

## The Role of Entrepreneur Knowledge and Self-Efficacy toward Technopreneurship: The Moderating Effect of Learning Strategies

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**Abstract: The Role of Entrepreneur Knowledge and Self-Efficacy toward Technopreneurship: The Moderating Effect of Learning Strategies.** **Objective:** To determine the effect of entrepreneur knowledge and self-efficacy on technopreneurship which is moderated by the learning strategy of Universitas Negeri Medan students. **Method:** This research was done using a quantitative approach with a survey method. The study population was students of the faculty of economics, the sample technique was random sampling and the number of selected samples was 198 respondents. Questionnaires were used to collect data from research participants for 15 days. The data were analyzed using moderate regression analysis (MRA) using SPSS. **Findings:** entrepreneur knowledge has a positive and significant effect on technopreneurship, self-efficacy has a positive and significant effect on technopreneurship. Learning strategy moderate the influence of entrepreneur knowledge on tecunopreursip Furthermore, the learning strategy also moderates the effect of self-efficacy on technopreneurship. **Conclusion:** These findings imply that university managers, faculty, and entrepreneurship centers to review the intensity of technopreneurial activities so that students can benefit from these programs. Focusing more on direct experience rather than theory or classroom lectures will help students to understand more about technoprenership and thus choose technopreneurship as their career.

**Keywords:** entrepreneur knowledge, self-efficacy, technopreneurship, learning strategies.

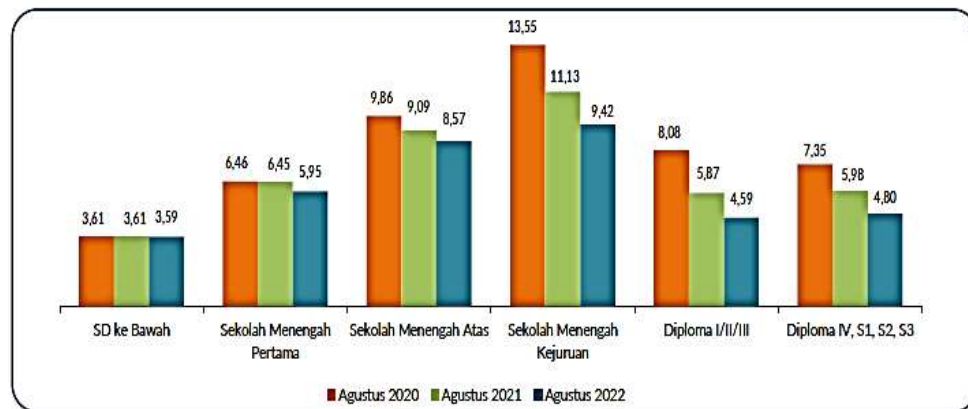
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## ■ INTRODUCTION

Unemployment in Indonesia is a complex and multidimensional problem. Several external causal factors include a lack of job availability, low growth in job opportunities compared to workforce growth, urbanization, low economic growth, and economic inequality. The following is data on the Open Unemployment Rate (TPT) According to the Highest Education Graduated (percent) August 2020-August 2022 as shown in the graph below.

When viewed based on the highest education completed by the workforce, the TPT in August 2022 has almost the same pattern as August 2021. In August 2022, the TPT of Vocational High School graduates was still the highest compared to graduates of other levels of education, which was 9.42 percent. Meanwhile, the lowest TPT was elementary school education and below, which was 3.59 percent. Compared to August 2021, the decline in TPT occurred in all education categories with the largest decline



**Figure 1.** Open unemployment rate according to highest education graduated (percent) august 2020-august 2022. Source: BPS (2022)

in the Vocational High School education category, which was 1.71 percentage points. The current problem is that educated people have a low level of entrepreneurial intention, especially students who said that this problem occurs due to difficulty finding ideas in starting a business, limited capital with the shadow of the risk of failure. The low digital entrepreneurial intention of students can cause graduates to be more oriented towards finding work even though they have to wait for a long waiting period for work, which will have an impact on increasing the number of unemployed in Indonesia (Nurhayati & Lestari, 2022). Basically, technopreneurship is one strategy to overcome the problem of unemployment by improving the quality of human resources in mastering science and technology. To become a technopreneur requires individuals who are innovative and able to master information and communication technology (Koe et al., 2018). Technopreneurs are essential in driving the development of cutting-edge technology, bridging gaps between countries and cultures, and reshaping the world as it transitions into virtual reality (Siallagan, 2023). Technopreneurs are technically fluent and able to see opportunities in high-tech or high-value-added products and processes (Mohannak & Matthews, 2015).

Technology entrepreneurship is truly a global phenomenon as more and more countries and policymakers recognize the economic development power of entrepreneurship, and the transformative potential of technology entrepreneurship in particular. Technology entrepreneurs will continue to drive the global economy and disrupt industries that are not growing quickly enough to serve changing markets. The role of innovation in technology entrepreneurship cannot be underestimated (Duening et al., 2020).

It is further recommended that the development of technopreneurs needs to be supported by increasing human resources who have technological competence in starting a business or in its development. Increasing the ability of technopreneur human resources begins in the process of learning entrepreneurship in schools, both in public schools and vocational schools through technology - based entrepreneurship curriculum (Pratio et al., 2022). Likewise, at the tertiary level, it has an important role to encourage and increase the number of entrepreneurs in Indonesia. College graduates are expected to become job creators, not job seekers (Suryowati et al., 2022). This is one of the efforts that can be made by universities to encourage a

lecture system that encourages the birth of new entrepreneurs who have adequate entrepreneurial knowledge to start a business. Entrepreneurial knowledge is described as a concept, skill, and mentality used by entrepreneurs (Roxas et al., 2009). This knowledge can be obtained and developed through consistent exposure to entrepreneurial activities. Therefore, entrepreneurial learning is associated with the development of entrepreneurial knowledge (Tshikovhi & Shambare, 2015). The primary role of entrepreneurship education is to provide knowledge about entrepreneurship to students, while its secondary role is to equip students with the skills needed in entrepreneurship (Karyaningsih et al., 2020).

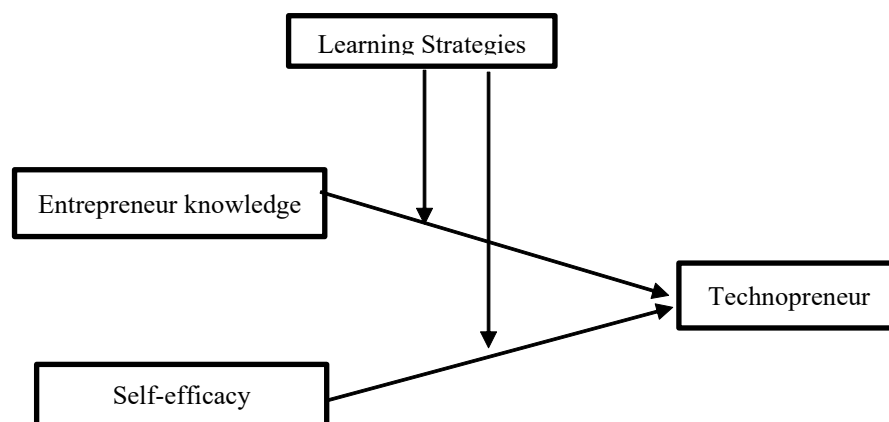
Previous research provides information that entrepreneurial knowledge has a direct effect on digital entrepreneurial intentions (Kusumaningrum et al., 2022). This is reinforced by the results of other studies showing that entrepreneurial knowledge has a positive and significant effect on technopreneurship (Wijayanto et al., 2023). However, the results of different studies explain that entrepreneurial knowledge was found to negatively affect the relationship between perceived behavioral control and entrepreneurial intentions, both in the short and long term. These findings do not provide evidence that entrepreneurial knowledge affects the relationship between subjective norms and entrepreneurial intentions, as well as attitudes and entrepreneurial intentions. Despite integrated interventions to integrate entrepreneurship education in higher education institutions, the transition of graduates from universities to entrepreneurial activities is still not significant (Ilomo & Mwantimwa, 2023). This is what still raises doubts, the results of previous studies still show inconsistent results among researchers, thus encouraging further research. In addition to entrepreneurial knowledge, self-efficacy is the belief that one of the skills they have to take certain actions to achieve something.

This study shows that self-efficacy influences students' entrepreneurial interest or has a role in students' entrepreneurial interest. This finding supports (Marini & Hamidah, 2014) research on self-efficacy influencing Entrepreneurial Interest. This is also in line with research (Ningrum & Kadani, 2023) which also states that partially there is an influence of Self-Efficacy on Digital Entrepreneurial Interest. Also strengthened by research conducted by (Andika & Madjid, 2012) which states that attitude and self-efficacy variables partially have a significant effect on entrepreneurial intention in students of the Faculty of Economics, Unsyiah. Likewise, the results of research (Christianto & Tunjungsari, 2023) show that creativity and self-efficacy have a positive and significant influence on entrepreneurial intention. Meanwhile, creativity and self-efficacy moderated by social support do not have a significant effect on entrepreneurial intention in students in Jakarta. But it is not in line with research (Wijaya, 2008) stating that there is no influence of self-efficacy on entrepreneurial intention. This can explain that students actually have quite high self-efficacy, but are less able to accept failure, even though entrepreneurship must have a spirit of daring to take risks (failure). Another finding from this study is that the variables of entrepreneurship education and self-efficacy have an effect on students' interest in entrepreneurship. This shows that entrepreneurship education and self-efficacy will provide indirect experience for someone to have an interest in entrepreneurship, because at least someone or a student has knowledge of how to run a business, how to deal with problems in business, how to market products or services, how to access capital and so on. In addition, one of the functions of education is to shape the attitudes and orientation of students towards learning, using the right learning strategies to instill knowledge and develop learning skills effectively. The teacher's experience in the learning process

influences the learning strategies used (Aini & Sudira, 2015). In achieving learning goals, learning strategies are needed so that students can easily understand the learning material provided. Regarding learning objectives, educational strategy is one aspect that needs to be considered including in planning learning to implementing learning. So to achieve the goals of entrepreneurship education, an effective learning strategy is needed to create an entrepreneur in society (Nugraha, 2017). According to Slameto (1991:90) strategy is a plan on how to utilize and use existing potential and facilities to increase effectiveness and efficiency (teaching). Likewise, in the application of entrepreneurship learning in

education, learning strategies are needed to help the entrepreneurship learning process so that entrepreneurial knowledge can grow optimally.

The results of the study (Bustos et al., 2022) provide useful information about learning strategies and entrepreneurial attitudes that contribute up to 20% of the variance in entrepreneurial intentions. The learning strategies most related to entrepreneurial attitudes are those related to creativity, transference, and self-assessment of performance. This study provides evidence for the first time on the predictive power of several learning strategies on entrepreneurial attitudes related to entrepreneurial intentions.



**Figure 2.** Proposed structural model

The results of previous studies allow us to formulate the following research hypothesis:

- H1: Entrepreneur knowledge has a significant effect on technopreneurship
- H2: Self-efficacy has a significant effect on technopreneurship
- H3: Learning strategies moderate the effect of entrepreneur knowledge on technopreneurship
- H4: Learning strategies can moderate the effect of self-efficacy on technopreneurship

## ■ METHOD

### Participants

The population in this study were students of the Faculty of Economics, State University of Medan from four educational study programs, namely the study program of economics education, business education, accounting education, office administration education totaling 1318. The sampling technique used simple random sampling. The number of samples in this study was 15% of the research population and

the number of selected samples was 198 respondents.

### **Research Design**

This study uses a quantitative approach with a survey method. The advantage of this research approach is understanding how entrepreneurial knowledge and self-efficacy influence technopreneurs moderated by learning strategies. Data collection using questionnaires, then data analysis is carried out through the stages of data coding, filtering appropriate data, analyzing data, interpreting data and making conclusions.

### **Instruments**

The instrument used in this study was a questionnaire, for the technopreneurship variable consisting of 4 indicators consisting of understanding technopreneurship, knowing the characteristics and basic nature of technopreneurs, optimizing the advancement of information technology, technopreneur profiles with 15 statement items. The entrepreneur knowledge variable consists of 6 indicators consisting of indicators of basic entrepreneurial knowledge, knowledge of business ideas and opportunities, knowledge of business aspects, benefits of entrepreneurial knowledge, the role of entrepreneurial knowledge in simplifying problems, the role of entrepreneurial knowledge in improving the dignity of life adopted from research (Puspitaningsih, 2014) which was developed into 16 statement items. Furthermore, the self-efficacy variable consists of 4 indicators consisting of confidence in solving problems with one's own efforts, confidence in solving difficult problems, self-confidence in completing tasks and resilience in completing tasks which were developed into 15 statement items. Furthermore, the learning strategy variable consists of 3 indicators consisting of learning objectives, sequence of content or learning materials and learning management which were developed into 15 statement items adopted from research

(Sapuadi, 2019). The instrument was first tested on 30 respondents and then a validity test was conducted using product moment correlation and reliability testing using Cronbach Alpha. The data collection method used a questionnaire distributed via google form distributed to selected samples.

### **Data Analysis**

The data analysis technique used in this study is the moderation variable regression analysis. This technique is used to determine the effect of independent variables on dependent variables and to determine the effect of moderating variables on the relationship between independent variables and dependent variables. This study uses Moderate Regression Analysis (MRA). Data testing in this study uses the Statistical Package for The Social Science (SPSS) version 21.0 for Windows. Before the data is processed and analyzed in the moderation variable regression analysis, a classical assumption test is first carried out which includes the normality test and the multicollinearity test.

## **■ RESULT AND DISCUSSION**

A model that is considered good is a model that meets the classical assumption test and has no constraints in it. The classical assumption test includes normality, multicollinearity, and heteroscedasticity tests. Then a normality test is also carried out with the criteria if the  $asymp.sig$  value is more than 0.05. Based on the results of the Kolmogorov-Smirnov statistical test, the data on the entrepreneur knowledge variable, self-efficacy variable, learning strategies variable and technopreneur variable have a significance value of more than 0.05 so that it can be said that the data is normally distributed. The test results show that the variance inflation factor (VIF) value of the entrepreneur knowledge variable (X1) is 1,845 smaller than 10, the Self-efficacy variable is 5.552 ( $< 10$ ) and the learning strategies variable (Z) is 5.044 ( $< 10$ ), meaning that all independent variables not have symptoms of multicollinearity.

**Table 1.** Normality analysis

	Entrepreneur Knowledge	Self-efficacy	Leraning Strategies	Technopreneur
Kolmogorov-Smirnov	1.077	2.390	2.233	2.870
Asymp. Sig. (2-tailed)	.000	.000	.000	.000

a. Test distribution is Normal.

**Table 2.** Multicollinearity analysis

Model	Coefficients	Std. Error	Tolerance	VIF
Constant	45.457	.323		
Entrepreneur Knowledge (X1)	.080	.051	.542	1.845
Self-efficacy	.295	.068	.180	5.552
Learning Strategies	.469	.055	.198	5.044

**Table 3.** Hypothesis analysis

Independent Variable	Varibel Dependen								
	Y (i)			Y (ii)			Y (iii)		
	C	t-Stat	Sig	C	t-Stat	Sig	C	t-Stat	Sig
Constant	45.458	120.012	.000	45.948	120.076	.000	46.091	109.975	.000
X1	0.118	1.996	.047	0.122	2.422	.016	-	-	-
X2	0.775	16.880	.000	-	-	-	0.276	4.061	.000
Z	-	-	-	0.627	17.863	.000	0.458	8.387	.000
X1*Z	-	-	-	-0.007	-2.597	.010	-	-	-
X2*Z	-	-	-	-	-	-	-0,005	-2,349	0.020
Adjusted	0.756			0.812			0.825		
R <sup>2</sup>	0.758			0.815			0.828		

### H<sub>1</sub>: Entrepreneur knowledge has a significant influence on technopreneurship

Based on the results of multiple regression analysis to see the influence of the entrepreneur knowledge (X1) and self-efficacy (X2) variables before entering the moderation variables as in table Y (i) the entrepreneur knowledge variable (X1) has a sig. value of 0.047 (p-value <0.05) with a regression coefficient of 0.118 which means that entrepreneur knowledge has a positive and significant effect on the technopreneurship variable. The results reveal that entrepreneur

knowledge has an influence on technopreneurs. Entrepreneurial knowledge represents the ability of potential entrepreneurs to recognize opportunities and pursue them. With this knowledge, prospective entrepreneurs are able to understand, estimate, interpret, and apply new information in new ways - activities that are the core of entrepreneurship (Roxas, 2014) In general, greater knowledge will directly provide greater awareness of the existence of these professional career choices, so that the intention to become an entrepreneur becomes more

credible (Linan, 2004 in Farani et al., 2017). Entrepreneurial knowledge is a person's ability to produce something new through creative thinking and innovative actions to create ideas or opportunities that can be utilized into something useful. Adequate entrepreneurial knowledge is expected to be able to change the mindset, not only to become a job seeker but also to provide jobs for others. Entrepreneurial knowledge is one of the factors that triggers interest in entrepreneurship (Waldyatri et al., 2021). The quote above explains that entrepreneurial knowledge is a person's ability to produce something new through creative thinking and innovative actions to create ideas or opportunities that can be utilized for good. Adequate entrepreneurial knowledge is expected to be able to change the mindset, not only to become a job seeker but also to provide jobs for others. Entrepreneurial knowledge is one of the factors that triggers interest in entrepreneurship. Entrepreneurial knowledge has been confirmed as a dominant variable in stimulating the birth of start-up companies and the development of new businesses (Wibowo & Narmaditya, 2022). greater knowledge will directly provide greater awareness of the existence of these professional career choices, so that the intention to become an entrepreneur becomes more credible Linan, 2004 in (Farani et al., 2017). The results of this study indicate that entrepreneurial knowledge has a positive and significant effect on technopreneurship (Wijayanto et al., 2023). From several opinions above, it can be concluded that entrepreneurial knowledge is all forms of information from the results of the learning process experienced which are processed and processed in the cognitive realm in the form of memories and understanding of entrepreneurship so as to create courage in taking risks rationally and logically in designing a business or in running a business.

## **H<sub>2</sub>: Self-efficacy has a significant influence on technopreneurship**

The self-efficacy variable (X2) has a sig. value of 0.000 (p-value <0.05) with a regression coefficient of 0.775, which means that self-efficacy (X2) has a positive and significant effect on the technopreneurship variable. Based on the results of the regression analysis, it was found that entrepreneurial knowledge has an influence on technopreneurs. Entrepreneurial self-efficacy is considered to be the factor that has the greatest influence on entrepreneurial intention, individuals who have higher entrepreneurial self-efficacy beliefs tend to become entrepreneurs Yang, 2019 (Darmanto et al., 2022). In this case, entrepreneurial self-efficacy is considered to be the factor that has the greatest influence on entrepreneurial intention, individuals who have higher entrepreneurial self-efficacy beliefs tend to become entrepreneurs. The findings of this study indicate that self-efficacy can strengthen the influence of entrepreneurship education and community support on digital entrepreneurial intentions. Entrepreneurship learning and self-efficacy together have a significant effect on the desire for technopreneurship with the concept of a creative economy in students of the Economics Education study program, Bhinneka PGRI University, Tulungagung, Academic Year 2020/2021 (Triani & Rindrayani, 2021). According to Chen et al. (1998), entrepreneurial self-efficacy has a positive effect on the intention to start their own business. It was found that business founders have higher self-efficacy in innovation and risk taking than non-founders. The results of this study indicate the potential for entrepreneurial self-efficacy as a characteristic of entrepreneurship. The results of the study show that the implementation of the Tri Hita Karana culture and self-efficacy have a positive contribution to the growth of technopreneurship intentions among students of the Informatics Management Study

Program (Kertiasih et al., 2021). Another study based on the results of his study revealed that technopreneurship intentions are influenced by self-efficacy related to information and communication technology which includes self-efficacy in the ability to master computers and internet resources (Koe et al., 2018). Based on the discussion above, this study supports the results of previous studies where in this case the self-efficacy variable has a positive and significant effect on the technopreneur variable. Thus, it can be concluded that if there is an increase in student self-efficacy, the student's desire to become a technopreneur will also increase.

### **H<sub>3</sub>: Learning strategies as a moderating factor of the influence of entrepreneur knowledge on technopreneurship**

The results of the moderate regression analysis (MRA) stage 1 as seen in table Y (ii) obtained the results that the Z variable, which is a moderating variable, successfully moderated the influence of the entrepreneur knowledge variable (X1) on technopreneurship (Y) after entering the interaction of the X1\*Z variables with a sig. value of 0.010 (p-value <0.05) meaning that this study found a moderating effect of learning strategies in the influence of entrepreneur knowledge on technopreneurs.

Based on the regression results above, it was found that learning strategies moderate the influence of entrepreneur knowledge on technopreneurs. Learning strategies that are more related to entrepreneurial attitudes are strategies that are close to creativity, transference, and context control. Understanding learning styles that lead to higher entrepreneurial attitudes is essential to achieving efficiency in educational programs aimed at promoting business ventures (Bustos et al., 2022). This study provides useful information about learning strategies and entrepreneurial attitudes that contribute up to 20% of the variance in entrepreneurial intentions. The learning most

related to entrepreneurial attitudes is that related to creativity, transference, and assessment of one's performance.

Entrepreneurial knowledge is an instrument used to enhance entrepreneurial activity. This is needed to create an effective and successful sustainable business. Entrepreneurial knowledge is considered a key element of entrepreneurial activity and the foundation for building a new business. This is because entrepreneurial knowledge has a major impact on entrepreneurial intentions that lead to individual, organizational, and national success through economic sustainability. (Hussain et al., 2021). Entrepreneurial knowledge has been confirmed as a dominant variable in stimulating the birth of startups and the development of new businesses (Wibowo & Narmaditya, 2022). Technopreneurship can develop well if there is a partnership between industry, academia and government through education, training, and workshops to achieve competitive advantage (Walker, 2012). From the opinions above, it can be concluded that entrepreneurial knowledge is all forms of information from the results of the learning process experienced which are processed and processed in the cognitive realm in the form of memories and understanding of entrepreneurship so as to give rise to the courage to take risks rationally and logically in designing a business or in running a business.

### **H<sub>4</sub>: Learning strategies as a moderating factor of the influence of self-efficacy on technopreneurship**

In the moderate regression analysis test stage 2 after entering the interaction of variables X2\*Z, a moderating effect of learning strategies was also found in the influence of self-efficacy on technopreneurship with a sig. value of 0.020 (p-value <0.05), which means that the learning strategy variable is able to moderate the influence of self-efficacy on technopreneurship. Based on



the results of the data analysis, it was found that learning strategies can moderate the influence of self-efficacy on technopreneurship. This is in line with research conducted by (Triani & Rindrayani, 2021) which also found that there was a significant influence of self-efficacy on the desire for technopreneurship with the concept of a creative economy in students of the Economics Education study program, Bhinneka PGRI University, Tulungagung, Academic Year 2020/2021. Self-efficacy has a positive contribution to the growth of technopreneurship intentions among students of the Informatics Management Study Program (Kertiasih et al., 2021). The results of the study showed a moderate correlation ( $r = 0.59$ ,  $p < 0.001$ ) between the learning strategy scale and academic self-efficacy. The results of the hypothesis test, students who reported greater use of learning strategies were those who showed greater self-efficacy in completing academic tasks related to higher education (Martins & Santos, 2019). Strengthened by the results of the study which showed that students can develop technopreneurship intentions as a result of technopreneurship self-efficacy, which is a strong belief in their ability to perform the required technological and entrepreneurial tasks (Salhieh & Al-Abdallat, 2021). Thus, it can be understood that the results of this study are in line with research conducted by previous researchers. Therefore, an appropriate learning strategy is needed to increase student self-efficacy so that it can become a driving factor in fostering students' intentions to become technopreneurs so that they can overcome the problem of unemployment.

## ■ CONCLUSION

Based on the results of the study, it can be concluded that entrepreneurial knowledge has a positive and significant effect on technopreneurs, self-efficacy also has a positive and significant effect on technopreneurs. Learning strategies moderate the effect of entrepreneurial knowledge on technopreneurs. Furthermore, learning

strategies also moderate the effect of self-efficacy on technopreneurs. Furthermore, seen from the R Square value, information is obtained that before the moderation variable is entered, the  $R^2$  value is 0.758, meaning that the effect of the independent variable on the dependent variable is 75.8%. Furthermore, after entering the stage I moderation variable in the  $X1.Z$  model, the  $R^2$  value is 0.815, meaning that the effect of the independent variable on the independent variable is 81.5% and after entering the stage II moderation variable in the  $X2.Z$  model, the  $R^2$  value is 0.828, meaning that the effect of the independent variable on the independent variable is 82.8%. This means that there is an increase in the contribution of 5.7% of the effect of the moderation variable on the effect of entrepreneurial knowledge on technopreneurship. While the increase in the contribution of 7% of the effect of the moderation variable on the effect of self-efficacy on technopreneurship.

Based on these findings, it is time for university administrators, faculties, and entrepreneurship centers to review the intensity of technopreneurial activities so that students can benefit from these programs. Focusing more on hands-on experience rather than theory or lectures in class will help students to understand more about technopreneurship and thus choose technopreneurship as their career. This study only focuses on students of entrepreneurship courses in the faculty of economics which is the main limitation of this study. Therefore, it is interesting to explore other faculties in different universities to see the technopreneurial interests of their students. Further research should include technopreneurial education, competency, and orientation in one model to obtain a comprehensive technopreneurial intention model.

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