning that takes place, so expect the values that will be embedded with both the students, which will eventually form into a character.

Departing from the above description it is necessary to the development of the learning model of character education in the subjects of Mathematics and Natural Sciences at Muhammadiyah Junior High School of Malang. Based on a variety of backgrounds in the above description, the purpose of this research is to develop a learning model of character education in the subjects of Mathematics and Natural Sciences at Muhammadiyah Junior High School of Malang and simultaneously see the effectiveness of the implementation of the model in improving the character of the student. In limited testing phase in Muhammadiyah 1 Junior High School of Malang found a significant difference between the mean score of the experimental group and the control group therefore concluded that the Model Integrated Character Education Mathematics and Science Study In Junior Division developed through this research deserves more widely tested in Muhammadiyah Junior High School of Malang City before disseminated at Muhammadiyah 8 Junior High School of Batu City and Muhammadiyah 2 Junior High School of Batu City. This article aims to describe the results of large scale model tests in Muhammadiyah Junior High School of Malang City. Model lessons learned will be very useful to determine the measures or policies related to character education in the form of step improvements or quality improvement.

## LITERATURE REVIEW

### The Importance of Character Education

According Khusniati (2012) the term of the characters presented by Lickona (1992) by using the concept of good character. The concept of good character popularized Lickona with reference to the concepts put forward by Aristotle as follows "... *the life of right conduct-right conduct in relation to other persons and in relation to oneself*". The concept of good character popularized Lickona with reference to the concepts put forward by Aristotle as follows "... *the life of right conduct-right conduct in relation to other persons and in relation to oneself*".

Kinds of values that will be built in self-learners cover a variety of things. According to the Ministry of National Character Education Team (2010) has identified 80 items that are grouped into five grades, namely the values of human behavior towards God, the values of human behavior toward self, the values of human behavior towards each other, the values of human behavior on the environment and national values. Davies in Suyatno (2010) says there are 52 sentences that can be used to develop the character of children, six of them for example: (1) how I look is not as important as how I act; (2) I treat others the way I want them to treat me; (3) I am a good sport, I follow the rules, take turns and play fair; (4) it is okay to laugh at funny things, but not to laugh at others; (5) I do not gossip, if I can not say anything helpful, I do not say anything at all; (6) when I am sad, I help myself feel better by thinking of things that are good in my life.

Birth of character education is an attempt to revive the spiritual ideal pedagogy that had lost hit by a wave of positivism that was pioneered by the French philosopher Auguste Comte. Character education will provide social assistance so that individuals can grow in freedom to live life with other people in the world (Koesoema, 2007). Lickona (1992) explains some of the reasons for the need of character education, including: (1) The number of young people hurt each other because of the lack of awareness on moral values, (2) Provide moral values in the younger generation is one of the most important functions of civilization, (3) the role of the school as an educator character becomes increasingly important when many children get little moral teaching from parents, community, or religious institutions, (4) There are some moral values are still universally accepted as caring, trust, respect , and responsibility, (5) Democracy has a special need for moral education, (6) there is no thing as value-free education. School teaches the value of free education, (7) Commitment to character education is important when we want and continue to be a good teacher, and (8) Effective character education makes schools more civilized, caring society, and refers to increased academic performance.

Character education is a plus character education, namely that involves aspects of cognitive, feeling, and action. According to Lickona *et al*., (2007) without these 3 aspects, the character education will not be effective, and its implementation must be done in a systematic and sustainable. With character education, a child will be emotionally intelligent. Provision of emotional intelligence is important in preparing children for the future, because with it one can succeed in the face of all kinds of challenges.

Elkind & Sweet (2004) initiated the view that character education is the deliberate effort to help people understand, care about, and act on the values of ethics/morals. Character education teaches habits of thinking and acting that help people live and work together as a family, friends, neighbors, community, and nation. This view according Suyatno (2010) illustrates that

the process of education in formal, non-formal and informal should teach students or children to care about and help each other with great intimacy without discrimination because based with moral values and friendship. Success in organizing and instill the values of life through character education can also be affected by the approach used in conveying. According Suparno, *et al.* (2002) there are 4 models of character education delivery approaches.

First, the separate subjects model. In this approach the model of character education is regarded as a separate subject. Therefore character educations were equal and treated the same as other subjects or areas of study. In this case the character education of teachers should prepare and develop the curriculum, developing a syllabus, making Design Learning Process, teaching methodology, and evaluation of learning. Consequently character education should be drafted in a structured timetable. The advantages of this approach include the submitted materials become more planned mature/focused, material that has delivered more measured. While the weakness of this approach is highly dependent on the demands of the curriculum, then planting these values as if only the responsibility of one teacher per se, as well as the impact of character education that emerged just touches the cognitive aspects, do not touch the internalization of such values.

Secondly, the model is integrated in all fields of study. The second approach in delivering character education is delivered in an integrated way in any field of study, and therefore the responsibility of all teachers (Washington, *et al*., 2008).

Third, the outside of teaching model. The values can also be embedded character education outside formal learning activities. This approach focuses processing and cultivation of value through an activity to be discussed and then discussed the values of life.

Fourth, the combined model. Combined model is to combine integrated model and the model outside lessons together. This model can be implemented in cooperation with a team either by the teacher or in cooperation with outside of school. The advantages of this model are all teachers involved, in addition teachers can learn from outsiders to develop themselves and the students. Students receive information about values as well as reinforced by experience through activities planned well.

Generally, the material on character education described by Berkowitz & Brier (2007) who reported that a very wide character education materials. From the research results described that there are at least 25 variables that can be used as educational material character. However, of the 25 variables are the most commonly reported and there were only 10 significant, namely: (1) sexual behavior, (2) Knowledge of the character (Character knowledge), (3) Understanding of social morality; (4) problem-solving skills, (5) emotional competence, (6) Relationship with others (Relationships), (7) Feelings keterikan with school (Attachment to school), (8) academic achievement, (9) Competence to communicate, and (10) the attitude of the teachers (Attitudes toward                                                                                              teachers).

According to character education is done in order to achieve the national education goals for the development of human potential students to become "whole". Character education in formal education took place at educational institutions ranging from kindergarten, elementary school, junior high school, senior high school, dan vocational school, and university through learning, and extracurricular activities kokurikuler, creating a culture of education units, and habituation.

The target of character education in the formal education were students, teachers and education personnel (Directorate of Workforce, 2010; Irawati, 2013).

In line with the above opinion, according Koesoema (2010) to streamline and implement character education as a whole should include three base design in programming. 1. Design of class-based character education. This design is based on the relation of teachers as educators and students as learners in the classroom. 2. Design of character education based school culture. This design is trying to build a school culture that is capable of forming the character of the students with the help of school social institutions so that certain values are formed and terbatinkan in students. 3. Design of community-based character education. In educating, school communities are not struggling alone. People outside educational institutions, such as families, the general public, and the state, also has a moral responsibility to integrate the formation of character in the context of their lives.

**Character Education in Mathematics and Natural Sciences**
One of the learning objectives of Mathematics and Natural Sciences is to provide reinforcement or provide supplies to students about the scientific attitude. Learning Mathematics and Natural Sciences contains four elements, namely attitudes, processes, products and applications so that students are expected to not only have the knowledge, but also master the scientific process and can apply the knowledge gained (Unijianto, 2009).

According Muslich (2008) scientific attitude is an attitude that must be present in a scientist or academic when faced with scientific issues. The scientific attitude needs to use. The type of scientific attitudes in question are 1) Curious Attitude. This curious attitude seen in the habit of asking about various issues related to the field of study. 2) A critical attitude. A critical attitude is seen in the habit of looking for as much information as possible related to the field of study for excess-than-appeal shortcomings, suitability least, the truth of whether or not, and so on. 3) Open attitude. This open attitude seen in the habit of going to listen to opinions, arguments, criticism, and information of others, though in the end the opinion, argument, criticism, and testimony of others is not acceptable because they do not agree or do not fit. 4) Attitude objective. Objective attitude is seen in the habit of stating what it is, with no personal feelings. 5) Attitude willing to respect other people's work. Respect for other people's work is seen in the habit of mentioning the source clearly in case statements or opinions expressed are derived from the statements or opinions of others. 6) Attitude dare defend the truth. This attitude descry the kink defend the facts and findings of the field or for whose benefit the development of contradictory or incompatible with existing theory or proposition. 7) The attitude of reaching out to the front. This attitude is evidenced by always trying to prove the hypothesis that the formulation for the development of the field of science.

Scientific attitude is not only linked to scientific thinking, but also emotional (affective) and behavioral (psychomotor). Scientific attitude is, among others, (Saukah, 2000; Wiyono, 2009): (1) The desire of curiosity and continuous learning, (2) a sharp power analysis, (3) be honest and open, (4) Critical to the dissenting opinion (5) high responsibility, (6) Free from prejudice, and (7) Appreciate the values, norms, rules and scientific traditions.

The learning of Mathematics and Natural Sciences also need to provide reinforcement to the character of human resources (HR). Character traits include a strong human resources (1) religious, that have a life attitude and personality pious, honest, trustworthy, generous, helping

each other, and tolerant; (2) moderate, which have a life that is not a radical attitude and personality are reflected in the mid between the individual and social, material and spiritual oriented and able to live and cooperation in diversity; (3) intelligent, ie has the attitude and personality of a rational life, love science, open, and forward-thinking; and (4) independent, ie has the attitude and personality of an independent life, high discipline, thrift, respect time, resilient, entrepreneurial, hard work, and have a love higher nationalities without losing orientation universal human values and inter-civilization relations of nations (PP Muhammadiyah, 2009).

According to Dedy (2010) Mathematics and Natural Sciences is a boost to the element of the pattern and way of thinking through the order valid, true, reliable, verify, hypothesis, theory, law, principle, and Axioma, postulate and proof. Language and reasoning works push to develop mutual reciprocal of Mathematics and Natural Sciences as a basis for guiding human thought find things original. In accordance with the development of life ranging from Mathematics and Natural Sciences - Newton up to the life style of modern humans apparently have sensed a new challenge, as it is amazing from the beginning up to the Mathematics and Natural Sciences is the latest. Education Mathematics and Natural Sciences plays an important role in eliminating duping and can lead to a better life.

Soelardjo in Dedy (2010) revealed that the Mathematics and Natural Sciences has always been associated with the real facts that occurred from a natural process or that are specifically designed. Mathematics and Natural Sciences as a discipline is essentially significant in the development of logical thinking ability, systematically and creatively so that the Mathematics and Natural Sciences are often able to deliver the individual to realize that the absolute truth is God's truth while scientific truth is intrinsically tentative. The more actives and the more distant the scientists to study the more open to finding God. Therefore lucky scientists in the field of Mathematics and Natural Sciences as it has great potential and opportunity to live a morally based religion that life is maintained.

Wasono in Dedy (2010) argued about the relationship between Mathematics and Natural Sciences and character development of the nation. Someone who learn to explore Mathematics and Natural Sciences and doing research will be educated to get the basic character of the researchers in the form of conscientious, honest, have integrity, visionary, open and objective to the truth, cooperative spirit toward others and learners. The fact that the case is the tendency of the public outside the cultural influx of Mathematics and Natural Sciences such as dishonesty, plagiarism or lack of integrity for the sake of momentary examined. Hence the need for character development program consisting of seven main cultivation include honesty, responsibility, visionary, discipline, cooperation, fair and caring.

Learning Mathematics and Natural Sciences clearly have values very close to the character formation of the students. When learning of Mathematics and Natural Sciences with the values as mentioned above can be implemented, the quality of education of Mathematics and Natural Sciences will be better as a whole and can form a good graduate anyway. However, according to Juniarso (2010) character education in the subjects of Mathematics and Natural Sciences has been the same with other subjects, rarely or even not load character education in learning. Mathematics and Natural Sciences regarded as a lesson about the use of the brain alone. Somantri (2008) even asserted Mathematics and Natural Sciences at the school still focuses on rote learning and development consequently limited.

# RESEARCH METHOD

## Types and Stages of Research

Type of research is class action research-based lesson study with full reference to the Susilo (2009). This study was conducted in two cycles, refers to the Spiral Model of Kemmis & Taggart (1988) which consists of four phases namely plan, act, observe, and reflect. Lesson Study refers to Lewis (2002) that meets the 3 phases of Plan, Do, and See. This study is the second year, with the aim of seeing the practicality and effectiveness of an integrated learning model character in the subjects of Mathematics and Natural Sciences which has been developed in the first year. Subject test at this stage is students and teachers of Muhammadiyah 1 Junior High School of Malang, Muhammadiyah 2 Junior High School of Malang, 'Aisyiyah Muhammadiyah 3 Junior High School of Malang, Muhammadiyah 4 Junior High School of Malang, and SMP Muhammadiyah 6 Junior High School of Malang. Furthermore, the results of these trials evaluated and refined/revised. Result after trial refinement broader disseminated in Muhammadiyah 8 Junior High School of Batu City and Muhammadiyah 2 Junior High School of Batu City that the resulting models can be used. The results were then evaluated for later dissemination produce the Final Model Character Education Integrated in Mathematics and Natural Sciences Learning in Junior High School level.

## Research Instrument

The instrument used was a feasibility study observation sheet, questionnaire responses to the teacher learning, and character observation sheet. Variables observed and tested in this study is the feasibility of learning, the teacher's response to learning, and the character appears. The third variable is whether the assessment is geared towards practical model developed and effectively implemented.

## Data Collection Techniques

Data Collection Techniques used to study development of this model is to 1) ask the teacher observer to fill out a feasibility study observation, 2) asking teachers to complete a questionnaire model of teacher response to learning, and 3) through the observation sheet character. Learning executed in shades of lesson study, where teachers were initially asked to present models of devices and models that will be implemented ("plan") to get input from other teachers, then teachers teaching model in class and the teacher is observed by the observer (phase "do"), and after completion of the learning is done reflection or evaluation of the implementation of learning ("see").

## Analysis Techniques

Data regarding the practicality of the developed model was obtained from the observation of adherence to models of learning and teachers' questionnaire responses to the model. The model that has been developed has value practicality or fit for use when at least meet the practical category with an average value of at least or equal to 2.5, whereas for the effectiveness of the model can be seen from the observation of the student's character. The model developed is said to be effective if at the end of the study the average values obtained in accordance with the minimum character predefined categories of teachers. Data were analyzed by descriptive quantitative and qualitative comparing the mean or the information contained in the learning cycle.

## FINDINGS AND DISCUSSION

### Practicality of Character Education Model Integrated in Learning

Practicality of the developed model can be seen from 2 things: 1) feasibility of implementation of the learning model, and 2) the response of teachers to learning. Table 1 is the result of observation of the feasibility study.

**Table 1. The observation of feasibility of learning**

| Junior High Schools | Average Cycle I | Average Cycle II |
|---|---|---|
| Muhammadiyah 1 | 3,25 | 3,70 |
| Muhammadiyah 2 | 3,17 | 3,62 |
| ʻAisyiyah Muhammadiyah 3 | 3,00 | 3,30 |
| Muhammadiyah 4 | 3,30 | 3,52 |
| Muhammadiyah 6 | 3,20 | 3,48 |
| Total Average | 3,18 (practically) | 3,52 (very practically) |

A practical device when said average total score of at least or equal to 2.5 and said to be very practical when the average score equal to or above 3.5 (Jaya *et al*., 2014). Based on Table 1 it is known that the average feasibility of learning for the cycle I is 3.18 or included in the practical category, while the average feasibility of learning for the cycle II is 3.52 or included in the category of very practical. The feasibility of the model developed and implemented in learning can also be judged from the response of the teacher, as shown in Table 2 below.

**Table 2. The respon of teacher to learning**

| Junior High Schools | Average Cycle I | Average Cycle II |
|---|---|---|
| Muhammadiyah 1 | 3,15 | 3,50 |
| Muhammadiyah 2 | 3,15 | 3,55 |
| ʻAisyiyah Muhammadiyah 3 | 3,25 | 3,65 |
| Muhammadiyah 4 | 3,45 | 3,75 |
| Muhammadiyah 6 | 3,25 | 3,60 |
| Total Average | 3,25 (practically) | 3,61 (very practically) |

Based on Table 1 it is known that the average response to the teacher learning using an integrated model of character education in the subjects of Mathematics and Natural Sciences for the cycle I was 3,25 and for cycle II was 3,61. Based on the average value of these can be said that in the cycle II teachers assume that the model integrates character education in the subjects of Mathematics and Natural Sciences, including the practical and the second cycle including a category of very practical. This model is practical because it adopts the pattern established by the Ministry of Education and Cultural, in accordance with the description of the training and experience I have ever attended the teachers, was developed based on the conditions for teaching and teacher reflections, and flexible making it easier for teachers to use the model, the method, and a learning strategy is commonly known by the teacher. According to Jalal *et a*l (2011) learning activities within the framework of the development of the character of the learners can use active learning approaches such as contextual learning approach, cooperative learning, problem-based learning, project-based learning, service learning, work-based learning, and ICARE (Intoduction, Connection, Application, Reflection, Extension) so easily implemented by teachers.

This model is practical because it allows teachers to implement and adapt to the conditions of the school or class being taught, so that the constraints are the reason why they have not implemented karaker education in the subjects being taught. According Maisyaroh (2013) is in fact common learning tools developed by the teacher does not meet the criteria for the preparation of integrated learning cultural values and national character. In addition, the learning activities in the learning of teachers have not listed the values of the characters in each of the steps of learning activities. It can be caused by several factors, including, teachers lack an understanding of the concept and implementation of character education, teachers have not been able to choose the values of the corresponding character to be implemented into the device, and the teacher has not been able to integrate character education into the material and the learning process.

The model developed has passed the stage of planning, implementation, and evaluation involving teachers of SMP Muhammadiyah Malang. According Khusniati (2012) The integration of character education in the learning process implemented from planning, implementation, and evaluation of learning. Approaches or learning methods adapted to the approach/method is chosen besides facilitating learners achieve the targeted knowledge and skills, also developing character.

Feasibility study is included in the category of practical and strongly suggests that the developed model has a good quality because it was developed with teachers, through a process of discussion and trial and supported by the feel of lesson study. This is in line with Jaya *et al* (2014) that in order to improve the quality of learning and optimizing the effectiveness of the learning process associated with the character, then the teacher needs to make a breakthrough and measures to address the problems, one of them by developing a learning model. Development of a model can be implemented together in a group of teachers or cross-institutional co-operate so as to create a good model or according to the needs of teachers in the classroom. Good use of learning tools will guide the implementation of quality learning in accordance with the expectations of teachers and schools in particular related to character education. Given the character education in their teens or junior high school children aimed at development, therefore the task of the teacher to condition a good learning environment for students to develop character and this will be achieved when teachers apply the right model.
The success of learning is also not free of participation of teachers. Teachers should always be creative, innovative, and willing to accept criticism, suggestions and improvements from others to improve and enhance professionalism. Teachers can find out any shortcomings during teaching if there are colleagues who observe the learning process, so that the teacher can correct these deficiencies in subsequent learning (Budur, 2013). The way it can be done through Lesson Study, which is a model of professional development of educators through collaborative learning and assessment based on the principles of sustainable collegiality and mutual learning to build a learning community (Hendayana, 2007).

Lesson study is an attempt to improve the competence of teachers being able to accommodate the things which have been hard done by teachers themselves (Susilo *et al*., 2010), Lesson study is a model of professional development of educators through collaborative learning and assessment based on the sustainable the principles of collegiality by a group of teachers (*lecturers*) to build a community of learning (*learning community*). Lesson Study is not a strategy or method of learning, but the lesson study activities can apply a variety of strategies

and methods that can be adapted to the circumstances and problems faced by the teacher at each of the learning process (Rusman, 2011; Elvinawati *et al*., 2013).

The positive influence of the lesson study model developed in line with the analysis Sulistyoningsih *et al* (2011) that an increase in teachers' competence in teaching before and after covering of attracting attention, causing the motivation, use of language, teaching styles, use of media, evaluation of learning, responsiveness to students. In competency of teachers before learning using lesson study and after using the lesson study found an increase in the competence of pedagogical, professional, social, personality is seen during the learning process. Lesson study activities related to the development of character values is an activity that gives hope to the bright openness of teachers to share knowledge and experiences in order to achieve a better quality of learning. This activity led to the improvement of the quality of education, teacher professionalism, and student character.

**Effectiveness of Character Education Model Integrated in Learning**
The model integrates character education in the subjects of Mathematics and Natural Sciences, said to be effective if there is an increase in the value of the character of students in accordance with the targets set by the teacher or school. Based on observations by the teacher to the student character value can be said that the character of students has increased in each cycle. Student character set by Muhammadiyah (2010), namely 1) religious (pious, honest, trustworthy, generous, helping each other, and tolerant), (2) moderate (intermediate between the individual and social, material and spiritual oriented and able to live and cooperation in diversity), 3) intelligent (rational, love science, open, and forward-thinking), and 4) independent (independent personality, discipline, thrift, respect time, resilient, entrepreneurial, hard work, and have a love nation. Teachers of Muhammadiyah Junior High School of Malang City choose some characters that will be raised, namely honesty, cooperation, love of knowledge, hard work, and discipline). Table 3 below shows the average number of students in each character in SMP Muhammadiyah Malang.

**Tabel 3. Rerata Nilai Karakter Siswa SMP Muhammadiyah di Kota Malang**

| Junior High Schools | Cycle I | | | | | Cycle II | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ho-nesty | coope-ration | love of know-ledge | hard work | discip-line | ho-nesty | coope-ration | love of know-ledge | hard work | discip-line |
| Muhammadiyah 1 | 2,1 | 2,5 | 1,8 | 2,4 | 1,5 | 3,0 | 3,1 | 2,9 | 3,1 | 3,2 |
| Muhammadiyah 2 | 1,9 | 2,0 | 2,1 | 2,5 | 1,7 | 2,5 | 3,0 | 2,8 | 3,0 | 2,8 |
| 'Aisyiyah Muhammadiyah 3 | 2,2 | 2,1 | 2,4 | 2,1 | 1,8 | 3,2 | 3,1 | 3,1 | 3,1 | 3,4 |
| Muhammadiyah 4 | 2,4 | 2,2 | 2,1 | 2,2 | 1,9 | 3,4 | 3,3 | 3,5 | 3,2 | 2,9 |
| Muhammadiyah 6 | 1,9 | 2,4 | 2,1 | 2,2 | 1,5 | 3,5 | 3,4 | 3,1 | 3,3 | 3,5 |
| *average of each character* | 2,1 | 2,2 | 2,1 | 2,3 | 1,7 | 3,1 | 3,2 | 3,1 | 3,1 | 3,2 |
| *average of total character* | 2,1 (less/low category) | | | | | 3,1 (good enaught category) | | | | |

Based on Table 3 it can be seen that the effectiveness of an integrated model of character education in the subjects of Mathematics and Natural Sciences in Cycle I still falls under the category of less or low, whereas in Cycle II are included in the category quite well. This is because the average value of the character in the first cycle ranged from 1.7 to 2.3 with a mean of 2.1, while the second cycle ranged from 3.1 to 3.2 with a mean of 3.1.

Character education is integrated in the subject is the introduction of values, gained awareness of the importance of values, and the internalization of values to the behavior of students through the learning process. Basically learning activities other than to make students master the competencies (material) were targeted, also designed to make students recognize, realize/care, and the values and behaviors make (Jalal *et al.*, 2011). Based on the data in Table 3, it can be said that the values are already being integrated in the learning of Mathematics and Natural Sciences. Although the values of the characters that appear still in the medium category (from poor to pretty good), it can be said that the model developed slowly able to encourage teachers to pay attention to aspects of the character of the students in addition to mastery of course material.

Integrated character education model on the learning of Mathematics and Natural Sciences starting to look effective which is shown by an increase in the values of character though not optimally showed that the teachers at Muhammadiyah Junior School of Malang assume that character issues are very important and their role as a teacher is vital. This is in accordance with the opinion of Arita (2012) that in practice character education carried out by the teacher because the teacher is the person who directly confront and dialogue with students in the classroom. Teachers have a central and strategic role for any educational reform, one of which is how to implement character education through the subjects he teaches. According Koesoema (2007) the success of the reforms in education, both at national and at local level, is highly dependent on the interpretation of the teachers towards the renewal policy in the classroom teaching. Updates curriculum nationally, will not be effective if the teachers do not ever apply in the classroom (learning).

Teachers have a central role in the learning process in schools. The position of the teacher in the school system occupies a strategic position, located in the front line, teach in class, directly confronting and overcoming the various problems that occur with students in the classroom and in the school, both academically and that is not academically. The success of the students the knowledge and skills honed sharpness, depending on teachers in a given direction, demands, guidance, and a good example. Thus, the teacher not only spearheaded education in school, but also a key to the success of national education (Directorate of Teachers and Education Personnel, 2012).

The study of Hattie (2003) says that the teacher factor contributes significantly to the improvement of the quality of learning and achieving the learning outcomes of students in school compared with other factors reinforces the statement. Therefore, there was no doubt that the availability of qualified teachers, professional, and always improving its learning system is an absolute demand that can contribute significantly to achieving educational success. In connection with it, according to Suparno (2000) to achieve success in learning learners need continuous hard work from various parties, especially educators. Teachers are obliged to always improve the quality of the content or learning materials, as well as the learning process so that learners achieve maximum results.

**CONCLUSION**

Average feasibility study for the cycle I is 3.18 or included in the practical category, while average feasibility study for the cycle II is 3.52 or included in the category of very practical. Average response to the teachers' learning by using a model of integrated character education

in the subjects of Mathematics and Natural Sciences for the cycle I was 3.25 (practical) and for cycle II was 3.61 (very practical). This model is practical for several reasons, namely 1) the development of models adopt a pattern that has been established by the Ministry of Education and Cultural Affairs, is developed based on the conditions and reflections of teachers for teaching, and is flexible making it easier for teachers to use the models, methods, and strategies that commonly known, 2) the model allows teachers to implement and adjust to the conditions of the school or class being taught, so that the constraints are the reason why they have not implemented character education in subjects that are taught, 3) model developed has passed the planning stage, implementation, and evaluation involving teachers of Muhammadiyah Junior High School of Malang with shades of lesson study. The effectiveness of character education models integrated in the subjects of Mathematics and Natural Sciences in Cycle I still falls under the category of less or low, whereas in Cycle II are included in the category quite well. This is because the average value of the character in the first cycle ranged from 1.7 to 2.3 with a mean of 2.1, while the second cycle ranged from 3.1 to 3.2 with a mean of 3.1. The values of the characters are already being integrated in the learning of Mathematics and Natural Sciences. Although the values of the characters that appear still in the medium category (from low to good enought), but it can be said that the model developed slowly able to encourage teachers to pay attention to aspects of the character of the students in addition to mastery of course material.

## REFERENCES

Aritonang, K. T. (2012). Implementation of character education through learning writing short story based on Batak Toba traditional expression. *Jurnal Pendidikan Penabur*, 11(18): 1-27.

Berkowitz, M.W. & Bier, M. C. 2007. What works in character education. *Journal of Research in Character Education*, 5(1): 29–48.

Budur, E. L. (2013). Through the integration of character education inquiry lesson study in biology learning and scientific attitude to improve cognitive learning outcomes seventh grade students of SMPN I Singosari. *Jurnal Pendidikan Sains*, 1 (2): 171-177.

Curriculum Center. (2010). *Subject teacher's guide, integrated character education in learning in secondary school*. Jakarta: Ministry of National Education.

Dedy. (2010). *Increasing professionalism researchers, educators and practitioners to support the development of mathematics national character*. Press Release National Seminar on Research, Education and Application of Mathematics, State University of Yogyakarta, Saturday, May 15th, 2010.

Directorate of Secondary School. (2011). *Draft 2 of character education implementation guide junior high school*. Jakarta, Indonesia: Directorate General of Basic Education, Ministry of National Education.

Directorate of Teachers and Education Personnel. (2012). *Guidelines for professional teacher*. Jakarta, Indonesia: Directorate General of Higher Education-Ministry of Education and Culture.

Directorate of Workforce. (2010). *TOR of character education fiscal year 2010* Jakarta, Indonesia: Directorate General of Higher Education, Ministry of National Education.

Elkind, D. H. & Sweet, F. 2004. *How to do character education*. (Online). (http://www.goodcharacter.com/Article_4.html. Accessed at Agust 25th, 2014).

Elvinawati, Sumpomo, & Amir, H. (2012). *Lesson study at the school chemistry course for improving quality learning and character development (Building Character). Jurnal Exacta*, 10 (2): 156-159.

Haikal, M. (2000). Muhammadiyah dynamics towards new Indonesia. *Jurnal Pendidikan dan Kebudayaan*, 6 (25): 428-438.

Hendayana, S. (2007). *Lesson Study: A Strategy for improving the professionalism of educators*. Bandung, Indonesia: UPI Press.

Irawati, R. P. (2013). Subjects Indonesian thematic character and cultured with children's literature for elementary students. *Varia Pendidikan,* 25(2): 157-171.

Jalal, F., Anas, Z., Hamka, M., Somantrie, H., Suharyadi & Sumiyati. (2011). *Character education implementation guide*. Jakarta: Center for Curriculum and of Books, Research and Development, Ministry of National Education. Subjects Indonesian Thematic Character and cultured with Children's Literature For Elementary Students

Jaya, I. M., Sadia, W., & Arnyata, I. B. P. (2014). Software development character education learning biology charged with setting guided inquiry to improve learning outcomes character and junior high school students. *e-Journal Program Pascasarjana Universitas Pendidikan Ganesha Program Studi IPA,* 4 (2014): 1-12.

Jinan, M. (2011). Update Muhammadiyah dynamics: Overview of religious thought. *Tajdida,* 9(1): 1-16.

Juniarso, T. (2010). Character education in school: A Proposal Idea of model development learning contract with community involvement for students in character reinforcement learning science. Surabaya: UNIPA.

Kemmis, S. & Taggart R. M. (1988). *The action research planner*. Victoria: Deakin University Press.

Khusniati, M. 2012. Character education through science lesson. *Jurnal Pendidikan IPA Indonesia,* 1 (2): 204-210.

Koesoema, A. D. (2007). *Character education: Educating children strategy in the global age*. Jakarta, Indonesia: PT. Gramedia Widiasarana Indonesia.

Koesoema, A. D. (2010). *Integral character education.* Kompas Daily, Pebruary 11th, 2010.

Kuntowijoyo. (1998). *Reinterpretation of Islamic paradigm for action*. Bandung, Indonesia: Mizan.

Lickona, T. (1992). *Educating for character: How our school can teach respect and responsibility.* New York: Bantam Books.

Lickona, T. (2007). *Character matters: How to help our children develop good judgement, integrity, and other essential virtues.* USA: Simon & Schuster Adult Publishing.

Maisyaroh, S., Sapti, M. & Maryam, I. (2013). *Implementation of character education lesson plan for high school mathematics teachers at Purworejo.* Research report. Purworejo, Indonesia: Program Studi Pendidikan University of Muhammadiyah Purworejo.

Muslich, M. (2008). *Scientific paper: Characteristics and scientific attitude*. (Online). (http://menulisbukuilmiah.blogspot.com/, Accessed Agust 9th, 2014).

Nurmandi, A. (2010). Dinamika Internal-Eksternal Kepemimpinan Muhammadiyah. *Suara Muhammadiyah,* Edition May 2010.

PP Muhammadiyah. (2009). Revitalization vision and national character. Yogyakarta, Indonesia: PP Muhammadiyah.

Rusman. (2011). *Learning models developing teacher professionalism.* Jakarta, Indonesia: PT. King Grafindo Persada.

Sahlan, A. & Prastyo, A. T. (2012). *Design-based learning character education*. Yogyakarta, Indonesia: Ar-Ruzz Media.

Saukah, A., (Ed). (2000). *Guidelines for scientific writing*. Malang, Indonesia: State University of Malang Press.

Somantri, R. G. (2008). *Science lessons still characteristically memory.* Kompas Daily. Tuesday, November 4th, 2008.

Subhan, B. (2010). *Organizers basic education and secondary school system (Review current education providers and perspective BHP).* Paper presented at the Seminar on Legal Education (BHP) As Education Provider, BPHN organized by the Department of Justice and Human Rights in cooperation with the Faculty of Law, University of Gadjah Mada and the Regional Office of the Ministry of Justice and Human Rights Yogyakarta province, on 12-13 July 2005 in Yogyakarta.

Sulistyoningsih, M., Dzakiy, M. A. & Saputra, H. J. (2011). Improved teacher competence in national character education lesson study based optimization in SMP Negeri 1 Mranggen. *Research Report.*

Suparno, P., Yoedho, M., Titisari, D. & Kartono, St. (2002). *Character education in schools.* Yogyakarta, Indonesia: Kanisius.

Susilo, H. (2009). Combining lesson study (LS) and classroom action research (CAR) for teacher professional development. *CoSMEd 2009 Proceedings*: 77-84.

Susilo, H., Chotimah, C., & Ibrohim. 2010. *Lesson Study Berbasis MGMP sebagai Sarana Pengembangan Keprofesionalan Guru*. Malang, Indonesia: Surya Pena Gemilang.

Suyatno. 2010. *Peran Pendidikan Sebagai Modal Utama Membangun Karakter Bangsa.* Paper presented in National Symposium "Development of Culture Educationg dan nation character" by oleh Kopertis Wilayah 3 Jakarta, January 12th, 2010.

Syamsuddin, D. (2012). *"Pencerahan" movement dynamics: reflection 2 years after century Muktamar and 3 years forward projection.* Paper presented at Muhammadiyah Symposium 2012.

Unijianto, B. (2009). *Science learning to Student character development.* Cyber News Edition November 29th, 2009.

Washington, E. Y., Clark, M. A. & Dixon, A. L. 2008. Everyone in School Should Be Involved Preservice Counselors Perceptions of Democracy and the Connections Between Character Education and Democratic Citizenship Education. *Journal of Research in Character Education*, 6(2): 63-80.

Wiyono, B. B. (2009). *Class action research and scientific paper writing*. Malang *Lesson Study Berbasis MGMP sebagai Sarana Pengembangan Keprofesionalan Guru*.: State University of Malang Press.

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