Character Education Approach: The Reflection of Lesson Study Implementation on Basic Mathematical Learning

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Abstract: There is a problem that becomes attention to the learning of mathematics at the base in higher education and understanding of the concepts and education of student characteristics. The creative character requires that each foundation must master the concept with good and true as a matter of studying the following materials. In addition to understanding the concepts needed to pay special attention are the student characteristics. One of the negative impacts of the development of world technology has been the moral degradation of students. To overcome the problem, learning is needed which can increase the understanding of concepts as well as the education of student characteristics. One of the ways in which lesson implementation is in learning basic education. Lesson study of learning basic mathematics with a character education approach facilitates the resolution of learning problems. The reflection phase in lesson study explored all findings in the implementation of learning and provided solutions for the implementation of further learning. The aim of reflection is to obtain learning that gives attention to the development of student character. This study used a descriptive qualitative research method that describes the reflection of basic mathematics learning, anti-derivative material, with a character education approach where the learning process used constructivist learning methods assisted by Student Worksheets which the implementation program of student learning in the field technology program. Reflection results indicate that this learning has provided an increase in understanding concepts and developing student characteristics. The results of the understanding are obtained 1) 83.33% of students can restate the concept of derivative definition, 2) 76.2% of students were able to explain verbally about concept discovery, 3) 80.95% of students are able to apply the concept in solving problems given. The character values that arise when implementing learning are hard work, responsibility, discipline, curiosity, independence, tolerance, creative, uplifting, democratic, communicative, and confident. While honesty is still lacking. For further research, it can be investigated about solutions to improve the value of honesty character in basic mathematics learning

Key words: lesson study, mathematics basic, conceptual understanding, education character, reflection

1. Introduction

The pros and cons of world technology development that are increasingly free, have more or less impacted on the crisis of the character of human resources, especially for students. They have indirectly entered into a world that is over free and gives rise to apathy for each individual (Sudibyo, 2011), although there are not a few positive

effects caused. Why are school-age children / students? The tendency of current parents to introduce technology in children from an early age for various reasons, including excessive anxiety in parents by not allowing children to play outside the home and so on, is a major concern to watch out for. Children are not mature enough to understand the effects that arise from the use of unattended technology.

The negative impacts were caused (Yudiningrum, 2014), among others, many cases of fights that originated from comments or status were raised in social networks (cyber-bullying), kidnappings and rape cases that were rife even to the world (stranger-danger), or crimes that can occur due to the honesty of children that are shown from posts on social networks (cyber-staking). This has an impact on the turmoil that has affected the transmission of all structures and domestic structures. Required implementation of mental revolution to suppress the adverse effects of increasingly developing world technology, one of which is implemented in the world of education.
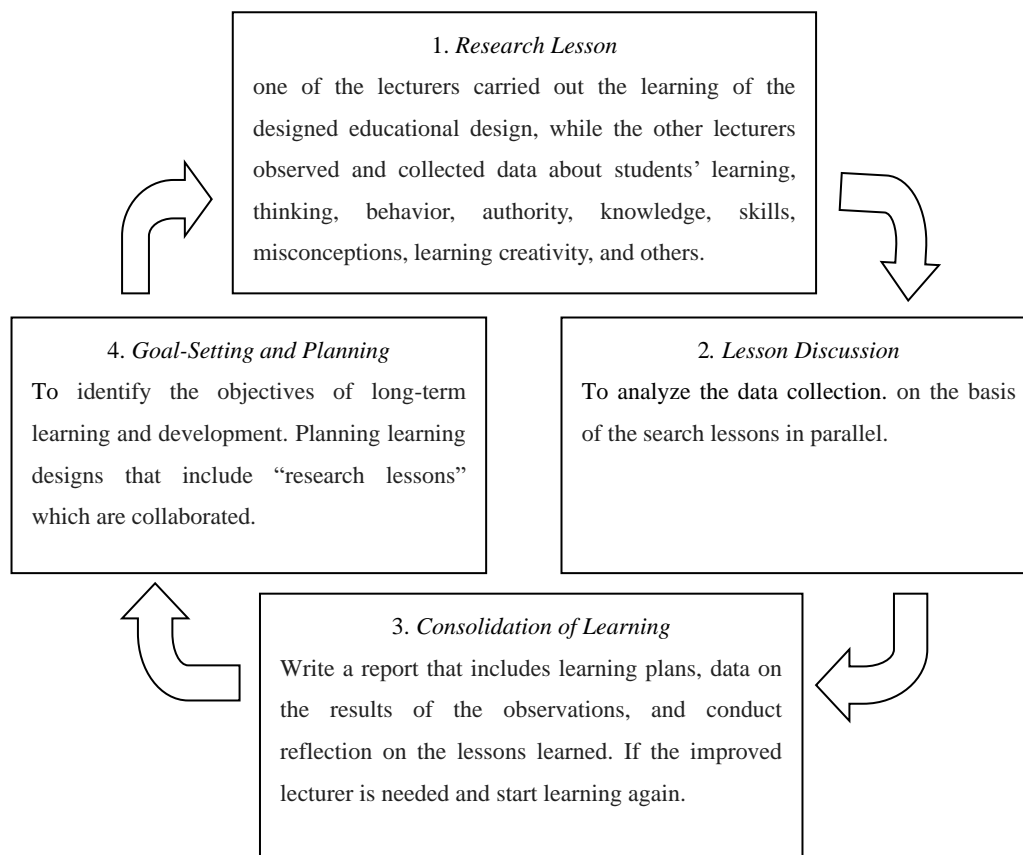
Basically education has two objectives, namely guiding learners to be smart and have virtuous behavior (Lickona, 2013). Character education is one of the tools that plays an important role in creating quality human beings and has the potential for the present (Prihaswati et al., 2017). The nature of character education is the process of guiding educators so that behavioral change, attitude change, and cultural change occur, which eventually will manifest a civilized community (Aushop, 2014). Through the national education field, it is expected to be able to improve the quality of resources in forming the character of the nation's people who are dignified to improve the civilization of a nation. There is a tendency towards conventional basic mathematics learning, procedural, memorizing formulas, giving low attention to the acquisition of concepts. Though the results of learning mathematics not only emphasize cognitive aspects, but in terms of affective and psychomotor. The cognitive effects are that students and students must remember the mathematical formula where not all humans have a high ability to remember - which affects the application of formulas or concepts in a case, while proof of the truth of a formula and theorem cannot be relied on merely memorizing formulas, especially estimating the truth with certainty. The impact is an indicator of the low understanding of the concept according to Polya (in Sumarmo, 2012). The principle of constructivism learning which emphasizes the construction of knowledge that is equipped with initial knowledge is expected to reduce the memorization of procedural formula and learning so that the conceptual understanding ability increases. Character education can be raised in learning as an affective assessment. Sumarmo (2006a, 2006b, 2010) suggested several types of soft mathematical skills, namely: disposition of values, culture, and character in learning mathematics; mathematical disposition; position of logical thinking, position of critical thinking, and mathematical creative thinking disposition, mathematical learning independence. Character education is carried out through the creation of a conducive environment, which can be done through a variety of methods of assignment, habituation, training, learning, direction and example (Mulyasa, 2013).

Lesson study activities are carried out with the aim of resolving learning problems. The Learning Study is a model of improving the quality of learning through the study of collaborative and sustainable learning based on the principles of collegiality and mutual learning, to build learning communities (Lewis, 2002). Besides aiming to improve the quality of lesson study learning aimed at preparing the future of children for a better life (Supriatna, 2014) and improving the process and quality of learning (Purnomo, 2017). This activity consists of three main stages, namely planning, implementation, and reflection. Reflection is the most important thing in the series of lesson study activities, in which all the findings obtained during the learning phase will be discussed in reflection. The target is to get learning that gives attention to understanding concepts and developing student character.

2. Methodology

This study used a descriptive qualitative research method that described the reflection of basic mathematics learning, anti-derivative material, with a character education approach where the learning process used constructivist learning methods assisted by Student Worksheets. The qualitative research focused on concepts that arise from the data. The three main stages in qualitative research (Sugiyono, 2007), namely 1) the description stage or orientation stage, the stage of describing what is seen, heard, and felt; 2) the reduction stage is the stage of reducing all information obtained; and 3) the selection stage, the stage outlining the focus that has been set into more detail to do an in-depth analysis of the focus of the problem. The results obtained are themes that are constructed based on the data obtained into a new knowledge, hypothesis, and theory. The values of the characters observed are honest, hard work, responsibility, discipline, curiosity, independence, tolerance, creative, uplifting, democratic, communicative, and confident. Attention to understanding concepts with indicators: 1) students are able to restate a concept; 2) students are able to explain orally about what they have achieved; and 3) students are able to apply concepts in problem solving.

The learning process used the concept of lesson study. The learning study is a model of education profession development through the study of collaborative and sustainable learning based on the principles of collegiality and mutual learning to build learning communities (Rustono, 2008). The implementation of collaborative activities, Lewis (2002) and Hendayana cited by Rustono (2008) states that there are three stages of learning in lesson study, namely planning (plan), implementing (do), and reflecting (see).

1. *Research Lesson*

one of the lecturers carried out the learning of the designed educational design, while the other lecturers observed and collected data about students' learning, thinking, behavior, authority, knowledge, skills, misconceptions, learning creativity, and others.

4. *Goal-Setting and Planning*
To identify the objectives of long-term learning and development. Planning learning designs that include "research lessons" which are collaborated.

2. *Lesson Discussion*
To analyze the data collection. on the basis of the search lessons in parallel.

3. *Consolidation of Learning*
Write a report that includes learning plans, data on the results of the observations, and conduct reflection on the lessons learned. If the improved lecturer is needed and start learning again.

Figure 1   Alur Pelaksanaan Lesson Study

3. Results and Findings

Lesson study implementation was carried out in Food Technology study program on anti-derivative material. The plan phase produces learning tools in the form of student worksheets, learning implementation plans, and other instruments related to research. In the implementation of the learning or at the see stage, there are several observers who observe the course of the learning process, both in terms of teaching lecturers, discussion students, and the characters of each of the actors of the learning process. Each observer makes a note of findings during learning. Recording video learning is also done for the sake of reflection. The learning video is played back to reflect on learning by collaborating with the observer's findings. The results obtained are presented as follows. Most students do not have the basic knowledge of derivative definitions. From the observer's findings there were 33 out of 42 students who did not know the definition of derivatives because they were not taught before. The solution is for lecturers to provide derivative definition material before proceeding to anti-derivative material. This has been done by the lecturer by providing derivative definitions before the discussion. Results of meeting ideas and concepts, the implementation of lesson study emphasizes the understanding of the concept of basic knowledge that is inherited. Understanding the concepts of the body of three parts is said to be a concept, explains verbally, and applies the concept of problem solving. The results of the concept of conceptual discussion can be seen in Figure 2 below.
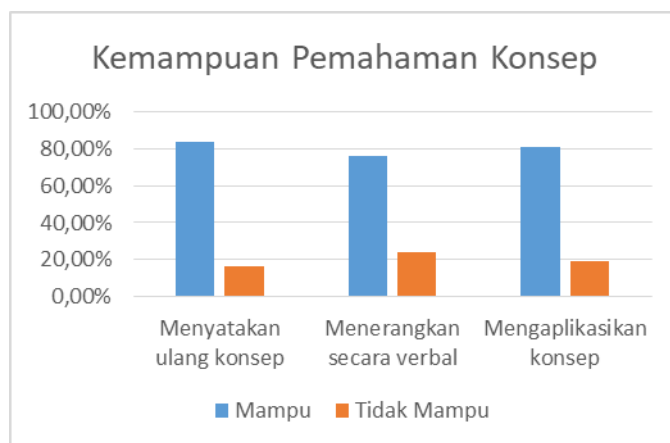

Figure 2   The Ability Graph to Understand Concepts After Being Given

When the server discussion found that 83.33% of students could restate the concept of derivative definitions which would be applied to the steps of discovering new concepts on student worksheets. Another finding during the discussion was that students sought references from other sources on the internet. However, there are also students who use the internet to find solutions to problems and there are 1 student who uses the internet for other purposes outside of learning. The result of reflection for these findings is that lecturers must be more assertive in reprimanding students who use time for things outside of learning. Not a few students also asked the lecturers about solving integral problems by substitution. In answering questions, lecturers only provide instructions, so students are still required to be independent and creative in constructing knowledge and solving problems. The lecturer asks several groups to explain the new knowledge that has been obtained. Communicatively, 76.2% of students are able to explain verbally about the discovery of concepts that have been achieved with the help of instructions in the student worksheet. Student discipline occurs when most students can solve the problem within

a specified time, and stop discussing when time have been completed. Then students are asked to present the results of their discussion. Without being appointed, confidently one of the students presented the results. The student was able to explain new knowledge about anti-derivatives clearly, in order and correctly. Other students listened to their friends' explanations, and when there was a crowd, other students gave a code to their friends to listen to the explanation. The next observer's finding was the ability of students to solve the problem of anti-derivative material. Each observer pays attention to the discussion of each group, but still focuses on the hard work of each group member. It turned out that 80.95% of students were able to apply the concept in solving the problems given. There are only a few students who still write integral forms that do not fit the definition, for example $\int -4$ should be $\int -4\,dt$. During the learning process, student enthusiasm is seen as a result of the unusual learning process that is assisted by student worksheets as a learning support tool.

The results of the findings of the student's character in addition to the importance of understanding the concept of lesson activities this study also looks at the education of student characteristics. Tahapanpland is a learning plan that can integrate the values of character in learning. The integrated character is honest, hard work, responsibility, discipline, curiosity, independent, tolerant, creative, uplifting, democratic, communicative and trustworthy. The results of the implementation of the integrated learning education character can be seen in Table 1 below.

Table 1 The Emergence of Character Values in the Implementation of Learning

Character Score	Students Activity
Honesty	There are some students who pretend to look for references on the internet even though they are used for other purposes other than learning such as opening social media such as FB, WA, and Instragram. There are students who use HP to find references to anti-derivative formulas on the website
Hard work	There are several students who hang on a group of friends to do assignments Students strive with various sources and ways to construct their knowledge into new knowledge according to the stages in the student worksheet
Responsible	All students complete their assignments to discuss student worksheets to completion Every group gets a different responsibility — compare with what is done in a good way
Discipline	Some students arrive late in learning activities Most students can solve problems in the allotted time
Curiosity	Students look for references from other sources on the internet Not a few students ask questions from lecturers
Independent	Students solve problems using student worksheets independently
Tolerance	the sudents listen to the explanations of their friends who are presenting When there was a crowd, other students coded their friends to listen to the explanation
Creative	Creative students assess the instructions given by the lecturer to solve the problem There are students who are looking for references to anti-derivative formulas on the website
Effort	Students are eager to take part in learning because of the worksheets of students who can construct basic knowledge into new knowledge Through activeness and discussion in a more motivational way to eagerly work on and higher learning
Democratic	In discussions, students discuss each other to resolve problems When there are students who want to express their opinions, other students give an opportunity
comunicative	Students are able to discuss the results of their findings with other members The student can communicate the results of the discussion of other students with the good and the right so that they can be received.
Confident	Students present the results of the discussion without being appointed

4. Discussion and Findings

The research that has been done produces a reflection of basic mathematics learning with a character education approach. The reflection shows that this learning pays attention to the ability to understand the concept of students. The implementation of learning provides the opportunity for students to discuss. By giving the opportunity to communicate the results of the discussion, the students made the students more active in learning so that the ability of students to express improved concepts. This is the case with Research in 2016 and (Wahyudi, 2015) which is always the provision of the understanding of the concept that makes the foundation more active in learning. Through constructivism-based MFIs students are given the opportunity to explore their abilities. LKM can attract interest to motivate learning (Uno, 2006) and improve learning outcomes (Garfield, 2006). Figure 2 shows the level of ability to understand the concept of each indicator. Among the three indicators, the ability to explain verbally is at the lowest level because basic math material is the material taught in the first semester and most students do not like mathematics-related material. But overall, the ability to understand the concept of students increases.

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The discussion of the education of student characteristics

The character education approach provides positive air for learning basic mathematics. 12 character values that are integrated in learning, 11 character values have positive developments from students. The character of honesty is still lacking in learning because it is given the freedom to search material from various sources including sources from the internet. The lack of supervision from lecturers is because lecturers are facilitators in learning and the number of students increases the character of curiosity and hard work, so there are students who take advantage of opportunities for other purposes. The realization of character education in learning provides opportunities for students to show good behavior (Julaiha, 2014).

5. Conclusion and Suggestion

5.1 Conclusion

The results of reflection on basic mathematics learning with a mathematical approach indicate that 83.33% of students can restate the concept of derivative definition, 76.2% of students are able to verbally explain the discovery of concepts that have been achieved, and 80.95% of students are able to apply concepts in solving

problems. All three are indicators of conceptual comprehension ability. Character values that arise are hard work, responsibility, discipline, curiosity, independence, tolerance, creative, uplifting, democratic, communicative, and confident, while honesty in this learning is still low.

5.2 Suggestion

The results of the study suggest that 1) basic mathematics learning with the help of student worksheets can be used in other study programs, and 2) further research can be carried out regarding the value of honesty character.

References

Aushop A. Z. (2014). *Islamic Character Building: Membangun Insan Kamil, Cendekia Berakhlak Qurani*, Bandung: Grafindo Media Pratama.

Garfield J. (2006). *Exploring the Impact of Lesson Study on Developing Effective Statistic Curriculum*, available online at: http://www.stat.uackland.ac.nz/-iase/publication/-11/Garfield.doc.

Jalil M. (2016). "Pengembangan pembelajaran model discovery learning berbantuan tips powerpoint interaktif pada materi interaksi makhluk hidup dengan lingkungan", *Refleksi Edukatika*, Vol. 6, No. 2.

Julaeha S. (Desember 2014). "Implementasi pendidikan karakter dalam pembelajaran", *Dinamika Ilmu*, Vol. 14, No. 2.

Lickona T. (2013). *Education for Character: Mendidik untuk Membentuk Karakter*, Jakarta: Bumi Aksara.

Lewis Catherine C. (2002). *Lesson Study: A Handbook of Teacher-led Instructional Change*, Philadelphia, PA: Research for Better Schools, Inc.

Mulyasa (2013). *Manajemen Pendidikan Karakter*, Bandung: Bumi Aksara.

Prihaswati M., Purnomo E. A. and Sukestiyarno dan Mulyono (2017). "UCLA method: The character education evaluation on basic mathematics learning in higher education", in: *The 3rd Internasional Seminar on Education and Technology-ISET*.

Purnomo E. A. (2017). "Implementasi lesson study untuk meningkatkan kualitaspembelajaran pada matakuliah kalkulus multivariabel", available online at: https://jurnal.unimus.ac.id/index.php/psn12012010/article/view/2970/2891.

Rustono (October 2008). "Meningkatkan kemampuan mahasiswa menerapkan strategi pembelajaran melalui lesson study di sekolah dasar", *Jurnal Pendidikan Dasar*, No. 10.

Sudibyo L. (2011). "Peranan dan dampak teknologi informasi dalam dunia pendidikan di Indonesia", *Widyatama*, Vol. 20, No. 2.

Sugiyono (2007). *Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R&D*, Alfabeta, Bandung.

Sumarmo U. (Desember 2006a). "Pembelajaran untuk mengembangkan kemampuan berfikir matematik", Makalah disajikan pada *Seminar Nasional Pendidikan Mathematika dan Ilmu Pengetahuan Alam*, FPMIPA UPI.

Sumarmo U. (2006b). "Kemandirian belajar: Apa, mengapa, dan bagaimana dikembangkan pada peserta didik", Makalah disampaikan pada *Seminar di FPMIPA*, Universitas Pendidikan Indonesia.

Sumarmo U. (2010). "Berpikir dan Disposisi Matematik: Apa, mengapa, dan bagaimana dikembangkan pada peserta didik", Makalah disampaikan pada *Seminar Pendidikan IPA dan Matematika di FPMIPA UPI*.

Sumarmo U. (2012). "Berpikir dan disposisi matematik serta pembelajarannya", Makalah disajikan dalam *Seminar Pendidikan Matematika di NTT tanggal 25 Februari 2012*.

Supriatna A. (2014). "Etika dan profesionalisme pendidik untuk pendidikan karakterdalam implementasi kurikulum 2013", Makalah disajikan dalam *Seminar Nasional Pendidikan Karakter di Palopo tanggal 3 Mei 2014*

Uno Hamzah B. (2008). *Perencanaan Pembelajaran*, Jakarta: Bumi Aksara.

Wahjudi E. (2015). "Penerapan discovery learning dalam pembelajaran IPA Sebagai Upaya untuk Meningkatkan Hasil Belajar Siswa Kelas IX-I di SMP Negeri 1 Kalianget", *LENSA (Lentera Sains): Jurnal Pendidikan IPA*, Vol. 5, No. 1.

Yudiningrum F. R. (2014). *Efek Teknologi Komunikasi Elektronik Bagi Tumbuh Kembang Anak*, Jurusan Ilmu Komunikasi Fakultas Ilmu Sosial dan Ilmu Politik Universitas Sebelas Maret. Surakarta.