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Application of research-based jurisprudence inquiry learning to students' critical thinking skills

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ABSTRACT

Students find it difficult to compete in the 21st century job market or do not yet have skills in the job market, but companies are having a hard time finding employees. The lack of programs to train critical thinking, so students are less willing to ask questions, more to take notes and memorize. Indonesia's golden age in 2045 is expected to be transformed into a developed country. Therefore, the learning concept must improve critical thinking skills, creativity, innovation and collaboration. The purpose of this study is to improve students' skills in critical thinking and build student and community collaboration. The research method used is a quasi experiment with a nonequivalent pretest-posttest control group design. The research sample was regular class A as the experimental class and regular class B as the control class with 15 students each through purposive sampling. The test instrument consisted of an essay test adjusted to the critical thinking indicators. The results of the study were analyzed using a t-test which obtained a 2-tailed sig value (0.00) <α (0.05) so that H1 was accepted, meaning that there was an influence of the Research-Based Jurisprudence Inquiry model on students' critical thinking skills.

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INTRODUCTION

Education and culture can be likened to a wheel that is interconnected with each other. Education as a means to prepare the intellectual aspect of the nation's children, while culture as a means to strengthen the "soft skill" aspect so that superior humans are formed who are ready to face the life of society in the era of Society 5.0 (Khairi et al., 2022). Strengthening education in the context of forming the nation's intellectuals is an obligation and noble task of formal and non-formal educational institutions (Harun, 2022). Based on this, education in Indonesia must also be in line with the concept of society 5.0 (Suranto et al., 2022) . Therefore, planning or learning concepts are needed that are in line with the development of the era, it is necessary to have a curriculum design that contains competencies in the form of skills needed by the Society 5.0 community and the

Industry 4.0 era. The Industry 4.0 era is more dominant in terms of technology, not in humans as its center (Suranto et al., 2022).

The education system in Indonesia focuses on core subjects which makes people too generalist, but this kind of system makes us build a solid foundation and knowledge so that there are more generalists than specialists (Labolo, 2023) (Hapudin, 2021). A national standard education system, meaning a curriculum maintained by the government, helps students from Sabang to Merauke to have more consistent quality and education that is integrated with the values of nationalism and patriotism, so that the downside that arises is that learning tends to be irrelevant to current needs (Musfah, 2020) (Rizani, 2022). Students are less able to compete in the 21st century job market or do not yet have skills in the job market, there are many unemployed but companies are having a hard time finding employees. The lack of programs to train critical thinking, so students are less willing to ask questions, prefer to take notes and memorize (Mashudi et al., 2023).

Learning models that are oriented towards strengthening competencies or career life skills, always learning and innovating, mastering information media technology, thinking critically in solving problems, being skilled at communicating, having a creative and innovative spirit and being able to work together in a group, are very necessary and are developed creatively by educators (Hernawati & Mulyani, 2023) (Raharjo, 2018). The concept of learning in this era is of course in line with the competencies expected in the 21st century (Badriyah et al., 2021). To provide space for students to discover the concept of knowledge and creativity (Sitompul et al., 2024) (Samosir et al., 2023)(Sitompul et al., 2019).

The most important learning outcome is to have the strength and ability to learn to develop oneself further. Not only gaining knowledge and metacognitive competence but also being able to develop one's abilities (Aini et al., 2023). The Research-Based Inquiry Jurisprudence learning model is an alternative choice of learning method in the era of society 5.0 (Samosir et al., 2023). This is because this model focuses on competency learning that prepares students to face the challenges of the society 5.0 era (Andriani, 2023). The model developed by Donald Oliver and James Shaver P (1966/1974) was created to help students think systematically about contemporary issues. This ability to think systematically is needed by students to respond to issues currently circulating in society (Sitompul et al., 2024).

Research-based learning is based on the philosophy of constructivism which includes 4 (four) aspects, namely: learning that builds student understanding, learning by developing prior knowledge, learning which is a process of social interaction and meaningful learning achieved through real experience (Sanusi & Carlian, 2024). Research is an important tool for improving the quality of learning (Suranto et al., 2022). The research components consist of: background, procedures, implementation, research results and discussion and publication of research results. All of these provide important meanings that can be seen from several perspectives: problem formulation, problem solving, and communicating the benefits of research results. This is believed to be able to improve the quality of learning (Kholis & Rigianti, 2023).

Research-based learning (RBL) is a method that actively involves students in exploring information. This learning integrates research in its process (Roro Forijati, 2019). PBR provides opportunities for students to seek information, formulate hypotheses, collect data, analyze data, and draw conclusions based on the data that has been compiled (Zahrawati & Aras, 2020). This activity applies learning with a "learning by doing" approach. In addition, PBR is an application of the characteristics of research actions and meaningful learning which in its application is centered on students (student-centered learning). Finally, it can develop students' professional competence (Slameto, 2021).

Based on the background that has been described above, the formulation of the problem that can be formulated is how to implement the Research-Based Inquiry Jurisprudence learning model on critical thinking skills.

RESEARCH METHODOLOGY

The type of research used in this study is Quasi Experiment or semi-experimental and uses a non-equivalent control group design (Nonequivalent Control Group Design) consisting of two groups as a comparison. Both groups were given a pretest and posttest. This research was conducted in the odd semester of the 2024/2025 academic year at Deli Sumatera University (Syaiful Anam, 2023) (Santoso et al., 2023). The population of this study was all fifth semester students totaling 187 students. The research sample was students of the Agribusiness study program and in the first semester in general chemistry courses with a total of 30 people. The sampling technique in this study was by using the Purposive sampling technique, then regular class A with 15 students was determined as the experimental class and regular class B with 15 students as the control class.

The data collection technique in this study used a test in the form of 5 essay questions related to thinking skills. The data analysis technique used in this study was comparative statistics, namely comparing the test results of the experimental class after using the Research-Based Inquiry Jurisprudence learning model with the test results of the control class. In accordance with the formulation of the problem contained in this study to analyze the data, this study uses hypothesis testing using the t-test. The t-test is used to determine how much difference there is in the Posttest results of the control class and the experimental class.

RESULTS AND DISCUSSIONS

Data on students' critical thinking skills obtained from essay questions that are adjusted to the aspects of critical thinking skills in acid-base material. The following are the results of processing the values of the pretest and posttest essay questions in the control class and the experimental class.

Description of Pretest and Posttest Result Data in Control Class and Experimental Class

The description of the pretest and posttest data in the form of essay questions with aspects of students' critical thinking skills on the material of nanotechnology atomic structure in the experimental and control classes is presented in Table 1 below:

Table 1. Description of pretest and posttest result data in control class and experimental class

Data	Pretest		Posttest	
	Experiment	Control	Experiment	Control
Number of Students (N)	31	31	31	31
Minimum Value	6	8	55	49
Maximum Value	31	33	86	80
Average value	17.56	20.07	70.90	63.88
Standard Deviation	8.83	7.33	9.48	8.58

Description of Pretest Data Based on Critical Thinking Skills Aspects in Experimental Class and Control Class

In this study, 5 (five) aspects of critical thinking were used according to Ennis (in Costa, 1985), namely providing simple explanations (elementary clarification), building basic skills (basic support), concluding (inference), providing further explanations (advance clarification), and arranging strategies and tactics (strategy and tactics). Table 2 presents the results of the pretest using aspects of critical thinking skills in the experimental class and control class as follows:

Table 2. Pretest result data for critical thinking skills aspects of experimental class and control class

No	Critical Thinking Aspects	Control Class		Experimental Class	
		%	Category	%	Category
1	Providing Simple Explanation (Elementary Clarification)	19.00	Very Low	21.51	Low
2	Building Basic Support	22.58	Low	17.20	Very Low
3	Inference	10.04	Very Low	13.62	Very Low

No	Critical Thinking Aspects	Control Class		Experimental Class	
		%	Category	%	Category
4	Providing Further Clarification	27.42	Low	14.52	Very Low
5	Setting Strategy and Tactics	26.88	Low	20.97	Low
	Average	21.18	Low	17.56	Very Low

Posttest Data Description Based on Critical Thinking Skills Aspects in Experimental Class and Control Class

The posttest results data using critical thinking skills aspects in the experimental class and control class are presented in Table 3 as follows:

Table 3. Posttest result data for critical thinking skills aspects of experimental class and control class

No	Critical Thinking Aspects	Control Class		Experimental Class	
		%	Category	%	Category
1	Providing Simple Explanation (Elementary Clarification)	62.80	Tall	65.59	Tall
2	Building Basic Support	70.97	Tall	86.02	Very high
3	Inference	62.74	Very Low	13.62	Very Low
4	Providing Further Clarification	66.88	Low	78.53	Very Low
5	Setting Strategy and Tactics	57.09	Low	62.26	Low
	Average	64.09	Low	71.37	Very Low

This hypothesis test can be done after the prerequisite test has been carried out. Based on the prerequisite test that has been carried out by the researcher, it was found that the data obtained were normally distributed and homogeneous data so that the researcher conducted a hypothesis test using the t-test. The t-test is a statistical test that aims to test two different groups with the principle of comparing the mean values of the two groups (Abdurrahman et al., 2021). The t-test conducted was the independent sample t-test. This test uses the assistance of the SPSS version 26 program with a significance (α) of 0.05. The hypothesis used in this hypothesis test is H0: There is no effect of the application of the research-based inquiry jurisprudence learning model on students' critical thinking skills. H1: There is an effect of the application of the research-based inquiry jurisprudence learning model on students' critical thinking skills.

The results of the hypothesis test using the independent sample t-test pretest conducted by the researcher are presented in Table 4 as follows:

Table 4. Results of the independent sample t-test pretest

Statistics		α	Conclusion
df	Sig. (2-tailed)		
60	0.26	0.05	*Sig. (2-tailed) >αthere is no significant difference in mean*

Based on Table 4, it can be seen that the sig. (2-tailed) pretest value is 0.26, which shows that the sig. (2-tailed) value is greater than the significance level (α) which is 0.05 so it can be concluded that there is no significant difference in the average of the pretest results in the control class and the experimental class. This shows that the control class and the experimental class have the same critical thinking skills. Furthermore, hypothesis testing using the independent sample t-test was also carried out on the posttest results of the control class and the experimental class. The results of the hypothesis test using the independent sample t-test on the posttest data are presented in Table 5 below:

Table 5. Results of the independent sample t-test pretest

Statistics		α	Conclusion
df	Sig. (2-tailed)		
60	0.00	0.05	*Sig. (2-tailed) <αthere is a significant difference in the average*

Based on Table 5, the sig. value (2-tailed) for the posttest data is 0.00, which is a sig. value (2-tailed) that is smaller than the significance level (α) is 0.05. This shows that there is a significant difference in the average posttest results of the control and experimental classes. Thus, Ho is rejected, which means that the research-based jurisprudence inquiry learning model has an effect on improving students' critical thinking skills in acid-base material.

CONCLUSION

Based on the results of the research and discussion that have been conducted by the researcher, it can be concluded that there is an influence of the research-based jurisprudence inquiry learning model on students' critical thinking skills in acid-base material. This is shown by the results of the hypothesis test on the posttest data in the experimental class and control class using the t-test, namely the Independent Sample Test with a significant level (α) which is 0.05 produces a sig value (2-tailed) of 0.00. Thus, the sig value (2-tailed) is smaller than the significance level (α) (0.00 < 0.05) so that Ho is rejected while H1 is accepted. This shows that there is an influence of the research-based jurisprudence inquiry learning model on students' critical thinking skills in the atomic structure-nanotechnology material.

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