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The Relationship Between Laboratory Management and Improving the Quality of Learning in College

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Abstract

Laboratory management in educational institutions is regulated in accordance with applicable regulations, governance and is applied consistently. This study aims to analyze the relationship between laboratory management and improving the quality of learning in college. Quantitative research with a survey approach involving 50 respondents using the Non Probability Sampling method with the Total Sampling technique. Data acquisition using student perception instruments on laboratory management and learning quality, analyzed using research hypothesis testing and correlational tests. The results of Sig, (2-tailed) <0.001 (less than 0.05) and Pearson Correlation 0.857 (more than 0.279 in the N = 50 table significance 5%) with a positive relationship indicating a significant relationship between the two variables. This study concludes that there is a significant relationship between laboratory management and improving the quality of learning in college.

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1. Introduction

Educational institutions in Indonesia depend on the quality of their human resources to be oriented in advancing a nation. The Government of the Republic of Indonesia prioritizes improving the quality of human resources and the quality of national education, through the ratification of the National Education Law No. 20 of 2003 which is a strong foundation. According to the Government Regulation of the Republic of Indonesia no. 32 of 2013 concerning standards, content, processes, graduate competencies, standards of educators and education personnel, standards of facilities and infrastructure, standards of management, financing and standards of education assessment. There are several things that must be considered so that learning in the laboratory runs optimally, namely the division of the number of students per practicum group, the ratio of practicum supervisors to the number of

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students, the ratio of the availability of tools and materials to the number of students, the number of credits in the needs of practicum courses, the suitability of practicum methods, the availability of updated guidelines or practice guides (Pusdiknakes, 2009). Educational facilities and the application of technology are one of the factors that can improve the quality of education in a macro perspective, while in a micro perspective it can be said that professional teaching staff are a dominant factor that has a large relationship to the quality of education. Laboratory management in college requires regulations to regulate and support activities to be more optimal, this is done to facilitate the achievement of learning quality goals. Regulations governing operational instructions for activities must be arranged systematically and implemented consistently. The laboratory is one of the facilities and infrastructure that has a comprehensive system, namely having supporting facilities supported by human resources (Pareek, 2019). Management is defined as an activity carried out to achieve the main goals and objectives that have been determined. Therefore, it can be said that the activities carried out in management are managing people who are used as implementers (Arifin Abdurrachman, 2008). Management is a process consisting of planning, organizing, behavior and control activities that aim to achieve predetermined goals through the efficient use of human resources and other supporting resources (George R. Terry, 2010). Laboratory management in college is regulated in accordance with applicable regulations and governance, and is also applied consistently (Bestari, 2022). Laboratory management related to the management of laboratory equipment, facilities and infrastructure, scheduling, practical activities, and workloads need to be managed with a systematically monitored system (Mesfin et al, 2017). The procurement of this management system includes organizational structure, division of workload, and composition of laboratory management personnel (Jiaqi, 2022).

The laboratory is a vital facility in academic activities at college, with management carried out systematically. Consisting of testing processes, calibrations, and limited production activities with the use of tools and materials according to their scientific groups, so that the Tri Dharma of Higher Education activities can be carried out. This is done to improve the quality of higher education, both in terms of education, research, and community service (Kemenpan RB, 2019). Learning activities in the laboratory are carried out effectively with the aim of improving students' skills, knowledge and attitudes, and also play a role in building self-confidence and achieving competencies according to their field of knowledge (Zainudin, 2001).

Learning quality is the result of an assessment of a learning process that is born from the professional ability of a teacher in carrying out his teaching duties (Dadang Suhardan, 2010). So, learning quality is a quality in a learning process carried out by teachers, which produces graduates or output in educational institutions. Law No. 20 of 2003 concerning the National Education System, article 1 explains that learning is a

process of activities carried out by students and educators, as well as supporting sources found in the learning environment. Learning quality management is a process of student learning activities in learning which includes planning, implementation, evaluation and supervision in order to achieve goals and quality graduates. So, it can be concluded that the professional ability of teachers and the provision of laboratory facilities and infrastructure that are managed effectively are the main components in improving the quality of learning in college.

2. Method

This research was conducted in 2 Laboratory Rooms, namely the Anesthesia Nursing Laboratory Room and the Obstetrics Laboratory Room. The research time was carried out on Monday, May 24, 2024. This research method uses a quantitative approach with a cross-sectional research design, namely conducting research at one time. This study uses a cross-sectional approach with the intention of identifying the relationship between laboratory management and improving the quality of learning in one measurement using a questionnaire measuring instrument. The type of questionnaire method in this study is a closed questionnaire for each variable totaling 5 questions, with a total of 10 questions in the form of a Likert scale. The population in this study was 50 people. The sample was taken using the Non Probability Sampling method with the Total Sampling technique, where all members of the population were used as samples (Sugiyono, 2016). So the sample in this study was determined as 50 respondents who met the inclusion and exclusion criteria. The inclusion criteria in this study were lecturers and students who participated in the implementation of practical learning in the Anesthesia Nursing Laboratory and Obstetrics Laboratory on Monday, May 24, 2024, and the exclusion criteria in this study were lecturers and students who did not participate in the implementation of practical learning in the Anesthesia Nursing Laboratory and Obstetrics Laboratory on Monday, May 24, 2024.

3. Results

1. Statistic Descriptive

Table: I Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Laboratory Management	50	14.00	20.00	18.2600	1.80487
Learning Quality	50	13.00	20.00	18.2200	2.07305
Valid N (listwise)	50				

Based on the results of the descriptive test above, it can be explained that the distribution of data obtained from the Laboratory Management variable can be described that the minimum value is 14.00 while the maximum value is 20.00 with an average leadership style of 18.2600 and a standard deviation of 1.80487, and in the Learning Quality variable from the data, it can be described that the minimum value is 13.00 while the maximum value is 20.00 with an average Learning Quality of 18.2200 and a standard deviation of 2.07305.

2. Validity Test

Table: II Questionnaire Validity Test

Questionnaire	r product moment	r tabel 5%	Result
Laboratory Management			
LM1	0,702	0,279	Valid
LM2	0,757	0,279	Valid
LM3	0,473	0,279	Valid
LM4	0,735	0,279	Valid
LM5	0,831	0,279	Valid
Learning Quality			
LQ1	0,859	0,279	Valid
LQ2	0,817	0,279	Valid
LQ3	0,804	0,279	Valid
LQ4	0,721	0,279	Valid
LQ5	0,818	0,279	Valid

It can be seen from the information above that all questionnaires are declared valid.

3. Reliability Statistic

Table: III Reliability Statistics

Cronbach's Alpha	N of Items
.915	10

The results of the reliability test showed that all questionnaires were declared reliable because the reliability coefficient value was 0.915 > 0.6. In accordance with Ghozali's opinion (2001) that a statement is declared reliable if the Cronbach Alpha value is greater than 0.6.

4. Normality Test

Table: IV

Correlations

				Laboratory Management	Learning Quality
Laboratory Management	Pearson Correlation			1	.857**
	Sig. (2-tailed)				<.001
	N			50	50
	Bootstrap[b]	Bias		0	-.001
		Std. Error		0	.040
		95% Confidence Interval	Lower	1	.766
			Upper	1	.922
Learning Quality	Pearson Correlation			.857**	1
	Sig. (2-tailed)			<.001	
	N			50	50
	Bootstrap[b]	Bias		-.001	0
		Std. Error		.040	0
		95% Confidence Interval	Lower	.766	1
			Upper	.922	1

**. Correlation is significant at the 0.01 level (2-tailed).

b. Unless otherwise noted, bootstrap results are based on 5000 bootstrap samples

Based on the results of the normality test, the Correlation between Laboratory Management and Learning Quality of 0.857 indicates a very strong positive relationship. When laboratory management improves, the quality of learning tends to increase significantly. The p value = 0.000 (p <0.01) indicates that this relationship is statistically significant. This means that the possibility of this relationship occurring by chance is very small. in the Bootstrap results, the 5% confidence interval shows a correlation range of 0.766 to 0.922 indicating that these results are consistent, and the small Bias and Standard Error support the stability of the correlation estimate. So the results state that there is a strong and significant positive relationship between Laboratory Management and Learning Quality. Improvements in laboratory management can directly support improvements in the quality of learning.

5. Hypothesis Test

Table: V

Correlations

		Laboratory Management	Learning Quality
Laboratory Management	Pearson Correlation	1	.857**
	Sig. (2-tailed)		<.001
	N	50	50
Learning Quality	Pearson Correlation	.857**	1
	Sig. (2-tailed)	<.001	
	N	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

Based on the results of the correlation test of Laboratory Management and Learning Quality is 0.857. This value shows a very strong positive relationship between the two variables. This means that the better the laboratory management, the higher the quality of learning. The Sig. value (p-value) is 0.000 ($p < 0.01$), indicating that this relationship is statistically significant, stating that the relationship found did not occur by chance and can be trusted. So it can be concluded, There is a very strong and significant relationship between Laboratory Management and Learning Quality. Improvements in laboratory management tend to significantly improve the quality of learning.

4. Discussion

Therefore, the results of this study can be said to be successful because a relationship was found between Laboratory Management and Improving the Quality of Learning. Based on the literature review, there are similarities between the research conducted by the author and previous studies. However, none of them focused on finding a relationship between the implementation of laboratory management and improving the quality of learning. Therefore, the author is enthusiastic and confident in conducting this study in order to develop laboratory management in order to create an increase in the quality of learning in higher education.

There is a significant relationship between laboratory management and improving the quality of learning, the results of this study support the theory of George R. Terry, (2010) which states that Management is a process consisting of planning, organizing, behavior and control activities that aim to achieve predetermined goals through the efficient use of human resources and other supporting sources, and the theory of learning quality according to Dadang Suhardan, (2010) the results of an assessment of a learning process that arises from the

professional abilities of a teaching staff in carrying out their teaching duties. Thus, the research hypothesis is supported by empirical data.

5. Conclusions

Based on the results and discussion in this study that Sig, (2-tailed) <0.001 (less than 0.05) with Pearson Correlation results of 0.857 (more than 0.279 in the N = 50 table significance 5%) with a positive relationship form, these results indicate that in both variables there is a very strong correlation/relationship. The results of this study are not in line with Skinner's theory (1953) on the behavioristic approach focusing on stimulus-response, with an emphasis on reinforcement rather than the physical environment such as laboratories, which states that laboratory management may not be the main factor in learning, as well as previous research by Rahman and Sari (2020) which states that even though laboratory facilities are good, learning outcomes do not increase significantly without the support of innovative teaching strategies. This is due to the lack of optimization of learning in different laboratories, the achievement of different learning quality indicators in each college or differences in regulations in laboratory management. Thus, the hypothesis of this study is not supported by empirical data (this is a negative research result).

However, good laboratory management can improve the quality of learning in college. The results of this study support Piaget's theory (1970) which states that experimental-based learning experiences are very important in active learning. A well-managed laboratory can be an ideal place to create experiential learning. and previous research by Khan et al. (2017) which examined the relationship between laboratory management and learning outcomes in college. The results of this study indicate that a well-managed laboratory can help students develop important practical skills, which directly contribute to improving their learning outcomes and understanding of the material being studied.

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