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Discovery Learning Model with Ethnopedagogy Approach in Improving Students' Comprehension Ability

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Abstract: This research objective is to analyze a validity of device and effectiveness of learning discovery learning with ethno pedagogy approaches to improve learners' understanding concepts. Kinds of this research is quantitative approach by applying quasi experimental designs. While this research population was VI grade learners of SD Dewi Sartika Cluster, Annual District, Jawa Tengah. The results of the analysis of students' conceptual understanding abilities show that there are differences in the improvement in classes that apply the Discovery Learning learning model with an ethnopedagogical approach. The average increase in the N-Gain understanding of students' concepts in the pretest and posttest in the experimental class was 0.54 while the control class was 0.36. The application of Discovery Learning with an ethnopedagogical approach can be concluded to further improve students' understanding of concepts. The learning delivered becomes interesting with the involvement of students in learning. In addition, the application of Discovery Learning with an ethnopedagogical approach is able to make the learning process more active and fun. This study can be concluded that learning Discovery Learning with an ethnopedagogical approach in improving students' understanding of concepts is valid and effective. The results of this study can be used as information material to pay attention to the appropriate learning model for learning nuanced with local wisdom.

Keyword: Discovery Learning, Ethnopedagogy, Students' Comprehension Ability

INTRODUCTION

One of the goals of science is to gain an experience and understanding, that's why in elementary school students are introduced to various experiences and understandings of the culture around them, so that they can prepare for life in the future. Lack of experience and understanding of students makes learning not optimal. This has become an important role for teachers as professional educators because their main task is to educate, teach, guide, direct, train, assess, and evaluate students in early childhood education through formal education, basic education, and secondary education (Law Number 14 of 2005).). Therefore, teachers must be able to develop various media, methods, strategies, approaches and innovative learning models to build realistic understanding through student experience and interaction. However, in developing it we must first know the characteristics and compatibility between the innovations that we will do with the problems faced during learning at school.

Based on pre-research observations of 3 Public Elementary Schools in Jepara Regency in learning activities, learners had difficulty to comprehend concepts in the thematic learning, one of which is on the theme "Various Jobs". There are 70% of students in the class who have difficulty in describing their thoughts, ideas, and ideas. The results of the preliminary study of various class IV jobs with the following questions; Describe the economic activities suitable for rural communities! Of the questions, 30% of the students have not been able to do and complete the questions correctly, 40% of the students can only name the 3 types of work in the village correctly, 30% of the students can solve the questions correctly. Here are the results of the student's work in Figure 1.
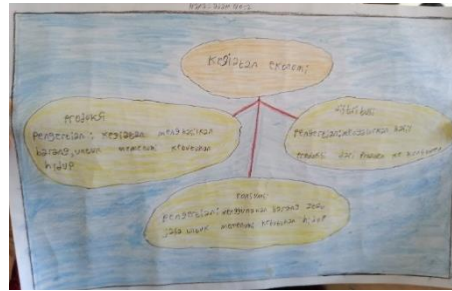

Figure 1. Student Worksheet A

It can be seen in Figure 1. that Student A has been able to explain his thoughts, students write what is known and what is asked, then Student A interprets his ideas but Student A has not been able to solve the problem because the excuses for economic activities in the plain area are not given conclusions. Learning using the discovery model learners could find new things, the process of finding new things requires creativity, so that with this Discovery Learning models and syntax. It can expand learners' creative thinking. (Rudiyanto, 2016). Carrying pedagogy in thematic learning, students can get to know local wisdom around students, students understand the content of the material presented in thematic learning using local wisdom content, students also find ideals in the future related to the type of work they are aiming for, one of which is to become a brass entrepreneur and become a batik maker. (Oktavianti & Ratnasari, 2018) Therefore, by applying the ethnopedagogy approach, it is alleged that it can help students easily understand the concepts or values of their local wisdom (Yusrizal, 2020). With the strengthening of the values of local wisdom, students feel proud of a local wisdom in their areas.

From those phenomenon, the decline in students' ability in knowledge and skills is due to several factors. One of the causes is learning model applied. Discovery learning could support learning mostly through their own active involvement with the principle and concepts. Teachers encouraged learners to have experiences that allow discovering principles for themselves (Hosnan, 2014). Whereas students are less active when the teacher asks to find concepts and skills that allow to have a meaningful learning experience.

Discovery learning is a model to increase active learner learning method by finding themselves, investigating for themselves, next results acquired are having long memory power, will not be easily forgotten by learners. Application on discovery learning models objectives to enable learners to understand materials as well as possible so that learning felt more meaningful and able to increase learners outcomes especially in learning process. It is because discovery learning models used direct activity and experience so that it will attract

attention of learners more and allow formation of abstract concept that having meaning. Then, activities are more realistic. (Illahi, 2012). This Discovery Learning model focuses on mental and physical abilities of students who will strengthen their enthusiasm and concentration in carrying out learning activities.

The ethnopedagogy approach in practical education emphasizes the importance of humanitarian relations, especially the emotional relationships among educators and learners. The emotional connection should be naturally intertwined, not fabricated and engineered. This is what causes the context of pedagogy to influence culture or vice versa culture to influence pedagogy, so that ethnopedagogy reaches its momentum, that is, to build cultured human civilization through cultivation. With the actions of students in finding something independently utilizing Discovery Learning, learners were able to form humanitarian and emotional relationships by themselves. This is because direct experience will have an impact on the strength of students' memories of the culture around them. Setyaningrum (2019) stated that the scores of students who did not reach KKM were caused because evaluation questions presented were not oriented in developing learners' critical thinking abilities. Learners were not trained in developing critical thinking skills. So, learners paid less attention to solve problems given by teachers. When in learning, students pay less attention to materials presented by their teachers. So, they had difficulty in doing practice questions, they were only able to solve problems that are directly applying formulas, if there are problems that require more reasoning students have difficulty solving them

According to background above, formulation of research are: (1) Analyzing a validity of Discovery Learning tools with ethno pedagogy approaches to increase students' understanding of concepts, (2) Analyzing an effectiveness of Discovery Learning with ethno pedagogy approaches to expand learners' comprehending concepts.

METHOD

A research design in this research is quantitative models in the pattern of quasi experimental design. As a material for sampling, this study took the population of fourth grade students in the Dewi Sartika Elementary School, Tahunan District, Central Java Province Regency, consisting of 12 schools, namely SDN 1 Langon, SDN 2 Langon, SDN 3 Langon, SDN 1 Sukodono, SDN 2 Sukodono, SDN 3 Sukodono, SDN 1 Petekeyan, SDN 2 Petekeyan, SDN 1 Krapyak, SDN 2 Krapyak, SDN 3 Krapyak, and SDN 4 Krapyak. Technique sample used purposive sampling. Research samples were SDN 2 Langon as an experimental group given the Discovery Learning treatment with an Ethnopedagogy approach, while SDN 1 Sukodono as the control group was given the Discovery Learning treatment.

Data collection technique used is to use a concept understanding ability test, observation and documentation. Discovery Learning modes with by applying Ethnopedagogy approaches were said to be effective if each indicator of comprehending concepts had increased. Discovery Learning Model with the Ethnopedagogy Approach is said to be effective in this study if it meets the criteria of (1) The average comprehension ability of learners applying discovery learning models with Ethno pedagogy Approach is equal to the minimum completion criteria, which is an average of 0.25 standard deviations, (2) Comprehension ability   students using the Discovery Learning Model with an

Ethnopedagogy Approach achieve classical completion, that is, students who achieve learning completion more than or equal to 75%, (3) The average comprehension ability of students in the classroom who utilizing Discovery Learning by applying Ethnopedagogy Approach is better than average comprehension learners' abilities in the classroom by applying PBL learning models. (4) Proportion of completion of learners' comprehension abilities utilized Discovery Learning Model by applying Ethnopedagogy Approach is higher than proportion of students' algebraic thinking ability using the PBL model.

RESULT AND DISCUSSION

The lesson plan that the researcher did was that the teacher applied learning outside the classroom for students to explore local cultural arts in Jepara, namely the art of carving. During the learning activities outside the classroom, the teacher gives students an understanding of the ethnopedagogy in Jepara. When the teacher finishes providing an understanding of typical Jepara ethnopedagogy, students are invited to observe the various activities in the carving studio. During the observation process, students are expected to understand that carving is the local wisdom closest to them so that they are able to express themselves during the learning activities. Finally, students can understand that carving is not only local wisdom that must be preserved, but as a high-quality art work that can build the economy.

Furthermore, after the learning activities in the carving studio have been carried out, students are given several questions by the teacher with the theme of typical Jepara ethnopedagogy based on the learning activities that have been carried out in the carving studio. The results of the student's work become a benchmark for whether or not the application of the ethnopedagogical approach is effective in learning activities.

Before the final data analysis test is carrying out, pre-requisite tests of two sample is carrying out, they were normality and homogeneity test that could be seen in results of analysis of experimental class normality test could be seen in Table 1.

Table .1 Normality Test Results Value

Normality Test	Significance	$a = 0,05$	Criterion	Conclusion
Experimental Class	0,327	0,05	H_0 accepted	Normal
Control Class	0,381	0,05	H_0 accepted	Normal

From table above, results of normality tests with an application of Discovery Learning with Ethno pedagogy approaches and class with an application of Discovery Learning is more than value so that it could be asserted that a (sign.> 0,05) data is distributed normally. Furthermore, homogeneity tests could be seen in Table below.

Table .2 Results of Homogeneity Test of Posttest Concepts Understanding

Normality Test	Significance	$a = 0,05$	Criterion	Conclusion

ConceptUnderstanding (Experimental Class)				
ConceptUnderstanding (Control Class)	0,426	0,05	H_0 accepted	Homogeneous

Based on table above, value of the results of class homogeneity tests with application of Discovery Learning with Ethno pedagogy approaches and class with an application of Discovery Learning is more than value so that it could be asserted that data have homogeneous variances. (sign.> 0,05)

Differences in improving students' conceptual understanding, experimental classes that using discovery learning with ethno pedagogy approaches. Differences were formulated by applying independent sample t-tests. Differences in improvement of concept comprehension tests, first seeking increase in learners' comprehending of concepts using N- Gain from pretest and posttest results from experimental classes and control classes as presented in Table 3.

Table .3 Results of Improved Concepts Understanding

	Experimental			Control		
	Pretest	Posttest	N-Gain	Pretest	Posttest	N-Gain
Average	65,17	83,92	0,54	61,46	75,41	0,36

Based on table above, it showed average increase in N-Gain of learners' concepts comprehending in pretest and posttest in experimental class was 0.54 while control class was 0,36. That could be asserted that there were the differences in learners' comprehending of the concept between experimental class that applying discovery Discovery Learning with an Ethnopedagogy approaches and control class that applying discovery learning.

Furthermore, the test of significant differences between classes that apply Discovery Learning with an Ethno pedagogy approach and those that apply Discovery Learning utilized independent sample t- test by using SPSS program. In this calculation, N- Gain value of experimental class is acquired an control class has sig. (2-tailed) by 0.00 < 0.05. That in the decision making on the independent test sample t-test, if the value of significance or sig.(2-tailed) < 0.05.

In addition to identify differences in improving concept understanding ability between experimental classes and control classes, researchers can also find out the magnitude of concept comprehension skills of each indicator. The results of the achievement of each indicator of concept comprehension ability are presented in Table 4.

Table 4.Achievement of each Concept Understanding Indicator

No	Indicator	Class Experiment	ClassControl
1.	Reproducing a concept	87%	71%
2.	Classifying objects by the concept	88%	80%
3.	presenting examples and not example of concepts	89%	75%

4.	Giving concepts in several patterns of representation	84%	79%
5.	Developing a sufficient condition of concepts	84%	73%
6.	Using, utilizing and selecting operations	87%	80%
7.	Applying concepts to solve problems	87%	77%
	Average	87%	76%

From table above, that is known that experimental class obtained an average percentage of each indicator of 87% while in the control class it obtained a percentage of 76%. The first indicator is to re-state a concept, from the calculation results in the experimental class obtained a percentage of indicators of 87% while in the control class obtained a percentage of 71%. The second indicator is to classify objects based on concepts, from the calculation results in the experimental class obtained a percentage of indicators of 88%. Whereas, in control class acquired a percentage of 70%. The third indicator is to present example and not example of concepts, from the calculation results in the experimental class obtained a percentage of indicators of 89%, while in the control class obtained a percentage of 75%. The fourth indicator is to provide concepts in several representation pattern, from calculation results in the experimental class obtained a percentage of indicators of 84%, while the calculation results in the control class obtained a percentage of 79%. The fifth indicator is to increase sufficient condition of concepts, from the calculation results in the experimental class obtained a percentage of indicators of 84%, while in the control class obtained a percentage of 73%. The sixth indicator is to utilize, apply and select certain operations, from the calculation results in the experimental class obtained a percentage of indicators of 87%, while in the control class obtained a percentage of 80%. The seventh indicator is to apply concepts to problem solving, from the calculation results in the experimental class obtained a percentage score of 87%, while in the control class obtained a percentage of 77%.

Average increase in N- Gain of learners' concept comprehending in pretest and posttest in experimental class was 0.54, while in control class was 0.36. from those results, all could be asserted there is differences to comprehend of learners' concepts those who apply Discovery Learning and the Ethnopedagogy approach and those who apply Discovery Learning. According to results of N-Gain, that showed increasing in the understanding concepts in the class that applying Discovery Learning with an Ethnopedagogy approach is higher than learning that applies Discovery Learning.

From those results, we knew that there are differences in improving understanding of the concept of experimental class students who apply Discovery Learning with the Ethnopedagogy approach with the control class that applies Discovery Learning. It is in the accordance with research that accomplished by Zulkifli & Tetty (2018). He said that mathematics learning by utilizing manipulative props has a positive impact on learning achievement and mastery of subject matter as evidenced by the increase in students' mathematics lesson scores. This means that there needs to be a carrying capacity to maximize the learning process. This research utilizes manipulative props that can arouse students' enthusiasm in learning. Na'im, Sopyan, & Linuwih (2015) stated that there are several differences in improving learning outcomes in the experimental class that using

Discovery Learning according to scientific approach with control classes that use conventional learning.

In application process of Discovery Learning with Ethnopedagogy approaches, it is able to provide a student learning experience. The implementation of Discovery Learning activities with an Ethnopedagogy approach is first asked to find the answers to the problems given, then the teacher divides the students into groups. During all learners' discussions, the teacher distributes the LKS that the students must do. Then the teacher gives treatment with an Ethnopedagogy approach in each group. Teachers provide guidance if students experience difficulties. Through LKS students are directed to solve problems regarding the culture in their surrounding environment by proving directly with the Ethnopedagogy approach.

The Ethnopedagogy approach contributes to improving comprehending concepts, that is in a line with results of study that finished by Haloho, Prambudi, & Hidayah (2019) Discovery Learning is as a learning model that can be applied to teach mathematics to students. Its application can be supported through various alternative media, such as Manipulative Props (APM). Through the learning process with the help of manipulative props, the learning process does become more efficient and creates a more productive learning environment.

Learners were asked to provide results of their discussions in front of class. This is done to find out whether the student's answer is correct, if it is not correct, the teacher would set record straight. It turns out that by using the Ethnopedagogy approach understanding concepts of students increasing. This results is in a line with the study by Setyaningrum, Hendikawati, & Nugroho (2019) application of Discovery Learning can increase understanding of concepts and student cooperation. In experimental class, judging from answer results, they are able to give ideas smoothly. Able to answer the questions given by the teacher well. They were also able to present a variety of answers according to the existing problems. Meanwhile, in control class, comprehending of mathematical concept is low due to absence of supporting facility, like manipulative props. This is in line with the results of Kania's research (2018) understanding the concept of students who get mathematics learning using manipulative objects is better than comprehending concepts of learners who getting mathematics by using conventional learning. Students are positive about learning mathematics by using manipulative objects for reasons, among others, learning mathematics using manipulative objects can encourage them to be more active and directly involved in learning, more excited and cause feelings of pleasure, and they become more familiar with the concepts learned because of the results of discovering themselves, gaining knowledge and new experiences so that insights become wider.

This is also supported by achievement of each indicator that available on both control and experimental class. Experimental class has average of 87% was classified into very high categories. Whereas, control class acquired average of 76% classified into the high category. Re-stating a concept is proven by the student in completing the test given by the teacher by writing down what is known, asked, and answered. The indicator reiterates a concept in the experimental class that has a score percentage of 87% classified into the very high category, while the control class has a percentage score of 71% classified into the high category. Classifying objects by concept belongs to a very high category. Students can complete the test by classifying according to the elements of the local culture in detail. The

indicator of classifying objects by concept has a percentage score of 88%, while control class has percentage of 80% belonging to high category. Learners able to give examples and not examples of a concept accompanied by a complete explanation. Indicator presented example and not example of concepts in the experimental class having a score percentage of 89% classified into the very high category, while the control class has a percentage score of 75% classified into the high category. Students are able to provide concepts in several patterns of representation as evidenced by the variety of ways of solving LKS problems. Indicator presented concepts in several patterns of representation in the experimental class has a percentage score of 84% belonging to the very high category, while in the control class it has a percentage score of 79% belonging to the high category. Indicator developed sufficient requirements for the concepts in experimental class to have percentage of 84% classified into the very high category, while in the control class a percentage score of 73% is classified into the high category.

Learners were able to utilize concepts of local wisdom based on requirements in completing tests. Indicators applying, utilizing then selecting certain operations in the experimental class a percentage score of 87% falls into the very high category, while in the control class it has a percentage score of 80% falling into the high category. Students can solve story questions based on problems in everyday life. The indicator of applying the concept to problem solving in the experimental class the percentage of a score of 87% is classified into the very high category, while in the control class it has a percentage of a score of 76% classified into the high category.

The application of Discovery Learning with an Ethnopedagogy approach can increase student activity in the classroom, namely by presenting the results of their group discussions. The teacher acts as a facilitator if students experience difficulties. Measuring results of learners' comprehending concepts, teacher could present an evaluation of the test. So, results of learners' concept comprehending test had been achieved. In accordance with research conducted by Maharani, Hartono, & Hiltrimartin (2013) students' concept understanding ability can be seen from the test results. A realistic problem is applied as a source for emergence of formal knowledge of mathematical that would be encouraging problem-solving activity, searching for problems then organizing subject matter (Fahrudin, Zuliana, & Bintoro, 2018).

According Eggen and Kauchak (2012) that learning models must be supported by theories and research on learning and motivation. The application of Discovery Learning with an Ethnopedagogy approach could be asserted to further expand learners' comprehending concepts. The effect of the learning model that is made because it is in accordance with what they experience and get in daily activity, especially related to traditions, customs and patterns of community life (Setiawan, 2018),Learning delivered interesting with involvement of learners in learning process. In addition, the application of Discovery Learning with an Ethnopedagogy approach is able to make the learning process more active and enjoyable.

CONCLUSION

According to results and discussion about influence of Discovery Learning with the Ethnopedagogy approach on the understanding of elementary school students' concepts. That could be asserted: Discovery Learning device by applying Ethnopedagogy approach

in improving the understanding of valid student concepts. Learning Discovery Learning with Ethnopedagogy approaches to improve learners' comprehending concepts is an effective because there were the differences to expand understanding concepts in a classroom that applying Discovery Learning with the Ethnopedagogy approach.

Then, suggestion for next researches is that Discovery Learning with Ethnopedagogy approaches could increase learner' comprehending concepts. Whereas, learning models could be applied as alternative especially in learning activities. The learning process that uses an ethnopedagogical approach is more often applied, so that student activity increases because students get a learning atmosphere that is not monotonous. The results of this study can be used as an information material to pay attention to the appropriate learning model for learning nuanced with local wisdom.

REFERENCES

Arikunto, S. 2010. *Prosedur Penelitian: Suatu Pendekatan Praktik.* Jakarta: PT Rineka Cipta.

Eggen, P. & Kauchak, D. (2012). Strategies and Models for Teachers. 6th Edition. Boston: Pearson Inc

Fahrudin, A. G., Zuliana, E., & Bintoro, H. S. (2018). Peningkatan Pemahaman Konsep Matematika melalui Realistic Mathematic Education Berbantu Alat Peraga Bongpas. *ANARGYA: Jurnal Ilmiah Pendidikan Matematika*, 1(1), 14-20.

Haloho, S. H., Prambudi, A., & Hidayah, I. (2019). Meningkatkan Pemahaman Konsep Operasi Hitung Bilangan Pecahan Siswa Kelas VII SMPN 22 Semarang melalui Pembelajaran Discovery Learning Berbantuan APM. *In PRISMA, Prosiding Seminar Nasional Matematika*. Vol. 2, pp. 821-827.

Hosnan. (2014). Pendekatan Saintifik dan Kontekstual dalam Pembelajaran Abad 21. Bogor : Ghalia Indonesia.

Illahi, Mohammad Takdir. (2012). Pembelajaran Discovery Strategy dan Mental Vocational Skill. Jogjakarta: Diva Press.

Kania, Nia. (2018). Alat Peraga untuk Memahami Konsep Pecahan. Jurnal THEOREMS (The Original Research of Mathematics) Vol. 2 No. 2, Januari 2018 hal. 1-12

Maharani, L., Hartono, Y., & Hiltrimartin, C. (2013). Kemampuan Pemahaman Konsep Siswa pada Pembelajaran Matematika menggunakan Model Generative Learning di Kelas VIII SMP Negeri 6 Palembang. *Jurnal Pendidikan Matematika*, 7(2), 1-16.

Moleong, L. J. 2016. *Metode Penelitian Kualitatif Edisi Revisi.* Bandung : PT. Remaja Rosdakarya

Na'im A., Sopyan, A., & Linuwih, S. (2015). Implementasi Model Discovery-Inquiry Berbasis Pendekatan Scientific pada Pembelajaran IPA di Kelas V Sekolah Dasar. *Journal of Primary Education*, 4(2), 104-111.

Oktaviani & Ratnasari. 2018. Etnopedagogi dalam Pembelajaran di Sekolah Dasar Melalui Media Berbasis Kearifan Lokal. 8(2): halaman 150-154.

Oktavianti, I., & Ratnasari, Y. 2018. Etnopedagogi dalam Pembelajaran di Sekolah Dasar Melalui Media Berbasis Kearifan Lokal. *Refleksi Edukatika: Jurnal Ilmiah Kependidikan*, *8*(2)

Rudiyanto, Heru. (2016). Kajian Good Manufacturing Practice (GMP) dan Kualitas Mutu pada Wingko Berdasarkan SNI-01-4311-1996. *Jurnal Kesehatan Lingkungan* Vol. 8 No. 2.

Setiawan, I.K. (2018). Integrasi Etnopedagogi dalam Mengembangkan Model Pembelajaran Biologi, Jurnal Konseling dan Pendidikan ISSN Cetak: 2337-6740 - ISSN Online: 2337-6880 DOI: https://doi.org/10.29210/119200 http://jurnal.konselingindonesia.com Volume 6 Nomor 1, 2018, Hlm 15-24

Setyaningrum D.H., Purnomo D, & Prasetyowati D. (2019). Efektivitas Pembelajaran Matematika dengan Model Discovery Learning dan Think Pair Share Berbantu Smart Sticker terhadap Kemampuan Berpikir Kritis. *Imajiner: Jurnal Matematika dan Pendidikan Matematika*, 1(6).

Sugiyono. 2010. *Metode Penelitian Pendidikan*. Bandung: CV. Alfabeta.

Sugiyono. 2015. *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.

Sukestiyarno, Y.L. 2014. *Statistika Dasar*. Semarang: C.V Andi Offset

Yusrizal, Y. (2020). Pengaruh Pendekatan Etnopedagogi dan Motivasi Belajar Terhadap Hasil Belajar IPS Siswa di SD Negeri Panton Luas Baru. Jurnal Ilmiah Maksitek, 5(3), 84–92

Zulkifli, S., & Tetty, K. A. (2018). Alat peraga benda manipulatif untuk meningkatkan pemahaman konsep pecahan pada mata pelajaran matematika. *Jassi Anakku*, 18(2), 25-31.