P-ISSN: 2776-7329, E-ISSN: 2776-7310
Proceedings
5th Vocational Education International Conference
Semarang, 13 July 2023

The Influence of the Inquiry Model in the Practicum of Food Quality Evaluation Course on Student Learning Outcomes at SMK SMTI Makassar

Andi Sukainah*, Subariyanto, Nurmitra Eka Saputri

Department of Agricultural Technology Education, Faculty of Engineering, Makassar State University
**Corresponding author. Email: andi.sukainah@unm.ac.id*

ABSTRACT
This research is experimental research using a quasi-experimental design, which aims to determine student learning outcomes with the application of the inquiry model in practicum course for evaluation of food quality in class XI PMP SMK SMTI Makassar. The application of the inquiry model is the independent variable of the research, while student learning outcomes are the dependent variable. This study involved 113 students of class XI PMP SMK SMTI Makassar as a population and 24 students as a sample, with details of 12 students from the control class and 12 students from the experimental class. Data collection was carried out based on tests and forms of teacher and student observation. Data was analyzed with the t test. From the research results obtained data for the experimental class using the inquiry model has an average pretest of 61,67 and posttest of 87.08. Meanwhile, the students' average score for the control class pre-test was 55.00 and for the post-test was 82.50. The experimental class experienced an increase in the value of student learning outcomes which was greater than the control class. The N-gain value for the experimental class was 66.88%, higher than the control class's N-gain value (61.28%). It can be concluded that the inquiry model is a more effective learning model compared to the conventional model.

Keywords: *Inquiry models, Learning outcomes, Food quality testing.*

1. INTRODUCTION

Challenges always exist in the world of education. One of the causes of the low quality of education in Indonesia is the weak learning process. This is one of the problems in the world of education. Factors that support the success of learning in the classroom is the learning process. Good learning is focused to be student-centered *(Student centered)* [1]. One level or type of formal education unit that emphasizes the ability and self-development of students is vocational secondary education.

Vocational High School is a secondary education system that facilitates students to pursue a career according to their specialization or field of interest. One of the industrial technology-based vocational high schools (SMTI) is SMK SMTI Makassar. The learning process for SMK SMTI Makassar uses a block system.

The block system allows students to receive and follow learning material optimally and intact by grouping effective learning hours into summarized time units. The division of the block system at SMK-SMTI Makassar is one week of theoretical learning carried out in class and one week of practical learning carried out in the laboratory. Sometimes, students are not given the opportunity to conduct experiments, think critically, and voice their opinions in the teacher's teaching and learning methods and techniques. In fact, there are various models or techniques in a lesson that can be implemented to solve existing problems. The use of learning models and methods is not immediately used, but must also be adjusted so as to create maximum teaching effectiveness in the classroom.

The inquiry model is generally applied by explaining the purpose of the learning process on the basis of practicum activities. The inquiry model is a learning model that facilitates students in applying procedures and principles of critical thinking through inquiry activities or scientific and natural research. The inquiry model focuses more on how students learn (*student centered approach*) which emphasizes the individuality and intellectual development of students [2].

Generally, in teaching activities carried out in class, students and teachers usually have a question-and-answer relationship to seek and find solutions to problems through discussion activities. Observations, discussions, and experiments are ways to get and receive information. The main objective is to equip students with a thorough understanding of the theory given before doing practicum. Participating in practicum activities is an opportunity for students to practice their skills and knowledge.

Based on pre-observations that have been carried out at SMK-SMTI Makassar for the 2021/2022 academic year, students tend to be less active in carrying out practicums in the subject of Food Quality Evaluation. Based on the results of research observations, the learning outcomes of class XI PMP students can be classified in the low category. This can be seen in the results of direct observations by the teacher who found that some students only listened silently when the teacher explained or did not know anything about the material that had been taught before.

The goal to be achieved in this study is to find out student learning outcomes on the application of the inquiry model in practicum on the subject of Food Quality Testing for SMK SMTI Makassar students.

2. RESEARCH METHODS

Experimental research is a type of research that was used in this study by quasi experimental design. This study divided students into two groups namely class experimental and class control. Class Experimental will adopt the inquiry model, whereas on class control using conventional models. The following table describes the design.

Table 1. Research Design of SMK SMTI Makassar.

Class	*Pretest*	Treatment	*Posttest*
Experiment	O_1	X_1	O_2
Control	O_3	X_2	O_4

Information:

O_1 : Giving an initial test in the experimental class before being given the treatment of the learning model.

O_2 : Giving a final test in the experimental class before receiving the learning model treatment.

O_3 : Giving an initial test to the control class before being given the learning model treatment.

O_4 : Giving a final test to the control class before being given the learning model treatment.

x_1 : Applying the inquiry learning model in the classroom

x_2 : Applying the conventional learning model classes in class

2.1. Time and place

The implementation of the research was carried out at SMK SMTI Makassar. The research was conducted in April – June 2022. The research population was class XI PMP students for the 2022/2023 Academic Year and the sample used was the total number of students in the class of 24 students, which were divided into 2 categories, namely 12 students in the control class and 12 students in the experimental class.

2.2. Research procedure

The steps in this research were: 1) Determine the material to be taught by consulting with lecturers and the school. 2) Formulate learning implementation plans (RPP). 3) Prepare a learning model, namely the inquiry model practicum method in learning Food Quality Evaluation. 4) Making research tools and instruments consisting of multiple-choice test questions for students and observation sheets for teachers. 5) The implementation stage of the research was carried out by applying the inquiry model in practicum and applying the conventional learning model. 6) The final stage was to evaluate students' abilities based on the results of the pretest and posttest. At this stage, all test results from students were used as research samples.

3. RESULTS AND DISCUSSION

The Learning Implementation Plan (RPP) instrument was validated with an average score of 4.76 and included in the very good category. In general, RPP is suitable for use with revisions. Evaluation of student learning assessment tools gets an average score of 4.70 and is included in the very good category. The results of the general usability evaluation and student observation tools have an average value of 3.69 and are included in the good category, so it is worth revising (Figure 1).

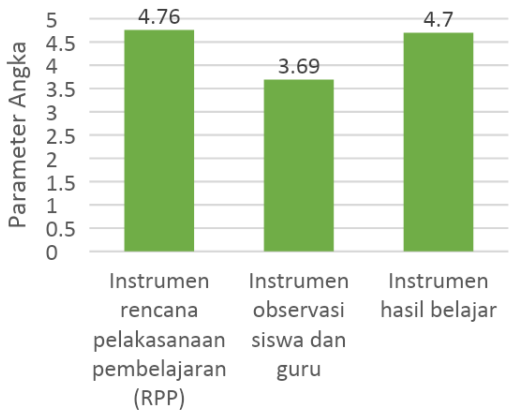

Figure 1. Instrument Validation Average Histogram.

Table 2. Teacher and Student Observation Data

Class	Percentage	
	Teacher	Student
Experiment	97%	95%
Control	91,5%	91%

Based on the output in Table 2, the teacher's activity in the experimental class scored 97% and is included in the very good category. For the control class, the score obtained by the teacher was 91.5%. Based on Table 2, student activity in the experimental class obtained 95% and was included in the "very good" category. The control class obtained a result of 91% and was included in the "very good" category (Figure 2).

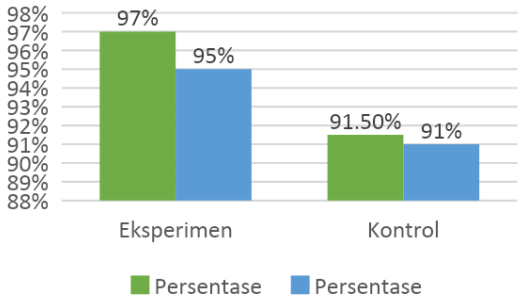

Figure 2 Observational Average Histogram Teacher and student.

Based on Table 3, there are differences in *pretest* and *posttest*. In the experimental class, the mean *pretest* students is 61.67 and the average *posttest* students is 87.08. In the control class, the average *pretest* student is 55.00 and average *posttest* students is 82.50. There is a difference in the value of student learning outcomes of 2.09. Based on this, it can be concluded that the use of inquiry-based learning models has a positive impact on student learning outcomes. The application of the inquiry model has a positive effect on practicum activities because students learn and practice designing experiments. In addition, students record data in practical activities so that the results obtained from learning can be maximized properly [3].

Table 3. Value of *Pretest* and *Posttest*.

Statistics	Experiment		Control	
	Pretest	***Posttest***	***Pretest***	***Posttest***
Lowest Value	50	80	45	75
The highest score	75	95.	65.	90
Mean	61,67	87,08	55,00	82.50
The number of students	12	12	12	12

The normality test was first performed to find the group similarity results. The results of the normality test showed that the data in this study were normally distributed (Table 4). Based on the results of the homogeneity test, the post-test scores did not differ between the experimental and control groups (Table 5).

Table 4. Normality Test Results on Learning Outcome Data.

Class	Results	Say.	Information
Experiment	*Pretest*	0,200	Normal
	posttest	0.101	Normal
Control	*Pretest*	0,037	Normal
	posttest	0,067	Normal

Table 5. Data on Homogeneity Test Results*Posttest*

Statistic test	F	Say.	Information
Levene's test	2,741	0,112	Homogeneous

Based on the *paired sample t test*, *pretest* and *posttest* significantly different (sig<0.05). Therefore, the inquiry learning model can improve student learning outcomes (Table 6). For the control class, it can be concluded that the *pretest* and *posttest* different significantly (P<0.05). Therefore, conventional learning models can also improve student learning outcomes.

Table 6. Test Result of *Paired Sample t Test*

Class	Results	Mean	T	Sig.	Information
Experiment	*Pretest* and *Posttest*	25,517	-12,770	0,000	Influence
Control	*Pretest* and *Posttest*	27,500	-21,063	0,000	Influence

Based on the results presented in Table 7, it can be seen that there are significant differences in learning outcomes between the experimental and control classes.

Table 7. Test Result of *Independent Sample t Test*

Statistic test	F	Sig.	Information
independent samples t-test	2,741	0,035	There is a difference

Based on the calculation of the N-gain value, students with the inquiry learning model obtained an increase in learning outcomes of 66.88%, while students with conventional learning obtained an increase of 61.28%. The increase in N-gain in the experimental class was higher than the control class. This increase is included in the category of 'quite effective' (Figure 3).

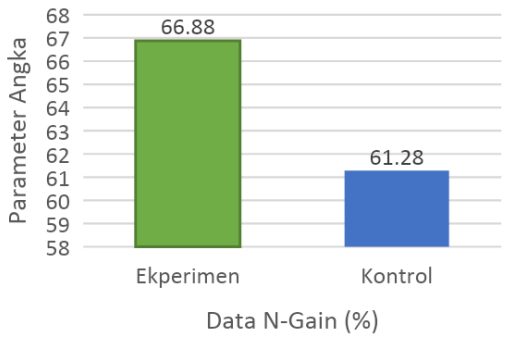

Figure 3 Experimental N-Gain Value and Control

Children's development in masteing learning material can be assisted by the application of appropriate and efficient learning models. In other words, the inquiry learning model is superior to conventional learning. This is in accordance with the results of observations made by Nurdiyah & Yonata which showed that the application of the inquiry learning model to the teaching process in the classroom was very successful with the proportion of relevant student activity increasing [4].

The effectiveness of using the inquiry model and the conventional model can be seen after students receive two different treatments in the experimental class and the control class. Students who learn using the application of the inquiry model have an N-gain score of 66.88% while students who receive treatment from the conventional learning model get an N-gain score of 61.28%. N-gain acquisition in the experimental class is higher when compared to the control class. The N-gain value in the experimental class and control class can be said to be quite effective in its application in class.

The statistical analysis above reveals that student learning outcomes are influenced by the inquiry learning model. This is related to Saur's theory which shows that learning outcomes are the result of interactions or learning actions and are usually indicated by test scores given by the teacher [5]. Student learning outcomes in the experimental group were better than the control group thanks to fun and active follow-up learning interactions. This shows that the effect of treatment is greater in the experimental class compared to the control class.

Learning outcomes are defined as increases in student achievement in learning and understanding of the material at school as measured by test scores, either for *pretest* or *posttest*. Student learning outcomes can be positive, meaning that change is good, useful, and in line with expectations. Change is active, meaning that change occurs because of the desire and hard work of one's own efforts. Meanwhile, negative learning outcomes are bad consequences for learning activities experienced by students when experiencing certain situations, which will later affect students' capacity or knowledge of the achievements made during learning.

4. CONCLUSION

Based on the results of the research conducted, the class using the inquiry model has a better average score than the class using the conventional model. In addition, the increase in learning outcomes in the inquiry class is greater than in the conventional class. This shows that the inquiry model is said to be a more effective learning model compared to the conventional model.

REFERENCES

[1] Maria, E., & Sediyono, E. (2017). Development of an ICT-Based Learning Management Model in Elementary Schools.*Manage: Education Management Journal*, *4*(1), 59–71.

[2] Hamruni, H. (2012).*The Concept of Edutainment in Islamic Education*. Yogyakarta: Postgraduate Program at UIN Sunan Kalijaga.

[3] Handriani, L. S., Harjono, A., & Doyan, A. (2015). The Effect of Structured Inquiry Learning Model with Scientific Approach on Critical Thinking Ability and Student Physics Learning Outcomes.*Journal of Physics and Technology Education*, *1*(3), 210–220.

[4] Nurdiyah, M. S., & Yonata, B. (2022). Implementation of the Guided Inquiry Learning Model to Train Critical Thinking Skills in Senior High School. *Incandescent Mipa Journal*, *17*(2), 148–155.

[5] Dimyati, & Mudjino. (2014).*Learning and Learning*. Jakarta: Rineka Cipta.