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Improving Students' Entrepreneurship Interests and Concept Understanding Through the Ethnoscience-Based PBL-Networked Model

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Abstract: This study aim to determine the effect of the implementation of the ethnoscience-based PBL-Networked model on students' understanding of the concept and interest in entrepreneurship. The research was conducted using a quasi-experimental approach with nonequivalent control group design. The research subjects were class VII students of SMPN 4 Sungai penuh. Determination of the sample used purposive sampling technique. The data were obtained from the results of the pretest and posttest as well as the student interest in entrepreneurship questionnaire. The instrument is used after being validated by a team of experts. Based on data analysis, that the implementation of the ethnoscience-based Problem Based Learning learning model has an influence on students' understanding of concepts and interest in entrepreneurship. Ethnoscience-based PBL-Networked model learning tools are effective in significantly increasing students' understanding of concepts and interest in entrepreneurship. The effect on students' understanding of concepts and interest in entrepreneurship is higher in the implementation of the ethnoscience-based PBL-Networked model than in conventional classes. This is based on the results of the One way MANOVA test showing a significance value of 0.000 which is less than the significance level α= 0.005, so it can be concluded that there is an average difference in increasing understanding of concepts and students' interest in entrepreneurship that is significant between students who learn using the ethnoscience-based PBL-Networked learning model and students who use learning tools that are already available on the Merdeka Belajar Platform.

Keywords: PBL; Networked; Ethnoscience; Concept understanding; Entrepreneurship.

Introduction

The purpose of integrating entrepreneurship into the learning process is to respond to the challenges of 21st century learning with the characteristics of 4C and the addition of 2C to 6C (Creative, Critical thinking, Collaboration, Communication, Compassion and Computational Thinking). Entrepreneurship integration can be carried out through a learning process that leads students to have life skills that are relevant to the development of science and technology in the global era so that the knowledge gained by students becomes more meaningful independently or in groups (Purusottama & Trilaksono, 2019; Sa'adah et al., 2021).

According to Amin et al., (2020), a sustainable economy can be achieved by cultivating interest in entrepreneurship from an early age among the community. Entrepreneurial interest or entrepreneurship in social life can be raised early on in students (Yanti & Mauliza, 2021; Permana et al., 2021). Entrepreneurial-oriented education is an educational process that applies principles and methodologies that direct the formation of students' life skills through an integrated curriculum developed in schools (Kemendikbud, 2010). To instill entrepreneurial values in students in schools, there are several things that can be done, namely improving the curriculum, increasing the role of schools in preparing entrepreneurs, improving the organization of the learning process and improving teachers themselves (Supardi et al., 2022).

Entrepreneurship-oriented education can be applied one way with integrated learning of local

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wisdom. Through education based on local wisdom, students can be optimistic about the creation of education that is able to give meaning to the lives of students, because they can learn from concrete direct experience in everyday life (Sumardjoko, 2018; Rusmansyah et al., 2023). In other words, the role of local wisdom in learning is as a liaison from something concrete to something abstract (Wahyudiati & Qurniati, 2023). In addition, local potential can be integrated into educational activities, one of which is aimed at preserving local culture and potential in an area (Dewi et al., 2019 & Tohri et al., 2022).

From Permendikbud No. 81 A concerning Curriculum Implementation, integrating local wisdom into the curriculum can be implemented in certain subjects or stand alone as local content subjects (Kemendikbud RI, 2014). Local wisdom is part of the culture or characteristic of a particular area that contains cultural values, and also developments in that area from generation to generation (Zahro et al., 2019; Wahyudiati & Qurniati, 2023). The integration of indigenous knowledge with scientific knowledge is called ethnoscience. A form of indigenous knowledge that can be linked to scientific concepts, namely local wisdom.

Natural Sciences (IPA) subjects are very relevant for implementing local wisdom integrated learning because science learning examines natural phenomena that cannot be separated from everyday life (Mukminin & Kurniawan, 2020 & Suprapto et al., 2021). One of the natural science materials that can be related to local wisdom is the material of Substances and Their Characteristics, in this material it is explained how the properties of a substance and how the changes can be related to the local wisdom of the Kerinci area include, namely, making Dodol Kentang Kerinci, Lemang Kantong Semar, Air Serbuk Kawo, Kopi Nur Kerinci and Bantik Incung.

Integration of local wisdom can be implemented into learning using the Networked type integration model (network model). This learning model allows students to broaden their horizons by carrying out the process of integrating the topics studied through the selection of expert networks and resources. Teachers can direct students in integrating the material studied with real life situations through a network of experts that students are interested in (Priscylio & Anwar, 2019). The Networked type integration model is structured in combining learning activities that rely on the possibility of applying concepts, forms of problem solving, or demands for new forms of skills after students carry out field studies in different situations, contexts or conditions. Learning is viewed as a process of reciprocal relations between understanding concepts and the reality faced by students (Yanti & Yusliani, 2020; Octaviani & Sholikhah, 2021). Through direct observation of the application of science concepts in real life that are very familiar with their lives, it is hoped that they can stimulate students to innovate and foster an interest in entrepreneurship within them (Aqil et al., 2019; Syahidi, 2022).

The integration of the local wisdom of the Kerinci area into science learning needs to be directed towards student learning outcomes as a whole in line with the nature of science, namely students who have scientific skills, knowledge and attitudes and can apply them to everyday life. To meet these learning demands a teacher can incorporate problem solving skills into the learning process which is called problem based learning (PBL) (Susbiyanto et al., 2019). (Akhdinirwanto et al., 2020) states that problem solving skills will shape character, as well as encourage students to actively find solutions to the problems given.

The local wisdom of the Kerinci area which is integrated into science learning is not only related to students' science activities and cognitive achievements, but also related to social activities. So that in integrated science learning not only the learning outcomes in accordance with the nature of science are obtained but also good knowledge and social attitudes (Sari et al., 2020 & Lia, 2022). This is in line with the objectives of integrated science learning, one of which aims to help students appreciate the need to contribute to sustainable development (Wilujeng, 2018; Augustine, 2020). Increasing science learning outcomes and their integration with social values can be applied to learning through learning tools without neglecting the learning outcomes contained in the curriculum published by the Ministry of Education and Culture of the Republic of Indonesia (Atmojo, 2018; Mahyuny, 2022). Learning devices are a collection of supporting media in learning activities that are used to achieve learning objectives. The quality of the learning device that is arranged will determine the quality of the stages of the learning activity (Asmar & Suryadarma, 2021). Therefore, to build good quality stages of learning activities, the set of background activities needs to be structured appropriately, which is in line with the scope of the material and the needs of students (Harjono et al., 2019; Mallipa & Murianty, 2022).

From the results of interviews with several science teachers at SMP Negeri 4 Sungai Penuh, it is known that students' interest in entrepreneurship is still low. Learning that is carried out only focuses on efforts to master student material, it has not been carried out by integrating entrepreneurship values.

The obstacle in learning that integrates entrepreneurship interest is the lack of literacy about entrepreneurship values which is provided to teachers to develop integrated entrepreneurship learning. Another reason is that schools do not yet have teaching materials that facilitate the growth and development of entrepreneurship education. Through interviews it was

also found that at the learning stage the teacher had not connected the concepts of science learning materials with local wisdom, as well as the learning tools used are not based on the local wisdom of the Kerinci area. Learning activity tools that have not been linked to Kerinci local wisdom include lesson plans for each meeting, teaching materials in the form of printed books, assessment instruments and student worksheet.

Based on the review of student assessment documents, it is known that student learning outcomes are still relatively low with a percentage of 60% of students having not reached the minimum criteria of mastery learning in the semester exams. The student achievement in science learning which is still relatively low shows that the process of learning science in schools has not produced significant results in practicing science mastery and needs to be improved. The student achievement in science learning which is still relatively low shows that the process of learning science in schools has not produced significant results in practicing science mastery and needs to be improved (Arafah et al., 2023). Given the importance of instilling an interest in entrepreneurship from an early age in students, researchers are interested in carrying out research in an effort to provide solutions, namely by implementing the Ethnoscience-Based PBL-Networked model to Increase Concept Understanding and Student Entrepreneurship Interests.

Method

The method used in this study was a quasi-experimental method with a nonequivalent control group design.

Table 1. Research Design

Class	Pretest	Treatment	Posttest
Control	K1	X	K2
Experiment	K1	Y	K2

Remark:
K1 : Initial ability of students
K2 : Student's final ability
X : Conventional learning
Y : Ethnoscience-Based PBL-Networked Learning Model

The subjects of this study were all class VII students of SMPN 4 Sungai Penuh for the 2022/2023 academic year. Determination of the sample using purposive sampling technique. The data were obtained from pretest and posttest scores as well as questionnaires on students' critical thinking skills. The instrument is used after being validated by a team of experts. This study uses data analysis, namely the normality test, homogeneity, N-Gain, and the MANOVA test.

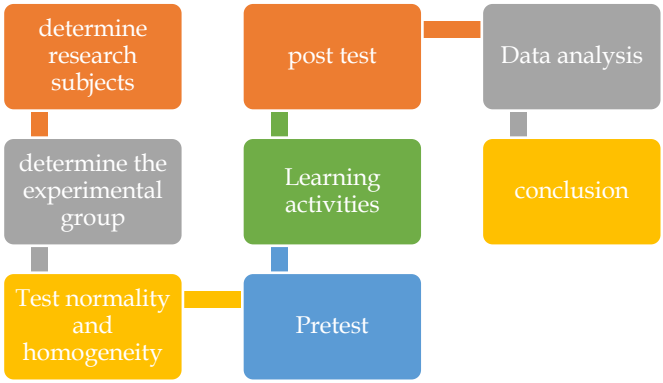

Figure 1. Steps of reseach prosess

Result and Discussion

The first stage of this research was carried out by collecting data through interviews and observations to identify existing problems in schools and as a basis for estimating solutions to problems encountered. At the analysis stage, learning analysis, behavior analysis and student characteristics have been carried out.

Figure. 2. Interviews with science teacher

Based on the results of the analysis, it was found that students needed learning tools that were interesting and helped students understand the material and its characteristics. There are still many students who do not understand the substance material and its characteristics and have difficulty identifying changes that occur in substances, as well as difficulties in distinguishing physical changes from chemical changes. Based on the results of interviews the teacher has never measured students' interest in entrepreneurship which should need to be improved so that students have life skills that can help them in everyday life. Students need learning tools that are interesting and help students understand material and its characteristics and can assist them in connecting scientific knowledge with knowledge

obtained in their daily lives. In general, students like learning outside the classroom and already understand ethnoscience in their environment.

As a determinant of the conceptual feasibility of the learning tools used in this study, an expert review process was carried out by material experts and learning design experts. Suggestions and comments from the validator are used as material for revising and improving the Ethnoscience-based PBL-Networked learning tool in substance material and its changes to increase students' understanding of concepts and interest in entrepreneurship. The following are the results of the validation of material experts and learning design experts.

Table 2. Validation results by experts

Validators	Score (%)	Category
ExpertMaterial	96	Very worth it
Learning design expert	96	Very worth it

Material validation was carried out twice. At the first validation stage, a score of 60 was obtained with a percentage of 89.3% included in the feasible category. There are several suggestions and inputs that must be made, namely the need to add indicator points that are application of the material concept to be adapted to the PBL model. Furthermore, it is necessary to highlight the ethnoscientic aspects on the assessment sheet. After being revised, at the final validation stage a score of 72 was obtained with a percentage of 96% and was included in the very feasible category.

Learning design validation was carried out three times. In the first validation stage, a score of 86 was obtained with a percentage of 80.15% included in the feasible category. There are several suggestions and inputs that must be made, namely the integration of the PBL-Networked model that is used should enter into all sections from the material to the activities. The goal is that the character of entrepreneurship can be integrated into learning. After being revised, at the final validation stage a score of 97 was obtained with a percentage of 96% and included in the very feasible category. This shows that learning tools based on PBL-Networked materials and their changes are appropriate for use in research activities to measure the effectiveness of learning tools.

The effectiveness of learning tools is measured using the learning outcomes of students before and after using the ethnoscience-based PBL-Networked model of learning materials on substances and their changes as well.

Figure 3. Daily test

Learning outcomes (cognitive, affective and psychomotor) that can be used to see whether there is an influence or not from the use of the Ethnoscience-based PBL-Networked learning model on the subject matter and its changes which are developed using the instrument of learning achievement test questions.

Table 3. Student pretest and posttest data

Aspect	Pretest	Post test	N-Gains
Concept understanding	51.60	76.66	0.51
Entrepreneurial interest	43.33	57.16	0.39

The results of the analysis of student learning outcomes show that there is an average difference between the pretest and posttest. This means that there is an effect of the use of ethnoscience-based PBL-Networked model learning tools on substance material and its changes in improving learning outcomes. This is in line with research conducted by (Sudarmin et al., 2019; Pridayanti & Alyani, 2022 & Wajdi et al., 2022) which states that the use of the PBL model can improve students' understanding of concepts because students are encouraged to be more active in learning so that learning becomes more meaningful.

Ethnoscience-based PBL-Networked model learning device products on substance and its changes were developed to increase students' understanding of concepts and interest in entrepreneurship. Learning activities designed to utilize ethnoscience around the area where students live. Both models are used to train students' problem-solving skills and help students connect scientific knowledge with knowledge in everyday life through expert networks.

Based on the results of research that has been conducted by Ferdianto & Setiyani, (2018); Ramdani, (2018) & Rusmansyah et al., (2023), Through learning based on local wisdom, education will be created that is able to give meaning to students because they can learn concrete direct experiences in everyday life. Ahidinirwanto et al. (2020); Suryawati et al. (2020) &

Jumadi et al. (2021) also stated that the application of the PBL model can shape character through problem solving skills and encourage students to actively find solutions to given problems. In line with previous research the learning tools developed can encourage students to be more active so as to make the learning process more meaningful. Through the learning tools that have been developed, the teacher provides opportunities for students to find or build their own knowledge.

The effectiveness of the learning tools developed was measured by using the learning outcomes of students before and after using the Ethnoscience-based PBL-Networked model of learning materials on substance and its changes and by comparing the developed learning tools with existing learning tools. The learning outcomes (cognitive, affective and psychomotor) that can be used to see whether there is an influence or not from the use of the Ethnoscience-based PBL-Networked learning model on the subject matter and its changes are developed using the instrument of learning achievement tests. The results of the analysis show that there is an average difference between pretest and posttest learning outcomes.

The use of the PBL model combined with the Networked integration model is proven to be able to make students more active during learning, students look enthusiastic during learning because learning outside the classroom directly attracts students' attention.

Figure 4. Learning outside classroom

However, there are some students who seem to only see and do not try to dig up information from what is observed, this can be due to several things including students with introverted personalities who have difficulty communicating, this is as expressed by (Marnita et al., 2020; Artawan et al., 2022) in his research that children's learning styles are very important for teachers to pay attention to before implementing a learning model, students with introverted personalities will find it difficult to develop themselves in a new learning environment, therefore teachers need to make students feel familiar and feel valued.

The use of learning tools developed has been compared with learning tools that are already available from the Ministry of Education and Culture through the merdeka belajar platform. To see a comparison of the two learning devices the researcher used an inferential statistical test.This data can be known by conducting the MANOVA test. Before the MANOVA test was carried out, several prerequisite tests were carried out, namely the homogeneity and normality tests of the data.

Univariate normality testing was carried out using Kolmogorov Smirnov and Shapiro Wilk. The data is called normal if the probability or $p > 0.05$. Univarite normality test results are presented in the following table.

Table 4. Normality Test Results for Understanding Concepts and Entrepreneurial Interests

Variable	Class	Kolmogorov Smirnov Sig.	Shapiro Wilk Sig.
Concept	Control	0.200	0.712
Understanding	Experiment	0.150	0.192
Entrepreneurial	Control	0.200	0.090
interest	Experiment	0.058	0.064

Based on the data in table 4. it can be seen that the value of sig. > 0.05 then the data is normally distributed. Homogeneity test was carried out with SPSS descriptive statisticsbased on the results of Levene's Test of Equality of Error Variances. If the sig. > 0.05 then the data is homogeneous. The results of the homogeneity test of understanding the concept and interest in entrepreneurship can be seen in the following table 5.

Table 5. Variable Homogeneity Test Results

	Variable	Levene Statistics	Sig.
Concept	Based on means	0.002	0.964
Understanding	Based on median	0.010	0.921
	Based on median and with adjusted df	0010	0.921
	Based on trimmed mean	0.002	0.966
Interest	Based on means	1.219	0.274
entrepreneurship	Based on median	1.004	0.321
	Based on median and with adjusted df	1.004	0.321
	Based on trimmed mean	1.235	0.271

The results of testing the understanding of the concept and interest in entrepreneurship it is known that the significance level values based on the mean, median, median and adjusted df, and trimmed mean all show a value greater than 0.05. Thus, it can be concluded that both classes have a homogeneous variant score of understanding the concept and interest in entrepreneurship.

After the prerequisite test is met, it is continued with the MANOVA test which aims totested the research hypothesis which consisted of testing the difference and increasing the ability to understand concepts and students' interest in entrepreneurship in the experimental class who took part in learning using the Ethnoscience-based PBL-Networked model of learning and who took part in learning tools from the independent learning platform. The MANOVA test results show that there is a difference between one independent variable and another independent variable if the significance is less than 0.05.

Table 6. Multivariate Test Results on the MANOVA Test

Effects	Sig
Pillai's Trace	0.000
Wilks' Lambda	0.000
Hotellling's Trace	0.000
Roy's Largest Root	0.000

Based on the multivariate test, a significance value of 0.000 was obtained. Because the significance value is less than 0.05. In other words, there are collective differences between learning using ethnoscience-based PBL-Networked model learning tools and those taking learning devices from the independent learning platform, in terms of understanding concepts and student entrepreneurship interests.

Learning using the ethnoscience-based PBL-Networked model can encourage students to be more active so as to make the learning process more meaningful. Through learning tools that have been developed, teachers provide opportunities for students to discover or build their own knowledge. The ethnoscience-based PBL-Networked learning model product on substance and its changes that has been developed has several advantages and disadvantages. The advantages of the ethnoscience-based PBL-Networked learning model include being able to combine learning outside the classroom and in the classroom so as to help students who feel bored with learning in the classroom. Furthermore, this learning tool can train students to solve problems and is also able to facilitate students to gain knowledge through expert networks. The material being taught is related to the ethnoscience of the area around it. The goal is that the learning design developed is able to make students more active, innovative and independent in learning activities and able to preserve the local wisdom.

Conclusion

The conclusion of this study is that learning using the ethnoscience-based PBL-Networked learning model can increase students' interest in entrepreneurship and understanding of concepts as indicated by the average difference test using the MANOVA test obtained Sig. of 0.000 < (0.05). The interest in entrepreneurship and understanding of students' concepts using learning tools based on ethnoscience-based PBL-Network models is higher compared to students who use conventional learning tools available on the Merdeka Belajar platform.

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