Journal of Education and Practice
ISSN 2222-1735 (Paper) ISSN 2222-288X (Online)
Vol.7, No.3, 2016

The Effectiveness of Inquiry Learning Method to Enhance Students' Learning Outcome: A Theoritical and Empirical Review

Vera Septi Andrini
Doctoral Candidate of Learning Technologies, Universitas Negeri Malang, East Java, Indonesia and
Lecturer in STKIP PGRI, Nganjuk, Indonesia
Abdul Rahman Saleh Street No.21 Nganjuk, Indonesia

Abstract
The necessities of the 21st century requires education to continue creating the young generation to have life skills. Life skills are trained through the learning process and identified through the learning outcomes of students. One of the affecting factors for low learning outcomes is learning models. The learning model is a design study that will be conducted by teacher in the classroom. Use a less precise model of learning in the learning process that may lead to boredom or burnout, lack of understanding of concepts, and monotonous activities that makes the students are less motivated to learn. Therefore, a model of learning that according to the effectiveness of all students, one of them is inquiry learning model. Inquiry is the process of using the intellectual students in acquiring knowledge in how to find and organize the concepts and principles into an order of importance according to the student. Inquiry does not only develop intellectual abilities but all potential students, including the emotional and also skills development.
Keywords: Inquiry Learning Model, Learning Outcomes

Introduction

Education is known as a conscious effort to develop the potential of human resources (HR). It is the only way for humans to be better in improving their resources to compensate for any developments that are not far behind by advances in technology. Education aims to develop human qualities, as an activity that is aware of the purpose, then in practice, it is a continuous process in every type and level of education which are all related in an integral educational system. The purpose of education is to provide guidance or direction to teachers in order to choose and determine methods of teaching or provide a learning environment for students (Hamalik, 2001).

The phenomenon that often occurs during the process of learning activities is that most students are more passive, reluctant, afraid or shy to express his opinion, this situation will certainly disrupt the smooth learning and creativity of students in learning activities. In addition, the learning process is still centered on the teacher, the teacher tends to communicate in one direction with many providing material and slightly provide opportunities for learners to interact through performance or verbal communication. If this is allowed to continue will cause more and more students have difficulties in learning so that the study results are expected not conform to what is expected.

The necessity of the 21st century requires education to continue creating the young generation who have life skills so that they can survive and compete in the global community. Life skills needed consist of the ability to think critically, the ability to communicate effectively and efficiently, the ability to develop technology (Silva, 2008) and the ability to work in a flexible, productive, innovative and responsible (Suto, 2013). Life skill is trained through the learning process and identified through the learning outcomes of students.

Sudjana (2000) revealed that the learning results obtained by students affected by two main factors that is: the student and the factors that come from outside the student or environmental factors, of which 70% are influenced by the ability of the students themselves, and 30% are affected by environment. Learning outcomes are often referred to as "scholastic achievement" or "academic achievement" is the whole efficiency and results achieved through the learning process in schools that expressed by numbers or values based on tests of learning outcomes (Briggs, 1979). According to Gagne and Driscoll (1988) is the result of learning abilities of the students as a result of the act of learning and can be observed through the appearance of the students (learner 's performance).

Nasreen and Naz (2013) revealed that the factors affecting low learning outcomes such as learning models. The learning model is a design study that will be conducted teacher in the classroom. Use a less precise model of learning in the learning process may lead to boredom or burnout, lack of understanding of concepts, and monotonous so that students are less motivated to learn. Therefore, a model of learning that according to the effectiveness of all students, one of them is a model of inquiry learning.

Inquiry learning model is learning that requires students to solve problems through investigation activities that increase the skills and knowledge independently (Trna, Trnova & Sibor, 2012). According to Sanjaya (2006), inquiry learning is a series of learning activities that emphasizes the process of thinking

critically and analytically to seek and find their own answer to the problem in question. Inquiry learning is built on the assumption that humans have an innate urge to find their own knowledge. The main objective inquiry learning is helping students to develop intellectually disciplined and thinking skills by providing questions and get answers on the basis of curiosity (Sanjaya, 2006).

With the inquiry learning method will train students to dare to express opinions and find their own knowledge that is useful for solving problems. The use of inquiry learning methods efficiently and effectively will reduce the monopoly of teachers in mastering the course of the learning process, and the boredom of the students in a lesson will be reduced (Soewarso, 2000).

Based on the phenomenon that often occurs during the process of learning activities, lack of student learning outcomes are very concern. To that end, the study on improving student learning outcomes through inquiry learning method be interesting to do a study.

2. Literature Review

Inquiry Learning Methods

The selection strategies and appropriate learning methods will enhance students' creativity in learning. The existence of the method is very important in education, where the presence of methods to facilitate the achievement of the desired objectives. Thus, a teacher has absolute method of transferring knowledge to their students. According to Sumiati (2009), teaching method emphasizes the learning process actively in efforts to acquire the capability of learning outcomes. Using appropriate teaching methods is aimed at solving the problems that arise in the learning process. One of the methods suggested in the curriculum in 2013 is an inquiry model, this method is best used in the learning process. This model directs the learners to find the problem and then being able to solve the problems found scientifically. Inquiry method refers to constructivism theory, learning is an active process in which learners construct new ideas or concepts based on previous experience and knowledge.

Barlow (1985) stated that the use of intellectual inquiry is a process of acquiring knowledge with students in how to find and organize the concepts and principles into an order of importance according to the student. Kardi (2003) defined inquiry is a learning model that is designed to teach students how to examine issues and questions based on facts. Inquiry model emphasizes the process of seeking and finding, the role of students in this model is to seek and find their own solutions in a subject matter while the teacher as facilitator and mentor students to learn. In general inquiry is a process that varies and includes the activities of observing, formulating relevant questions, evaluating the book and other sources of information critically, plan investigation or investigation, reviewing what is already known, carry out experiments or experiments by using a tool to obtain data, analyze and interpret the data, and make predictions and communicating the results (Ibrahim, 2007).

Based on some above mentioned understanding, inquiry model is a method used in the learning process so that students have the ability to ask questions, examine, or investigate something. which involves all the student's ability to search and investigate in a systematic, critical, logical, analytical, so that they can formulate their own

Sagala (2006) stated that there is five steps to be taken in carrying out the inquiry model such as: (1) the formulation of the problem being solved by students, (2) set a temporary answer (hypothesis), (3) students seeking information, data facts needed to answer the problem, (4) draw conclusions or generalizations of the answer, and (5) the conclusions or generalizations apply in new situations.

Meanwhile, according to Sajaya (2006), it is: (1) orientation, (2) formulating the problem, (3) proposed a hypothesis, (4) collecting data, (5) test the hypothesis, (6) formulate conclusions. Sund and Trowbridge (1973) suggests three kinds of methods of inquiry as follows: 1) Guided Inquiry where the learners acquire in accordance with the required guidelines. The guidelines are usually in the form of questions that guide. This approach is used primarily for students who have not experienced learning by inquiry method; 2) Free inquiry in which the learners do their own research like a scientist. At this teaching, learners should be able to identify and formulate a range of issues to be studied; 3) Modified free inquiry; on this inquiry the teacher gives the problem and then the students were asked to solve these problems through observation, exploration, and research procedures.

Students' Learning Outcome

Learning outcome is often referred as "scholastic achievement" or "academic achievement" that is the whole efficiency and results achieved through the learning process in schools that expressed by numbers or values based on achievement test, Briggs (1979: 147). According to Gagne and Driscoll (1988: 36), it is the result of learning abilities of the students as a result of the act of learning and can be observed through the appearance of the students (learner 's performance).

Reigeluth (1983) clasified taxonomy of learning into three variables which is the condition variable, the method variable, and results variable. Learning outcome variable is defined as all the effects that can be used as

an indicator of the value of the use of learning strategies under different conditions, Degeng (1989). Meanwhile, according to Gagne and Briggs (1979: 49-50) there are five categories of capability of learning outcomes which are: (1) intellectual skills, (2) cognitive strategies, (3) verbal information, (4) motor skills, and (5) attitudes.

Meanwhile, Reigeluth (1983: 15) argued that the learning outcome can also be regarded as an effect that gives a measure of the value of the method (strategy) alternatives under different conditions, there is a real and desired outcomes. Furthermore Riegeluth (1983: 94) stated that specifically, the learning outcomes is a performance that is indicated as a capability that have been obtained. The study results are always expressed in the form of objectives (specific) behavior (performance).

Learning outcome is influenced by several factors, both factors come from internal and external factor. According to Suryabrata (2012: 27), internal factors consists of physiological factors and psychological factors (intelligence, achievement motivation and cognitive ability), while external factors are environmental factors and instrumental factors (teachers, curriculum, and learning models), Gagne (1985: 62) refer to as internal conditions and external conditions.

Bloom (1982: 11) suggested three main factors that affect learning outcomes such as cognitive ability, achievement motivation, and the quality of learning. Furthermore, according to the learning outcomes by Degeng (1989) covered all securities that can be used as an indicator of the value of the use of learning methods under different learning conditions. At a very general level. Learning outcomes can be classified into high which is: (1) effectiveness, (2) efficiency, and appeal.

Learning effectiveness is usually measured by the level of achievement of the learners. The aspects which can be used to describe effectiveness of study is: precision control of behavior is learned, speed performance, the level of transfer of learning, and retention of what is learned. Learning efficiency is usually measured by the ratio between the effectiveness in the amount of time spent studying and / or the amount of the cost of learning to use. Meanwhile, the appeal of learning is usually measured by observing the tendency of students to maintain learning. The appeal of learning closely related to the appeal of fields of study, where the quality of teaching will usually affect both. That is why the measurement of the tendency of students to continue or not continue to learn can be attributed to the learning process itself or to the field of study, Degeng (1989).

The Relationship of Inquiry Learning Model and Learning Outcomes

In the overall education effort, the learning process is the most important activity, because through the process of educational goals that will be achieved in the form of personal changes in behavior or learners. The development model of learning over time continues to change. Educators teaching model needs to be understood in order to implement effective learning and improve learning outcomes. In its application, the learning model that must be done in accordance with the needs of learners because each model has a purpose, principles and the main emphasis is different.

The effectiveness of the learning model is determined by the professionalism of teachers in giving lessons. In carrying out their duties professionally, teachers need a steady and complete insight about teaching and learning activities. A teacher must have an overall picture of how the process of teaching and learning that occurs and what steps are necessary so that tasks can be performed well and obtain results as expected. One of the needs to have an insight into the teacher is teaching and learning strategies that outline the bow to act in order to achieve the objectives that have been outlined. With this strategy, teachers have guidelines with respect to various alternative options that may be, can be, or should be taken so that teaching and learning activities that take place on a regular, systematic, purposeful, smoothly and effectively.

In teaching and learning strategies, there are several points to choose the system of teaching and learning in which there are "inquiry" learning model. This inquiry learning model is expected to be able to improve student learning outcomes. This is in line with Dimyati and Mudjiono (1999) that the learning outcomes are things that can be viewed from two sides of the side of the students and teachers. One factor of the teaching is learning method used. Sumiati (2009) stated that the learning method emphasizes the learning process actively in efforts to acquire the capability of learning outcomes. Using appropriate learning methods aims to solve the problems that arise in the learning process. It certainly can improve student learning outcomes. Zimmerman and Risemberg (2006) shows that confidence and awareness to allow students to become independent learners is highly correlated with academic quality improvement. This view is able to provide an increase in the teaching and learning process in the classroom and other contextual factors that conclusively will affect student learning and motivation.

Glasser and Brunstein (2007) studied 113 elementary school students in Germany by using experimental and qualitative methods on the response of a diary during the treatment. In this study, students who have strategic thinking composition as a component of self-regulation procedures were compared with students who use the strategy of composition thinking or learning style which are the same but did not receive the instruction of self-regulation, as well as compared to students who receive didactic lessons. Based on the results of the post-test after 5 weeks of implementation of the treatment, the students who use the strategy of

composition thinking or learning style self-generating process of learning and learning outcomes are more comprehensive and qualitatively has a story the experiences during the learning process which are written in diary better than students who does not accept self-regulation instructions.

Akinoglu and Tandogan (2007) conducted a study of the impact of problem-based learning has active role in scientific education on students' academic performance and learning concepts. In a quantitative and qualitative research methods used. Research studies conducted in 50 classes, 7 students in 2004-2005 academic years, in public schools in Istanbul. Results of study stated that the learning model has positively affect student achievement and students' conceptual development.

Suwondo & Wulandari (2013) in their study concluded that students' attitudes changed after using inquiry learning model. In addition, the findings indicated that the learning outcomes of the inquiry learning model, the achievement of the majority of students from the two groups are at a good level. This means that inquiry-based learning can be used as one method to improve student achievement. Abdi (2014) concluded that there are differences in learning outcomes of students who take the group inquiry learning model with a group of students who take the conventional learning model, where students who take the inquiry learning model to obtain a higher value than the group of students who take conventional learning models. AVSEC & Kocijancic (2014) stated that the inquiry-based learning has an effective teaching approache in education. This has an impact on the increase in the knowledge acquisition of technology, the development of problem-solving skills and the ability to make critical decisions. Trianto (2007) stated that the inquiry does not only develop intellectual abilities but all potential students, including the emotional and skills development.

Conclusion

The selection of the strategies and appropriate learning methods will enhance students' spirit and creativity in learning. The existence of the method is very important in education, where the presence of methods is to facilitate the achievement of the desired objectives. The effectiveness of the learning model is determined by the professionalism of teachers in giving lessons. In carrying out their duties professionally, teachers need a steady and complete insight about teaching and learning activities. A teacher must have an overall picture of how the process of teaching and learning that occurs and what steps are necessary so that teaching tasks can be performed well.

Using a less precise model of learning in the learning process may lead to boredom or burnout, lack of understanding of concepts, and monotonous learning which cause the students to be less motivated to learn. Therefore, a model of learning is according to the effectiveness of all students, one of them is an inquiry learning model. Inquiry learning model is learning that requires students to solve problems through investigation activities that increase the skills and knowledge independently.

Inquiry learning model provides the opportunity for students to construct their own knowledge, using concepts that have been held to solve the problems encountered in other words, and students have the opportunity to link new information with existing cognitive structure resulting in meaningful learning. One thing that should be noted by teachers in teaching biology with the inquiry model is the teacher's job only as a facilitator and mediator, which help students to learn and use the skills of their process to gain more knowledge.

Students' activeness to observe, guessing, and infers through groups activities and communicate the results of the investigation with more emphasis on learning. In addition to cognitive abilities, psychomotor and affective abilities of students can be developed.

Inquiry learning is built on the assumption that humans have an innate urge to find their own knowledge. The main objective of inquiry learning is helping students to develop intellectually disciplined and thinking skills by providing questions and get answers on the basis of curiosity.

Studies on improving students' learning outcomes through inquiry learning method will be continued for the researcher's dissertation, especially those associated with the effect of inquiry learning on the students' learning outcomes which have different learning motivation level.

Reference

Abdi, A.,(2014). The Effect of Inquiry-based Learning Method on Students' Academic Achievement in Science Course, Universal Journal of Educational Research, 2(1): 37-41

Akinoglu and Tandogan. (2007). The Effects of Problem-Based Active Learning in Science Education on Students' Academic Achievement, Attitude and Concept Learning. Eurasia *Journal of Mathematics, Science & Technology Education*, 2007, 3(1), 71-81.

Avsec, S dan Kocijancic, S.,(2014). The Effect Of The Use Of An Inquiry Based Approach An Open Learning Middle School Hydraulic Turbine Optimisation Course, World Transactions on Engineering and Technology Education 12(3): 329-337

Barlow, Daniel Lenox, (1985). Educational Psychology: The Teaching-Learning Process, Chicago: The Moody Bible Institute

Bloom, Benjamin S. (1982). *Human Characteristics and Shcool Learning*. New York: McGraw-Hill Book Company.

Briggs, Leslei, J. (1979). *Instructional Design Principles and Applications*. New Jersey: Englewood Cliffs.

Degeng, I. N. S. (1989). *Ilmu Pengajaran Taksonomi Variabel*, Jakarta: Departemen Pendidikan dan Kebudayan, Dirjen DIKTI: Proyek Pengembangan Lembaga Pendidikan Tinggi. .

Dimyati dan Mudjiono. (1999). Belajar dan Pembelajaran. Jakarta: Rineka Cipta

Gagne, R. M. (1985). *The Conditions of Leartwg and Theory of Instruction,* 4th. Edition.

Gagne. R.M. dan Driscoll, M.P. (1988). Essentials of Learning for Instruction. Second edition. New York: Prentice Hall.

Glaser, C., & Brunstein, J. C. (2007). Improving fourth-grade students' composition skills: Effects of Strategy Instruction and Self-Regulation Procedures. *Journal of Educational Psychology*, 99 (2), 297-310.

Hamalik, U. (2001). Proses Belajar Mengajar. Jakarta: Bumi Aksara.

Ibrahim. (2007). Penelitian dan Penilaian Pendidikan. Bandung : Sinar Baru Algensindo

Nasreen, A and Naz, A. (2013). A Study of Factors Effecting Academic Achievement of Prospective Teachers. *Journal of Social Science for Policy Implications, 1*(1), 23-31

Reigeluth, C.M. (1983). *Instructional Design Theories and Models: An overview of their current status*. Hillsdale, NJ: Lawrence Erlbaum.

Sagala, Syaiful.(2006). Administrasi Pendidikan Kontemporer. Bandung: Alfabeta

Sudjana, N.(2000). Dasar-dasar Belajar Mengajar. Bandung: PT Sinar Baru Algensindo

Sanjaya, W. (2006). Strategi Pembelajaran. Jakarta: Kencana Prenada Media Group

Suryabrata, S. (2012), *Psikologi Pendidikan*, Jakarta, RajaGrafindo Persada.(Rajawali Press).

Sund, R B. and Trowbridge, L.W. (1973). Teaching Science by Inquiry in the Secondary School. Columbus, Ohio: Charles E. Merrill Publishing Company.

Silva, E. (2008). *Measuring Skills for 21st Century*. Washington D.C: Education Sector

Sumiati dan Asra. (2009). Metode Pembelajaran. Bandung: CV Wacana Prima

Suto, Irenka. (2013). *21st Century skills: Ancient, Ubiquitous, Enigmatic?*. Cambridge: A Cambridge Assessment Publication

Soewarso.(2000). Cara-cara Penyampaian Pendidikan Sejarah Untuk Membangkitkan Minat Peserta Didik Mempelajari Bangsanya. DEPDIKNAS

Suwondo dan Wulandari. (2013). Inquiry-Based Active Learning: The Enhancement of Attitude and Understanding of the Concept of Experimental Design in Biostatics Course. Asian Social Science; Vol. 9, No. 12 Tahun 2013. Canadian Center of Science and Education.

Trianto. (2007). *Model-model Pembelajaran Inovatif Berorientasi Konstruktivistik*. Jakarta: Prestasi Pustaka.

Trna, J., Trnova, E and Sibor, J. (2012). Implementation of Inquiry Based Science Education in Science Teacher Training. *Journal of Educational and Instructional Studies*, *2*(4), 199-209

Zimmerman, B. J., & Risemberg, R. (1997). Self-regulatory Dimensions of Academic Learning and Motivation. In G. D. Phye (Ed.), *Handbook of Academic Learning: Construction of knowledge* (pp. 105–123). San Diego, CA: Academic Press.