

Endang Susantini_Artikel13

by Endang Susantini

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The Influence of Inquiry Method on Student Learning Result With Different Class Learning Style on Plantae Material.

S Ariani^{1*}, Y S Rahayu², and E Susantini²

¹ SMA Yadika Bangil, Indonesia

² Universitas Negeri Surabaya, Indonesia

*Corresponding author: silfiariani16070795031@mhs.unesa.ac.id

Abstract. The fundamental issue that rarely gets the attention of schools in the learning process is how teachers teach the internal environment of learning is prepared. The Learning process done so far rarely touches how the internal environment is formed so that the learning process can provide maximum results. The strategy with inquiry methodology with class division based on learning style was developed as an effort to improve the learning outcomes also look for alternative learning environment more conducive so that the teacher more easily choose the right learning method. This research was an experimental research with aims to: 1) Describe the influence of Inquiry learning methods and different learning styles on student learning outcomes, 2) To explain which learning styles are the most influential in the implementation of guided Inquiry learning methods to improve student learning outcomes. This research used experimental squasize (quasi experiment) with 1x3 factorial design. Student data analysis technique result obtained in test with ANACOVA. Based on ANACOVA statistic test, the value of A.Sign learning result was 0,019 and smaller than the level of research significance ($\alpha=0,05$). Post Hoc follow-up Tests on learning outcomes showed that kinesthetic learning styles provided the best results when applied with inquiry methods.

1. Introduction

The learning process has the goal to change a person's behavior based on his experience and interaction with the environment. This change should be settled and applicable in life. Learners in the learning process is a unity of individuals who have their own foreign characteristics. Therefore the learning process must be able to accommodate the diversity of these individuals so that each of these individuals have the ability to actively seek, process, construct and use of knowledge [1]. For that learning should be concerned with the opportunities given to learners to construct knowledge in their cognitive processes. In its implementation, the application of learning methods according to the curriculum of 2013 should be able to make students involved in process skills such as observing, classifying, measuring, predicting, explaining, and concluding as well as finding the right form of interaction that is able to accommodate the diversity of students in absorbing information [2].

To achieve that goal, guided inquiry method applied to the class with different modalities will give maximum result to the achievement of student learning result because the mercury in its execution there are still problems especially related to the spirit of students who are not yet accustomed to do scientific



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method and the provision of learning environment according to the way easiest for students in learning [3].

Based on the results of the analysis of the student's daily test score shows that the average biological value obtained by students is 5.5 This value is still below the Minimum Mastery Learning Criteria (KKM) SMA Yadika Bangil namely: 70.00. Level achievement of low learning outcomes by learners in class X SMA Yadika Bangil Kab. Pasuruan is caused by several factors including low student input, inadequate learning facilities, less learning time, teacher dominance in learning, teachers have not found the right method of learning and has not found the proper form of interaction that is able to motivate students in teaching and learning process. One of the factors that arise from within the learners that enough to give influence in the learning process and rarely used as the basis of initial ability is the learning style of students. Learning style becomes very important because it is an expression of education that is closely related to the uniqueness of each individual, in absorbing or understanding the information received [3].

Inquiry learning strategy has a significant effect on the biology study of cognitive domain [4]. But the reality in the class shows, in Inquiry learning there are still some students who are less excited especially the students who are not yet accustomed to perform there should be an explanation about inquiry. Psychological condition of students who are not good makes the learning process is not running optimally. For that we need to find a special strategy for Inquiry method can be run optimally for all students, one of them grouping the process of learning Inquiry in class with different learning styles. The application of inquiry methods in the classroom with different modalities is expected to improve students' learning outcomes and provide their own motivation in teaching and learning activities and ultimately students have the spirit, discipline, responsibility and seriousness in the learning process.

2. Experimental Method

2.1 General Background of Research

This research was conducted in Senior High School (SMA) of Yadika Bangil (Pasuruan, Indonesia) with the senior high school students of 10th grade who took biology subject in school year 2017/2018. This research was an experimental research with aims to: 1) describe the influence of Inquiry learning methods and different learning styles on student learning outcomes, 2) know which learning styles are the most influential in the implementation of guided Inquiry learning methods to improve student learning outcomes

2.2 Sample of Research

The participants were the students of grade X SMA Yadika Bangil Kab. Pasuruan 2017/2018 academic year, amounting to 133 students. The classes that are the subjects of the study are Class X IPA 1 (visual class), X IPA 2 (auditory class) and X IPA 3 (kinesthetic grade). The students' learning modalities are obtained from school data tested on each new student. The research design as follows:

Research design.

Table 1. Research Design

Treatment learning Sthyle	Guided Inquiry Method
Visual	O ₁
Audiori	O ₂
Kinetetik	O ₃

O₁ = The value of visual learning result test

O₂ = The value of the Auditory learning result test

O₃ = The value of kinesthetic learning test results

2.3 Instrument and Procedures

This research used experimental squasize (Squasi experiment) with 1x3 factorial design. The exsperiment squares carried out for research residing in situations where controlling or managing the study are perfectly difficult, for example in a school system that is intake and indivisible to produce a suitable or random sample [5]. The design was designed to determine the causal relationships of the learning method by involving the experimental class (using guided Inquiry method) on learning outcomes with different learning styles. The factorial design model 3×1 is used to determine the effect of a treatment in research involving two variables with different levels. One variable with two levels, the learning method, and other variables consisting of three levels of learning styles of students, namely visual, auditory and kinestetik. The students' cognitive learning outcomes were measured by means of an objective test consisting of 25 items. The data of the research were analyzed by using N-Gain analysis to know the increase of pre-test and post-test value. Further data is tested by ANACOVA satellites test and acting as covariate is student's learning modality. Post Hoc tests are performed, to find out the best learning styles that can be used to apply with inquiry methods.

2.4 Data Analysis

Data analysis conducted in this study include analysis of learning material validity, lesson plan implementation, observation of student activities during the learning process, test result learning after the learning process takes place. Analysis of learning outcomes by appendix and assessment guidance on aspects of knowledge using a scale of 0-100 with the provisions of predicate as follows: Very good (A) 86 -100, Good (B) 71 – 85, Quite 56 – 70 Less <55. Basic competence (KD) on core competence (KI) 3 and KI (4) learning outcomes, is said to achieve completeness individually if it meets the minimum completeness criteria established by the school of 75 and has a minimum prediction of B (good). Data in the form of student learning outcomes from the post-test is processed in three main groups namely groups of students who have auditory, visual and kinesthetic learning styles. To know the improvement of learning result before and after treatment of the method of mercury was done statistical analysis in the form of N-Gain analysis. N-gain was determined using this equation: $n\text{-gain} = (\text{score post-test} - \text{score pre-test}) / (\text{maximum score} - \text{pre-test score})$, with the criteria: (1) if $n\text{-gain} \geq .7$ (high), (2) if $.3 < n\text{-gain} < .7$ (moderate), and (3) if $n\text{-gain} \leq .3$ (low). Statistical analysis is used to test the research hypothesis. This analysis is applied to data of learning result that is pre-test and post-test data. Hypothesis testing used to know differences in student learning outcomes after the application of inquiry methods with different learning styles of students. To see any difference to these variables ANCOVA (Analysis of Covariance) method is used in SPSS 20.0 for windows program.

3. Result and Discussion

The results of the study were based on the descriptive analysis of the learning outcomes using the average N-Gain ratio of pre-test and post-test for the visual class were 0.74%, auditory class 0.73 % and kinesthetic grade 0.80%. Based on learning comprehensiveness obtained information that the pre test of all students with learning styles in different classes no one completed, but after inquiry conducted post-test results show the changes in completeness as expected. Visual class completeness of post-test result that is 91,66%, class of auditory mastery of post-test result that is 0,89% and kinesthetic grade of completeness of learning result of post-test that is 100%. ANACOVA statistic test obtained by value at A. sign learning result that is 0,019 and smaller than level of significance of research (α), that is equal to 0,05. Hence H_0 is rejected and H_1 accepted or can be concluded that there is influence of learning style of student in different class to student learning outcomes. Post Hoc follow-up Tests on learning outcomes suggest that kinesthetic learning styles (0,013) deliver the best results compared to visual learning styles and auditori when applied with inquiry methods. The following bar chart shows the improvement of learning outcomes in pre-test and post-test by inquiry methods on different classroom learning styles on the N-Gain and ANCOVA statistical test.

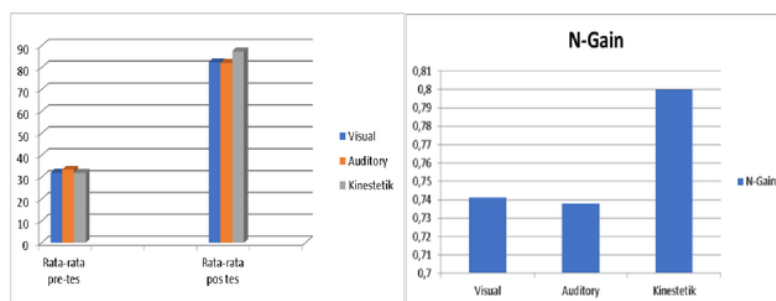


Figure 1. Diagrams of learning outcomes before and after inquiry are applied with different modes of class.

Based on the research results obtained information that the use of methods of inquiry with different learning styles in a descriptive analysis showed significant changes. The results of this study are in accordance with previous research conducted among others [6] which proves that students who are taught by inquiry based learning achieves higher academic assessment on the value of post-test compared with conventional learning. Learning with guided inquiry method has an increase in the value of post-test when compared with pre-test value, it is charged because with guided inquiry students will have more confidence than at the end of learning and students tend to favor laboratory experiments that have a method that combines pure mercury-based laboratory processes with a teacher-based process-based lab-laboratory [7]. Guided inquiry with the process that makes students more experienced in the learning process so that learning can be more meaningful, and make students more master the learning materials [8]. Guided inquiry learning method is a learning method with inquiry syntax that gets attention by explaining inquiry process, identification and problem formulation, hypothesis formulation, data collection, data interpretation, formulating conclusion, reflecting problem situation and thinking process used to investigate according to learning style requirement students [9]. In guided inquiry activities, the teacher asks questions for investigation, then gives the learner time to deliver inquiry solutions in the delivery process capable of providing experience elements through direct observation, conversation or student discussions. This inquiry activity is able to emphasize feelings, sensations and imagination as a complement in improving analytical, reasoning, and problem solving skills in a sequential and logical order. Learning by inquiry method in accordance with visual student learning style because with the inquiry syntax students learn by seeing, observing by demonstration, or viewing the lesson material presented in the form of video. Learning with guided inquiry method in accordance with auditory learning style because in inquiry is guided by learning activities by listening, discussing, questioning and answering. While students with kinesthetic learning styles correspond to guided inquiry because in the process of inquiry there is physical activity, direct involvement, responding to physical attention, moving, learning through practice, memorizing by seeing, using lots of body cues and often talking with gratification. Students with kinesthetic styles have a tendency to be silent and sit for hours because the desire for self-exploration and activity is facilitated by the implementation of guided inquiry method [10]. With the high post-test results achieved in the three different learning styles, it indicates that guided enchanting application is very effective when applied in classes with different student learning styles.

Based on the statistical analysis, it is found that the use of inquiry method with different learning styles has an effect on the students' learning outcomes. This is indicated by the value in A.sign learning outcome is 0.019 and smaller than the level of significance of research (α), which is 0.05. so H_0 is rejected and H_1 accepted or can be concluded that there is influence of learning styles of students in different classes against student learning outcomes. Guided inquiry based on classroom learning styles with different shapes and characters requires teachers to pay more attention to the needs of students in learning. Individual differences will affect the speed, methods and activities of students in learning. Learning will give good results if the teaching and learning process takes into account individual needs.

Style in accordance with the characteristics of learning to make students more motivated and further improved academic achievement. Conversely, if the adjustment between teaching and learning is not appropriate, then academic and attitudinal attitudes will degenerate [3]. Teachers as facilitators in the inquiry process have skills in managing the learning process, providing conditions that make students interested and always pay attention in the learning process, responding to the needs of the students by observing the way students learn and provide opportunities for students to learn by building a more productive environment, fun, so students can be motivated to do teaching and learning activities [11].

The learning style of learning which is the intrinsic motivation of the teacher with the inquiry syntax makes the teacher always able to nurture and nurture and provide positive attitude encouragement, providing comfortable environmental conditions for more meaningful learning outcomes. Post Hoc advanced tests The results of the study show that H_0 is accepted or rejected on a visual-auditory, visual auditory comparison. Comparison between visual-kinesthetic class, auditory-kinesthetic, H_0 is rejected and H_1 accepted, so it can be concluded that inquiry method with kinesthetic learning style has the best effect on learners' learning outcomes. Guided inquiry based on classroom learning styles with different shapes and characters requires teachers to pay more attention to the needs of students in learning. Individual differences will affect the speed, methods and activities of students in learning. Learning will give good results when the teaching and learning process takes into account individual needs. Style in accordance with the characteristics of learning to make students more motivated and further improve academic achievement. Conversely, if the adjustment between teaching and learning is not appropriate, then academic and attitudinal attitudes will degenerate [3]. Teachers as facilitators in the learning process should have skills in managing the learning process, providing conditions that make students interested and always pay attention in the learning process, responding to the needs of students by observing the way students learn and provide opportunities for students to learn by building a more productive environment, fun, so that students are expected to be motivated to do teaching and learning activities [11]. Learning styles of learning are intrinsic motivation, teachers and schools are required to nurture, safeguard, always give positive attitude encouragement, provide comfortable environmental conditions for more meaningful learning outcomes. The kinesthetic learning style is better when applied with the inquiry method.

4. Conclusion

Based on the research that has been done we can conclude that the precise inquiry method is used as an alternative to effective learning methods for the application of the scientific approach to the 2013 curriculum at the level of Senior High School with various students' learning modalities. In addition, Inquiry with kinesthetic modalities has the best effect in tackling student learning outcomes.

5. References

- [1] Wenning C J 2012 Levels of Inquiry: Hierarchies of Pedagogical Practices and Inquiry Processes *J. of Physic Teacher Education* **2**(3) pp 3-12
- [2] Kemendikbud 2015 *Materi Pelatihan Implementasi Kurikulum 2013* (Jakarta: Kementerian Pendidikan dan Kebudayaan)
- [3] DePorter B and Hernacki M 2006 *Quantum Learning: Membiasakan Belajar Nyaman & Menyenangkan* (Bandung: PT.Mizah Pustaka)
- [4] Agustini R 2013 *Efektifitas Pembelajaran Biologi dengan Pendekatan Inkuiri Terbimbing Berbantuan Media Animasi Digital terhadap motivasi dan Hasil Belajar Siswa* (Malang: PPS Pendidikan Biologi -Universitas Negeri Malang)
- [5] Tuckman B W 2012 *Conducting Educational Research (Sixth Edition)* (New York: Harcourt Brace Jovanovich)
- [6] Maxwell D O 2015 Effects of Using Inquiry-Based Learning on Science Achievement for Fifth-Grade Students *J. Asia-Pacific Forum on Science Learning and Teaching* **16**(1)

- [7] Banerjee A 2010 Teaching Science Using Guided Inquiry as the Central Theme: A Professional Development Model for High School Science Teachers *J. of Science Educator* **19**(2) 1-9
- [8] Pentecost T C and Scott P 2013 From Verification to Guided Inquiry: What Happens When a Chemistry Laboratory Curriculum Changes? *J. of College Science Teaching* **42**(3) 8388
- [9] Kulthau C C and Maniothes 2007 *Guided Inquiry: Learning in the 21 St Century School* (London: Libraries Unlimited)
- [10] Suyono and Harianto 2011 *Belajar dan Pembelajaran* (Bandung: Remaja Rosdakarya)
- [11] Arends R I 2007 *Learning to Teach Seventh Edition* (New York: Mc. Graw Hill)

Acknowledgments

A class division in the same department at a SMA Yadika Bangil should pay attention to the student's learning modality, in an effort to create a comfortable and enjoyable environment in the learning process.

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