

Improving Basic Process Skills of Science Through Character Education of Integration Learning Based on Discovery Learning Model

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Kata Kunci:

Keterampilan Proses Dasar, Pembelajaran Terpadu Pendidikan Karakter, Model Pembelajaran Penemuan.

Abstrak

Tujuan penelitian ini adalah mendeskripsikan peningkatan keterampilan proses dasar melalui pembelajaran terpadu pendidikan karakter berbasis model discovery learning. Desain penelitian ini adalah Penelitian Tindakan Kelas yang terdiri dari dua siklus. Setiap siklus terdiri dari empat tahap yaitu perencanaan, pelaksanaan, observasi dan refleksi. Hasil penelitian menunjukkan adanya peningkatan keterampilan proses sains dasar siswa. Pada siklus I keterampilan proses sains siswa mencapai 71,66% dan peningkatan pada siklus II mencapai 87,91%..

Abstract

Key Word:

Basic Process Skills, Integrated Learning of Character Education, Discovery Learning Model.

The objective of this research is to describe the improvement of basic process skills through the integrated learning of character education based on the discovery learning model. The design of this research is Classroom Action Research which consists of two cycles. Each cycle consists of four stages: planning, implementation, observation and reflection. The results of the research indicates that there is an increase in basic science process skills of students. In the first cycle, students' science process skills attain 71.66% and an increase in cycle II reached 87.91%.

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INTRODUCTION

Learning is a process of attributing the new knowledge to the cognitive structure that it has already been possessed by the students already possess (Degeng, 2013). Learning by linking the new informations obtained by the students to these relevant concepts, it is called meaningful learning (Ausubel, 1968). The significance of learning is as a result of learning characterized by the relationship between new aspects, concepts, information, and / or situations with relevant components within the student's cognitive structure (Novak, 2011). The learning process is not merely memorizing or forgetting the concepts, facts, theories, and principles freely but is an activity that links the concepts to produce a complete understanding, a concept that will be studied freely and not easily forgotten (Ausubel., et al, 1978). On the other hand, the learning process will work well and creatively if the teacher gives students the opportunity to discover the concepts, theories, or the understanding of experimental activities (Effendi, 2012).

Learning is basically about change, changes that occur continuously and in harmony. These changes occur in various aspects, namely the ability or knowledge, skills, attitudes, and beliefs (Spector, 2009; Spector, 2012). Learning concepts evolve in active, cognitive, and constructive processes in meaningful learning (Anderson & Krathwohl, 2001). Meaningful learning is a consequence of a behavioristic paradigm shift to a constructivist paradigm (Arends, 2012). Meaningful learning is also a reflection in the context of 21st century learning that demands learning that can produce human resources capable of critical thinking, problem solving, useful for the future (Jansen & Merwe, 2015). The essence of the educational paradigm shift is an emphasis on meaningful learning in order to improve life skills (Kuhltau., Et al., 2007). In the context of meaningful learning, learning that emphasizes the process of scientific performance holds a critical position, one of them on science learning. Basically science learning is designed to strengthen students' competence in terms of knowledge, skill intact, and aims to prepare students to be responsive to the environment, because by learning science students learn to understand the natural phenomena that occur in the environment. One of the most important goals of science learning is to encourage students' scientific thinking skills, train students to engage in scientific inquiry and be able to argue in a scientific context (NRC, 2012). This set of skills is called as the science process skills by the experts. These skills can be a teacher facility to ensure more active student participation, enhance students' sense of responsibility for their own learning, and gain a research method /

method. In short, basic process skills ensure the mindset and behavior of students such as scientists (Ergul., Et al, 2011).

The results of observations and interviews that have been done directly to the classroom teacher of fifth class of elementary school 45 duampanua found the problems, these are the science learning activities applied by teachers have not yet indicated any scientific performance or science practice that involves the basic science process skills of the students. This problem is based on the following findings; a. the learning process is still focused on the teachers, teachers are more likely to deliver the verbalist information to students without engaging students to practice science, besides the students just follow the instructions or to listen to the material learning about the force of magnetism that delivered by the teacher, and summarize the material in the package book; b. the learning process tends to one direction lead to saturation and decreased student attention; c. teachers are still less facilitating students to experiment, including the use of media, tools and materials, as well as learning resources that contain student activities to conduct experiments; d. teachers find it difficult to manage learning time, if students are involved in the investigation process, so that the practice of science in the class is rarely done. This also corresponds to the response of the students at the time of the interview; and e. teachers emphasize more on results, science learning is taught only as a collection of concepts and theories.

Basic science process skills are not an instant ability possessed by students, but it requires direct involvement by students repeatedly in science practices that are integrated with learning activities (NRC, 2012). This assumption is in line with the results of the study (Turpin & Cage, 2004) found that activity-based science learning, investigation, cooperative attitude-planting, and learning management have an influence on students' basic science skills. The basic student process skills can be improved through integrated learning of character education. The inclusion of character values through religious studies and citizenship alone is not enough (Benninga, 2003). However, teachers still do not integrate character education in learning, especially primary education as early education for students (Maunah, 2015). Integrating character values alone is not sufficient to improve students' process skills (Chapman, 2011). So that the required learning-based learning investigation contained in the learning model.

Learning model is one of the important things for teachers in teaching and learning process. Learning models that are used especially on science subjects should be able to improve and develop the quality of learning process in accordance with the needs of cognitive and student process skills. To improve the basic science process students need to apply a learning model that is able to optimize the learning activities so that students can be actively involved, in constructing and discovering the concepts, theories, and facts of each of what is learned in the learning process one of them is the discovery learning model (Chen & Shein, 2013; Damawati & Juanda 2016). The model learning of discovery learning is a model learning that leads the students to find and investigate by themselves about the concepts of science so that the knowledge and skills that has already been possessed by the students is not the results from memorizing process of set of facts, ideas, or thoughts must be meant by the students themselves (Arends, 2012). Through this basic rationale thought, the purpose of this research is to describe the improvement of basic process skills through integrated learning of character education based on the model *discovery learning*.

METHOD

This research is a classroom action research, which would be done cyclically. Implementation of Classroom Action Research is conducted in 2 (two) cycles. The design of this classroom action research is the model of kemmis & taggart spiral, where it consisted of 4 (four) stages for each cycle, namely planning, implementation, observing and reflection. This classroom action research conducted in the middle of february 2018 to the end of march 2018 in elementary school 45 duampanua. The subject of reseach is the students of fifth class, with the amount of students are nine male students and 10 female students. Researchers in this study acted as model teachers and in the implementation of the research process assisted by 2 (two) participants who would act as an observer. The data collection on this research is by conducting the observation, interviews, test and documentary.

RESULTS AND DISCUSSION

The result of this research is the improvement on the basic process science through the integrated learning of character education based on the discovery learning model on fifth class of elementary school 45 duampanua on first cycle is 71,66%, obtained from the rate of the first meeting is about 63,75%, in the second meeting is about 71,25%, and for the third meeting is about 80%. The basic science process skills of students have not been said to increase, because it has not reached the determined success criteria of 85% with good qualifications (B), so it is necessary to implement the corrective action, that is cycle II. While the results of research on the second cycle of 87.91% achieved very good qualifications (SB), obtained from the average of

the first meeting of 83.75%, the second meeting of 86.25%, and third meeting of 93.75%. Basic science process skills of students have been said to increase, because it has reached the determined success criteria of 85%.

Basic process skills are regarded as skills that can be applied to various sciences and reflect the behavior of scientists. In science learning, these skills can be a facility to ensure more active student participation, increase student's sense of responsibility for their own learning, and gain a method / method of research. In short, basic process skills ensure students' thinking and behavior like scientists (Ergul et al, 2011). Basic process skills enable students to explore and develop the knowledge itself scientifically. This is because it is impossible to teach all the ideas in detail from certain disciplines to students, especially with the development of science that continues with the rapidly. For this purpose, it is very important to train students to engage in inquiry activities in the classroom, especially science learning. However, we also should not be caught up in the view of science as a set of procedures that overly emphasize experimental investigation (NRC, 2012). When students engage in arguments from evidence of explanation then they will better understand the reasons first and empirical evidence of the explanation. For these reasons (NRC, 2012) proposes some basic process skill indicators in science learning that need to be upgraded to elementary school students aged 10-13 years, predicting, assessment, observing, conducting investigations, and communicating.

Improving basic scientific process skills is necessary for the achievement of science learning objectives in particular, in addition to process skills as aspects of the assessment of international studies PISA (*Program for International Student Assessment*) which is crossed by the OECD (*Organisation for Economic Cooperation and Development*) that must be upgraded. On the other hand, basic process skills are not an instant ability possessed by students, but it requires direct involvement by students repeatedly in science practices that are integrated with learning activities (NRC, 2012). This assumption is in line with some research results (Turpin & Cage, 2004) suggests that activity-based science learning and learning management have an influence on basic student process skills. Basic student process skills can be improved through the integrated learning of character education. The result of the research (Merdekawati, 2015) suggests that basic process skills such as observing, assessment, formulating hypotheses, investigating, and concluding can be enhanced through integrated learning of student character values. Integrating the values of the characters is not sufficient, so it is necessary to play an important role of the experiential learning-based model contained in the discovery model (Ergul et al, 2011). Discovery learning model is a learning model that directs students to an activity that can improve basic process science skills through experiment, where students are guided to find and investigate themselves about a concept of science so that knowledge and skills possessed by students is not the result of the process of remembering a set of facts, , or ideas but their own findings. The description is intended on the importance of improving the basic science process skills of students through the integrated learning of character education based on *discovery learning* model.

Basic science process skills are measured by using an observation sheet. There are five aspects observed, at the time the student experiments. First, the hypothesis is to suggest or conclude something that will happen based on certain thoughts or tendencies; Second, assessment is an activity or skill related to the development of suitable units of length, breadth, content, time, weight, and so on; Third, observing is the skill of collecting data or information through application with the senses; Fourth, the investigation is a student's skill to prove or previous test predictions; Fifth, communicating is the skill of delivering the opinion of other process skill results both in written and oral (Dimyati & Mudjiono, 2002; NRC, 2012).

Improving the basic process skills of students' science is influenced by the successful implementation of the action on the learning process. According to (Anyafulude, 2013) basic process skills are fundamental skills or skills that can be improved through scientific performance or experiments in the learning process. The application of characteristic values learning can shape and develop positive attitude of students, students can better understand the basic concepts, thereby improving their skills or scientific thinking ability (Benninga., Et al, 2001). The inquiry-based learning model contained in the discovery model has an important role (Ergul et al., 2011). Some findings also indicate that the discovery learning model can significantly improve or influence students' science process skills (Anyafulude, 2013; Lete, 2016; Ilmi, et al, 2012; Maarif, 2016; Hanafi, 2016; Rosdianwinata, 2015; Indrayati, 2014). integrated learning of character education based on the discovery model assisted by the material learning of activity based to improve the Basic Process Skills of Students of fifth of elementary school 45 duampanua. It is proved that the basic process skill of science students has increased from cycle I to cycle II. In the first cycle of 71.66%, with good criterion (B), obtained from the average of the first meeting of 63.75%, the second meeting of 71.25%, and the third meeting of 80%. While on the second cycle obtained data of 87.91% with very good criteria (SB), obtained from the average of first meeting of 83.75%, second meeting of 86.25%, and third meeting of 93.75%. Basic science process skills of students have been said to increase, because it has reached or more defined success criteria by 85%.

CONCLUISON

Integrated learning model-based character education discovery learning-assisted learning materials activity based in the research action class can increase the basic process skills of science grade V SD State 45 Duampanua. It is proved that the basic process of science students has increased from cycle to cycle I II. Cycle I of 71.66%, with criteria (B), obtained from the results of the meeting I average of 63.75%, the second meeting of 71.25%, and the third meeting of 80%. While on cycle II retrieved data of 87.91% criteria very well (SB), obtained from the results of the meeting the Union average of 83.75%, the second meeting of 86.25%, and the third meeting of 93.75%. The basic process skills (basic process skills) science students are already said to be increased, as have reached or more specified success criteria of 85%.

REFERENCES

- Anderson, L.W. & Krathwohl, D.R. 2001. A taxonomy for learning, teaching, and assessing. Abridged Edition. New York: Addison Wesley Longman, Inc.
- Anyafulude & Joy, C. 2013. Effects of Problem-Based and Discovery-Based Instructional Strategies on Students' Academic Achievement in Chemistry. *Journal of Educational and Social Research MCSER Publishing, Rome-Italy*, 3 (6), 105-126. DOI:10.5901/jesr.2013.v3n6p105.
- Arends, R.I. 2012. *Learning to Teach*. Yogyakarta: Pustaka Belajar.
- Ausubel, D.P. 1968. *Educational psychology: A cognitive view*. New York: Holt, Rinehart, and Winston.
- Benninga, J., Phyllis, K., & Karen, S. 2001. The Relationship of Character Education Implementation and Academic Achievement in Elementary School. *Journal of Research in Character Education*, 1 (1), 22-43. ISSN 1543-1223. Dari <http://www.fountainmagazine.com>.
- Chapman, A.M. 2011. Implementing Character Education into School Curriculum. *American School Board Journal*, 9 (11), 13-25. DOI: 10.1080/00098651003653130. Dari <http://dc.cod.edu/essai/vol9/iss1/121>.
- Chen, C.T., & Shein, H.C. 2013. The Effectiveness of Scientific Inquiry With/Without Integration of Scientific Reasoning. *International Journal of Science and Mathematics Education*. No. 20. 11-23.
- Damawati, N.A.C & Juanda, E.A. 2016. The Effect of Inquiry Based Learning on The Reasoning Ability of Grade VII Student About Heat Concept. *Jurnal Pendidikan Fisika Indonesia*. No. 12. 18-46.
- Degeng, I N. S. 2013. *Ilmu pembelajaran: Klasifikasi variabel untuk pengembangan teori dan penelitian*. Bandung: Aras Media.
- Effendi, L.A. 2012. Pembelajaran Matematika dengan Metode Penemuan Terbimbing untuk Meningkatkan Kemampuan Representasi dan Pemecahan Masalah Matematis Siswa SMP. *Jurnal Penelitian Pendidikan*, 13 (2): 4-17. Dari <http://jurnal.upi.edu>.
- Ergul, R., Simsekli, Y., Calis, S., Ozdilek, Z., Gocmencelebi, S., & Sanli, M. 2011. The Effect of Inquiry-Based Science Teaching on Elementary School Students' Science Process Skill and Science Attitudes. *Bulgarian Journal of Science and Education Policy (BJSEP)*, 5(1): 48-68.
- Hanafi. 2016. The Effect of Discovery Learning Method Application on Increasing Students' Listening Outcome and Social Attitude. *World Journal of Education*, 16 (2), 291-292. P-ISSN: 1411-3031; E-ISSN: 2442-9651. Dari <http://www.ingentaconnect.com>.
- Haris. 2014. *Peningkatan Hasil Belajar Siswa Melalui Model CTL Berbantuan Bahan Ajar*. Tesis tidak diterbitkan, Malang: Pascasarjana Universitas Negeri Malang.
- Hasan. 2010. *Pengembangan Pendidikan Budaya dan Karakter Bangsa*, Jakarta: Litbang Puskur.
- Herman, Andi. 2017. *Pembelajaran IPA Berbantuan Bahan Ajar Berbasis Kontekstual dengan Mengintegrasikan Kearifan Lokal Untuk Meningkatkan Keterampilan Proses dan Penguasaan Konsep*. Tesis tidak diterbitkan, Malang: Pascasarjana Universitas Negeri Malang.
- Hidayat, Arif. 2015. Efektivitas Model Siklus Belajar 5E Terhadap Keterampilan Proses Sains dan Kemampuan Berpikir Kritis Siswa. *Jurnal Pendidikan Sains Universitas Negeri Malang*, 3 (1), 10-16. ISSN: 2338-9117/EISSN: 2442-3904. Dari <http://journal.um.ac.id/index.php/jps/>.
- Hosnan. 2014. *Pendekatan Saintifik dan Kontekstual dalam Pembelajaran Abad 21*. Bogor: Ghalia Indonesia.
- Ilmi, A.B., Meti, I., & Rezky, M.P. 2012. The Influence of Guided Discovery Learning Methods Toward Science Skill Process in Class X of SMA 1 Teras Boyolali in Academy Year 2011/2012. *Journal of Education*, 4 (2), 45-52.
- Indrayati, I. 2014. Application of Discovery Methods to Improve Student Motivation at Fraction Operations Class VII. *Journal of Education*, 2 (1), 45-58. ISSN: 2337-8166.
- Jansen, C. & Merwe, P. 2015. Teaching practice in the 21st century: Emerging trends, challenges and opportunities. *Universal Journal of Educational Research*, 3(3), 190-199.
- Khasnis, B.Y., & Manjunath, A. 2011. Guided Discovery Method as Remedial Measure in Mathematic. *Journal International Research*, 1 (1), 21-22.

- Kuhltau, C.C., Maniotes, L.K., Caspari, A.K. (2007). Guided inquiry: learning in 21st century. London: Libraries Unlimeted Publishing.
- Kusuma, Dharma. 2011. Pendidikan Karakter Kajian Teori dan Praktik di Sekolah. Bandung: PT. Remaja Rosdakarya.
- Lete, Maksem. 2016. Peningkatan Pemahaman Konsep Sains Materi Tekanan Hidrostatik dan Hukum Archimedes Melalui Metode Pembelajaran Discovery Learning Siswa SMPK Citra Bangsa Kupang. Tesis tidak diterbitkan, Malang: Pascasarjana Universitas Negeri Malang.
- Lickona, T. 2011. Educating For Character How Our School Can Teach Respect and Responsibility. Jakarta: PT. Bumi Aksara.
- Maarif, Syamsul. 2016. Improving Junior High School Student's Mathematical Analogical Ability Using Discovery Learning Method. International Journal of Research in Education and Science (IJRES), 2 (1), 114-115. Dari www.ijres.net.
- Maunah. 2015. Implementasi Pendidikan Karakter dalam Pembentukan Kepribadian Holistik Siswa. Jurnal Pendidikan Karakter, 5 (1), 90-101.
- Mayer, R.E. 2004. Should There Be Three Strikes Rule Against Discovery Learning?. American Psychologist. 59 (1): 14-19.
- Merdekawati, Krisna. 2015. Implementation of Character Education in Chemistry Learning. International Seminar on Chemical Education. 1 (3), 267-274, ISBN: 978-602-73192-0-2. Dari <http://chemistryeducation.uin.ac.id>.
- NRC (National Research Council). 2012. Inquiry and the national science education standards: A guide for teaching and learning, Washington: National Academies Press.
- Novak, J.D. 2011. A theory of education: meaningful learning underlies the constructive integration of thinking, feeling, and acting leading to empowerment for commitment and responsibility. Meaningful Learning Review, 1(2), 1-14.
- Rosdianwinata, Eka. 2015. Penerapan Metode Discovery untuk Meningkatkan Kemampuan Pemecahan Masalah Matematika Siswa. Jurnal Pendidikan, 1 (1), 1-85. ISSN.2443.1435.
- Spector, J.M. 2009. Adventures and advances in instructional design theory and practice. Dalam L. Moller, J.B. Huett, D.M. Harvey (Eds). Learning and instructional technologies for the 21st century (hal. 1-14). New York: Springer.
- Spector, J. M. 2012. Foundations of educational technology: Integrative approaches and interdisciplinary perspectives. New York: Routledge.
- Turpin, T & Cage. B. N. 2004. The Effects of an Integrated, Activity-Based Science Curriculum on Student Achievement, Science Process Skills, and Science Attitudes. Electronic Journal of Literacy through Science, 3: 1-17.