The Importance of Innovation in Learning Facilities to Support Student Competency Development

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***Abstract*—Innovative learning environments play a critical role in fostering key competencies in higher education. The research was conducted using a survey method involving the participation of alumni representatives from all study programs at UINSU. Based on the findings from 490 samples alumni, it is known that the emphasis on learning and learning aspects contribute significantly to predicting the perception of competence possessed by alumni (Y). However, learning facilities do not significantly contribute to Y. Based on the findings, facilities such as laboratories, libraries, and classrooms were deemed statistically insignificant in affecting competency development. Instead, learning methods, student engagement, and teaching quality played a more dominant role. Some of the causes of insignificant learning facilities are underutilization of resources, traditional teaching, and access barriers. The recommended improvement is innovation in evolve to become more integrated with teaching methods, fostering active, experiential, and collaborative learning. Universities should focus not only on building modern facilities but also on ensuring these facilities are effectively utilized to support competency development.**

Keywords*:* Competency development, Higher studies, Leaning facilities innovation

1. INTRODUCTION

Higher education plays a crucial role in shaping competent human resources who are ready to compete in the workforce. Competence is reflected in the abilities, skills, knowledge, and attitudes necessary to perform specific tasks or jobs effectively [1], [2]. Producing competent alumni is a major challenge for higher education institutions, as competence is a primary requirement of the industry for its workers [3]. Therefore, being competent is one of the keyways to entering the workforce, making it highly important. In fact, the government has set competence as the first criterion for measuring the performance of higher education institutions [4].

A World Bank report shows that higher education in Indonesia has seen significant improvements in both quality and accessibility over the past few decades [5]. The 2022 National Labor Force Survey (Sakernas) indicates that higher education graduates have a higher labor force participation rate compared to high school graduates, and the open unemployment rate (TPT) for university graduates is lower than for high school graduates. This demonstrates that higher education graduates are better prepared to enter the workforce [6]. According to the Ministry of Education, Culture, Research, and Technology (Kemenbudristek, 2023), more than 60% of students participating in the

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"Kampus Merdeka" program (internships, independent projects, student exchanges) gained direct experience that enhanced their competitiveness in the job market.

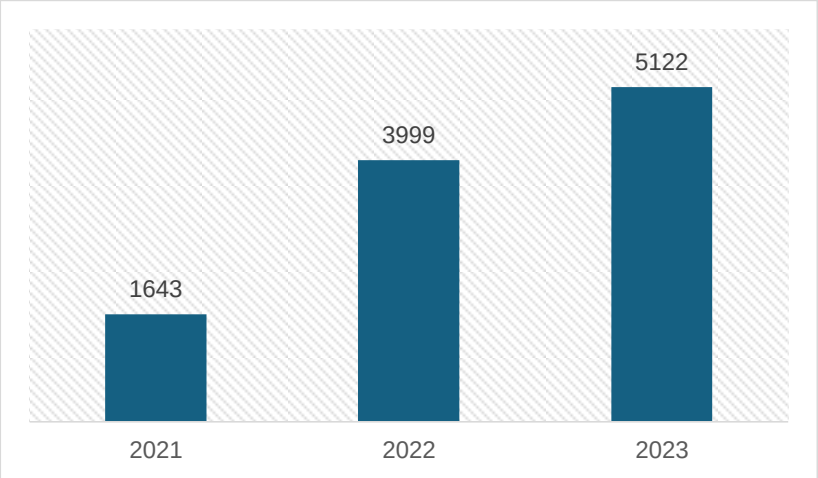

Figure 1 Development of the Number of UIN SU Bachelor Graduates (processed data, 2023)

UIN Sumatera Utara (UIN-SU) has witnessed a remarkable trajectory in its alumni growth, with the number of graduates surging from 1,643 in 2021 to 5,122 in 2023. This exponential increase is not only indicative of the university's expanding footprint in higher education but also highlights its potential impact on the professional landscape. As UIN-SU continues to produce a growing number of graduates, it becomes imperative to critically assess the competencies these alumni bring into the workforce. Understanding how well they are equipped to navigate and contribute to various industries is crucial for evaluating the institution's alignment with the ever-evolving demands of the modern economy. By examining the strengths and areas for development in alumni competencies, UIN-SU can refine its educational strategies to ensure that it is fostering highly skilled professionals who can thrive and innovate in diverse, competitive environments.

The phenomenon of many higher education graduates working in fields unrelated to their competencies is a common issue in higher education, including among graduates of UIN North Sumatra. Relevant studies are those related to the tracer study mechanism, such as the research by Marliyah and Budi Dharma (2021). The alumni tracking records of FEBI UIN SU Medan reveal that many graduates are employed outside the specifications of the faculty of Islamic economics and business graduates [7], [8], leading to the conclusion that education has not yet been fully optimized.

One way to assess this phenomenon is by conducting a "Link and Match" study, which refers to the relationship and alignment of graduates' skills in global education with the demands of the job market [9]. This explanation highlights the urgency of understanding the link between education programs and the industry, particularly in identifying skill requirements, especially for UIN North Sumatra graduates. Dwimawati et al. (2015) also studied how the specialization of samples aligns with the job market using the "Link and Match" program approach [10].

The contribution of higher education is reflected in variables such as the learning aspects, emphasis on the learning process, and the availability of learning facilities. Graduate competence is identified by how much benefit students gain from the learning process at the university. This reflects the core issue being explored: the effectiveness and impact of higher education on the development of student competencies. Therefore, the

researchers aim to explore and develop hypotheses regarding the "Link and Match" for UIN SU Medan graduates [11], [12], [13].

Higher education plays a crucial role in shaping competent human resources ready to compete in the workforce. Competence is reflected in the ability, skills, knowledge, and attitude to perform specific tasks effectively. However, producing competent alumni is a significant challenge for higher education institutions. Even the government sets this criterion as the first benchmark for measuring the performance of higher education [13], [14], [15], [16].

One of the key factors influencing the success of higher education is the availability of adequate learning facilities. Learning facilities, including classrooms, laboratories, libraries, technology access, and other learning environments, play a vital role in supporting effective learning processes. Good facilities enable students to more easily receive and understand the material being taught, helping them develop competencies that align with industry and job market needs.

Previous studies have shown that the quality of learning facilities is directly correlated with students' academic achievement [17]. Students who study in environments with supportive facilities tend to have a better understanding and can apply their knowledge practically in real-world situations. Conversely, limited learning facilities can hinder the acquisition of competencies, making it difficult for students to reach their full potential.

2. METHOD

The research utilized a survey method, which is a quantitative approach that falls within the scope of field research. The objective of the study was to establish relationships between variables suspected to be interconnected. The survey was the recommended research approach for this study [18], [19]. Specifically, the framework employed a deductive reasoning model within the quantitative approach. The research design used a systematic approach in the form of an activity flowchart. To examine the transdisciplinary approach in the implemented research process, the researcher applied a descriptive approach.

The research was conducted at the State Islamic University of North Sumatra (UIN SU) in Medan. UIN SU Medan has 37 undergraduate programs that produced graduates in 2021. These programs are spread across Medan, North Sumatra. The sample was determined using probability sampling, with the critical sample target being the 2021 graduates [19] those who had graduated two years before the research (in 2023), in accordance with SN DIKTI regulations. The identified population consisted of 1,643 alumni (source: PDDIKTI UIN SU). Using the Slovin formula, the minimum required sample size was determined to be 321 alumni, with a 5% margin of error.

Data analysis employed quantitative descriptive analysis, which is the process of summarizing data or information to provide a clear description of the variables under study in the sample. Information obtained from alumni tracking results was also analyzed descriptively to develop an alumni profile analysis through an alumni tracking survey [20]. This was followed by an evaluation of the statistical significance of each regression coefficient, indicating the significance of the relationship between predictor and dependent variables (T-test and F-test), as well as an evaluation of the model quality through analysis of metrics such as R-squared (coefficient of determination).

3. RESULT AND DISCUSION

By 490 sample data with a minimum number of samples per study program target maintained at 5 alumni, the result describes in Figure 1. Figure 1 illustrates the percentage

of career choices or paths taken by the research sample. The figure provides an overview of the career or educational path preferences selected by a group of individuals, expressed in percentages. Of the total respondents, 44.4 % chose to work for a company, possibly after completing their studies or during a career transition. Many respondents, 47.4%, opted to start their own business or become entrepreneurs. Only 8.2% of the respondents decided to continue their studies at a higher level, such as pursuing a master's degree.

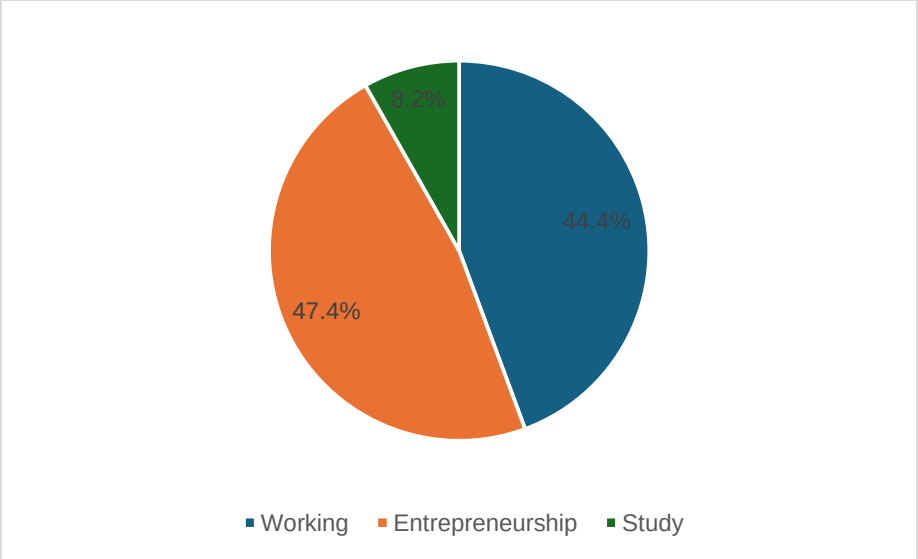

Figure 1 Sample Job Data

Table 1 T Test Result

Model		Unstandardized Coefficients		t	Sig.
		B	Std. Error		
1	(Constant)	85,706	4,656	18,406	,000
	X1	1,186	,294	4,032	,000
	X2	1,019	,211	4,837	,000
	X3	,008	,107	,074	,941

The conclusion of the hypothesis is that X1 and X2 have statistically significant coefficients (p-value < 0.05), meaning they contribute significantly to predicting the dependent variable (Y1). However, X3 is not significant (p-value = 0.941), indicating that this variable does not significantly contribute to the dependent variable in the model built for the first hypothesis. The insignificance of X3 in this regression model may be due to factors such as a lack of variation, low correlation, multicollinearity with other variables, or reduced relevance in the context of this study. To improve the model, further analysis is necessary to ensure that all relevant variables have been included and that the model specification aligns with the data. It might also be beneficial to consider transforming the variables or applying alternative analytical methods to capture more complex relationships.

Table 2 F Test Result

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	48497,748	3	16165,916	42,312	,000[b]
	Residual	185681,558	486	382,061		
	Total	234179,306	489			
a. Dependent Variable: Y1, b. Predictors: (Constant), X3, X1, X2						

The conclusion from Table 2 is that the significance of the model, indicated by a p-value (Sig.) of 0.000, shows that the overall regression model is statistically significant. This means that at least one of the predictors (X1, X2, X3) is significantly associated with the dependent variable (Y1). The F-statistic, with an F value of 42.312, also indicates that the regression model as a whole is significant at a 0.05 significance level. This supports the hypothesis that the predictors in the model have a significant relationship with the dependent variable. Overall, the ANOVA table confirms that the regression model, using predictors X1, X2, and X3, is a significant model for explaining variability in the dependent variable Y1.

Table 3 R Square Result

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,455[a]	,407	,402	19,546
a. Predictors: (Constant), X3, X1, X2				
b. Dependent Variable: Y1				

The multiple correlation coefficient in this case is 0.455, indicating the level of association between the predictors and the dependent variable. This value suggests a moderate positive correlation between the predictors (X1, X2, X3) and the dependent variable (Y1). The R^2 value is 0.407, meaning that approximately 40.7% of the variability in the dependent variable (sumY1) can be explained by the model using the predictors X1, X2, and X3. The adjusted R^2 value is 0.402, which adjusts the R^2 to account for the number of predictors in the model and the sample size. This value is slightly lower than R^2, as it reduces the possibility of overfitting. The standard error of the estimate is 19.546, which measures the level of prediction error in the regression model. The smaller this value, the better the model is at predicting the dependent variable.korelasi berganda, yang dalam hal ini adalah 0,455.

Discussion

The evaluation of learning in higher education is a crucial process to ensure that educational objectives are met, and that graduates' competencies align with industry expectations and labor market demands. Based on existing findings, this analysis will discuss the influence of learning aspects and learning emphasis variables on student competencies, as well as evaluate the insignificance of learning facilities in affecting these competencies. Additionally, it will address the gap between alumni's expectations of competencies and the competency assessments derived from the learning process.

The learning aspect, which includes teaching methods, significantly influences student competencies. Active and participatory learning methods, such as group discussions,

collaborative projects, and applied research, have been shown to enhance students' understanding and practical skills. In his study on active learning, Prince (2004) found that teaching methods that involve students directly in the learning process can improve conceptual understanding and critical thinking skills[21]. Freeman et al. (2014) also found that students engaged in active learning showed significant improvements in academic performance compared to traditional teaching methods [22].

A learning emphasis that focuses on practical applications and real-world relevance significantly contributes to the development of student competencies. Emphasizing problem-solving, critical thinking, and analytical skills encourages students to apply theory to real-world situations. Learning emphasis was previously studied by Kolb (1984) in his theory of experiential learning, which highlights the importance of direct experience in learning and its ability to enhance students' practical competencies. Garrison & Kanuka (2004) demonstrated that problem-based learning helps students develop the critical and analytical skills required in the workplace [21], [22].

Although learning facilities such as laboratories, libraries, and information technology are essential in supporting the educational process, findings suggest that these facilities do not significantly affect student competencies. This could be due to factors such as quality versus quantity, where the availability of adequate facilities is not always matched by optimal use by students and faculty. Another factor is the focus on teaching, where competency development is more influenced by teaching methods and approaches than by physical facilities themselves. The accessibility of facilities might also be an issue, as some may not be fully accessed or utilized by all students. Additionally, other factors, such as cafeterias and restrooms, which are not directly related to competency development, are also considered areas of concern.

Based on the findings, facilities such as laboratories, libraries, and classrooms were deemed statistically insignificant in affecting competency development. Instead, learning methods, student engagement, and teaching quality played a more dominant role. This is supported by Pascarella and Terenzini (2005), who also concluded that quality teaching and student involvement outweighed physical facilities in determining learning outcomes [23].

The following are the causes of the weak impact based on findings in the field: Underutilization of resources: Even if facilities are available, their utilization by students and faculty might be minimal, reducing their potential to foster competencies. Focus on Traditional Teaching, University still emphasize traditional lecture-based methods, innovative learning spaces may not be fully exploited for active learning, collaboration, or problem-solving activities. There are access barriers, where not all students might have equal access to advanced facilities, which can diminish their effectiveness in building competencies.

While facilities may have a limited direct effect in the research context, their potential impact on competency development should not be understated. Innovative learning environments have been proven to significantly contribute to the development of critical 21st-century skills, including collaboration, problem-solving, and critical thinking. Constructivism posits that learners build their own understanding through interaction with their environment. Facilities that provide opportunities for experiential learning (labs, workshops) support this theory by allowing students to engage directly with materials and collaborate with peers. Its conduct active learning spaces, that innovative facilities such as collaborative classrooms, makerspaces, and simulation labs enable hands-on learning, which is crucial for applying theoretical knowledge to real-world problems [24].

Kolb’s theory emphasizes learning through experience. Project-based learning [25] and simulation activities within innovative facilities allow students to cycle through concrete

experiences, reflection, and application—thereby developing deeper competencies. It needs to technology-enhanced learning to facilities that integrate digital technologies (e.g., smart classrooms, VR labs) provide students with tools to develop digital literacy, critical in today's workforce. And, flexible learning environments, spaces that support both individual and group work encourage flexibility in learning styles and foster competencies like communication and teamwork.

4. CONCLUSION

While the UIN SU Medan research highlighted the limited statistical significance of learning facilities, global evidence shows that innovative learning environments play a critical role in fostering key competencies. For facilities to have a greater impact, they must evolve to become more integrated with teaching methods, fostering active, experiential, and collaborative learning. Universities should focus not just on building modern facilities but also on ensuring these facilities are effectively utilized to support competency development.

We recommend revamping learning spaces to convert traditional classrooms into flexible, technology-driven learning environments that support both collaborative and individual work. Training the faculty, to know how to integrate modern facilities into their teaching to maximize the potential of learning spaces. Student engagement and encourage students to utilize facilities through project-based learning, research programs, and extracurricular activities.

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