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Entrepreneurial Education and Its Influence on Value Creation Competencies in Students from a Peruvian Public University

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ABSTRACT

This research study aimed to determine the impact of an Entrepreneurial Education (EE) Program on the entrepreneurial competencies for value creation among students at Universidad Nacional Mayor de San Marcos (UNMSM). A quantitative experimental design was used. A survey was administered to a randomly selected sample before and after implementing the EE program. The data were analyzed using SPSS, and inferential analyses were conducted using non-parametric correlation tests based on Spearman's rho statistic, along with the R-squared coefficient in a multiple regression analysis. The results indicated a very strong correlation between the EE program and entrepreneurial competencies for value creation. The multiple regression analysis revealed that the entrepreneurial attitude was the most significant contributor to the model, although it exhibited the least growth. In contrast, entrepreneurial aptitude demonstrated greater growth. Entrepreneurial aptitude and attitude positively affect the competencies related to creativity and innovation. This research is a valuable resource for leaders and managers of entrepreneurship centers and business incubators in public universities across the Andean region.

Keywords: entrepreneurial education, entrepreneurial competencies, value creation, entrepreneurial attitude, innovation.

INTRODUCTION

Interest in entrepreneurial education (EE) at universities is growing because it prepares graduates to thrive in a labor market that highly values strengthening business processes, anticipating customer needs, and introducing innovative ideas (Yi & Duval-Couetil, 2022). As Aldianto et al. (2018) suggest, EE programs should be integrated into university curricula to help students learn to create value, thereby increasing the number of young entrepreneurs and fostering the establishment of innovative companies. However, in Peru, EE programs are still in the early stages of development within university curricula, and there is also a lack of evaluation regarding their effectiveness in building student competencies (Sánchez et al., 2017).

Universities have recognized the importance of fostering the personal development of students through EE programs. Although investments in EE impact entrepreneurial skills, they do not necessarily lead to a higher rate of entrepreneurship among students. In this context, Universidad Nacional Mayor de San Marcos (UNMSM) has implemented an EE program with an experiential and interdisciplinary approach through its 1551 Innovative Business Incubator, which views entrepreneurship as the creation of novel value for external stakeholders. However, to provide solid evidence to sustain, improve, standardize, and scale this initiative, the program's outcomes in terms of student entrepreneurial competencies need to be assessed.

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Most research on EE is based on findings from developed countries, which do not reflect the context of emerging countries (Jones et al., 2018). Furthermore, studies on the outcomes or impact of most EE programs typically measure entrepreneurial self-efficacy, entrepreneurial behavior, and entrepreneurial intention among university students, often focusing on the establishment of companies or organizations (Lackéus, 2020). Moreover, these studies usually report mixed or contradictory findings. Therefore, the relevance and novelty of this study lies in investigating EE as a means of value creation, providing new insights into the impact of EE programs on students' entrepreneurial competencies within the context of a public university in the Andean region.

The research results provide a support tool that can be applied in other public universities—in Peru or the Andean region—with similar characteristics, taking into account the unique aspects of their environment. This tool aims to establish entrepreneurial education (EE) programs focused on value creation, which will enhance the competencies of students and improve their integration into society as "entrepreneurial" employees within an organization or as "entrepreneurial" business owners who create jobs for others.

The objective of this research study was to determine the influence of an EE program on the entrepreneurial competencies of UNMSM students in Peru in terms of value creation. To this end, the following general research hypothesis was proposed: An EE program (ENT_EDU) influences the entrepreneurial competencies of UNMSM students for value creation (ENT_COM).

Background

Research conducted by Mets et al. (2017) at five Estonian Higher Education Institutions (HEIs), applying the European Competence Framework based on the knowledge-skills-attitudes triad, noted that students with higher aspirations to become entrepreneurs before entering a HEI perceived their entrepreneurship knowledge, skills, and various affective outcomes to be stronger.

A study conducted at one university in Malaysia found that EE positively impacts the entrepreneurial competencies of students and recent graduates. It was noted that students rated certain skills (such as creativity, analysis, motivation, networking, and adaptability) and entrepreneurial attitudes (such as self-efficacy and need for achievement) higher than those of graduates (Rusok et al., 2017). However, findings from Ismail et al. (2019) at another Malaysian university indicated that the effectiveness of entrepreneurship programs had only a moderate positive correlation with the development of entrepreneurial skills of students in technical universities. Among these, communication skills scored the highest, whereas management skills scored the lowest.

A study conducted at three public universities in Indonesia confirmed that EE positively influences students' entrepreneurial self-efficacy and attitudes toward entrepreneurship; however, it failed to promote students' intention to become entrepreneurs (Kusumojanto et al., 2020). In a separate study at universities in Bandung, Indonesia, Aldianto et al. (2018) found that the processes involved in the EE program—including objective, content, and teaching method—have a positive and significant impact on its outcomes such as entrepreneurial knowledge, entrepreneurship, and entrepreneurial behavior.

In Rwanda, Nshimiyimana et al. (2018) examined the effect of incorporating an EE module into the curricula for non-business majors at the Institut d'Enseignement Supérieur du Ruhengerien. Their findings indicated that "innovation" was the personal entrepreneurial characteristic with the highest statistical significance compared to the other dimensions examined in undergraduate students.

Entrepreneurial Education Focused on Value Creation

Three terms are often used interchangeably in the literature to refer to EE: enterprise education, entrepreneurship education, and entrepreneurial education. Although these terms are similar, they have differences. According to the UK Quality Assurance Agency for Higher Education (QAA), "enterprise education" refers to the process of developing the ability to generate ideas, along with the behaviors, attributes, and competencies needed to bring them to fruition. In contrast, "entrepreneurship education" focuses on harnessing the entrepreneurial skills of students who are capable of identifying opportunities and developing ventures, becoming self-employed, establishing new businesses, or developing and growing existing ones. Lastly, "entrepreneurial education" serves as an umbrella term that encompasses both of the above terms and may be used when discussing the combination of both (QAA, 2018, p. 9).

In addition, Gautam and Singh (2015) defined EE "as the process of professional application of knowledge, attitudes, skills and competencies"

(p. 24), suggesting that EE extends beyond self-employment or business creation. Similarly, the Danish Foundation for Entrepreneurship points out that EE includes "Content, methods and activities that support the development of motivation, skill and experience, which make it possible to be entrepreneurial, to manage and participate in value-creating processes" (Moberg et al., 2015, p. 14).

Entrepreneurial education has become a means to educate the workforce for the 21st century by providing students with the necessary skills and attitudes to be creative, innovative, and entrepreneurial in any field or discipline (Welsha et al., 2016). In other words, it aims to empower them to create diverse forms of value, including economic, social, environmental, and more. In line with this vision, the European Union proposes a framework of three dimensions (knowledge, skills, and attitudes) for designing EE programs tailored to develop entrepreneurial individuals. For this study, this framework has been adapted to focus on two dimensions:

a. *Entrepreneurial Aptitude*

Cubico et al. (2010) define entrepreneurial aptitude as the "potential toward creating and developing enterprise and self-employment" (p. 427). They developed a test based on eight factors: goal orientation, leadership, adaptability, need for achievement, need for empowerment, innovation, flexibility, and autonomy. Additionally, aptitude and knowledge are linked to the operations of a business, such as product development, customer satisfaction, and business and financial strategy; applying knowledge and using business know-how requires specific skills (Costin et al., 2022). In this research, entrepreneurial aptitude encompasses the knowledge and skills individuals need to engage in an entrepreneurial process that does not necessarily involve starting a business.

b. *Entrepreneurial Attitude*

According to Kusumojanto et al. (2020), "entrepreneurial attitude is the tendency to react appropriately in response to risks that will be faced in a business" (p. 457). Other authors suggest that entrepreneurial attitudes "signify the extent one learns to become an entrepreneur" (Rusok et al., 2017, p. 435). Following this premise, Liñán and Chen (2009) define entrepreneurial attitude as "a positive or negative personal valuation about being an entrepreneur" (p. 596). These definitions relate the entrepreneurial attitude to the will, inclination, mindset, and essential characteristics needed for entrepreneurial activities.

Entrepreneurial Competencies for Value Creation

Bacigalupo et al. (2016) suggest that entrepreneurship involves acting on ideas and opportunities to create value for others. This value can be economic, cultural, or social. Their view is complemented by Gianesini et al. (2018), who argue that entrepreneurial behavior requires a proactive commitment to innovation in the pursuit of solutions that generate social and economic value.

From a different perspective, Martínez-Martínez and Ventura (2020) define entrepreneurial competencies as the "knowledge, experiences, skills, and attitudes, which enable and favor the success of entrepreneurial activities" (p. 4). Essentially, entrepreneurial activity serves as a mechanism to enhance students' transversal competencies through diversity, interdisciplinarity, and experience, ultimately improving their access to the labor market.

In turn, Bruyat (1993) explores value creation in EE by providing a definition based on two dimensions: the novelty of the value created and the impact of the process on the individual. As such, the entrepreneur is responsible for the process of creating novel value, underlining the importance of developing their entrepreneurial competencies. Based on this reasoning, two key dimensions of entrepreneurial competencies that contribute to value creation can be identified:

a. *Creativity Competence*

There are many definitions of creativity due to the various disciplines that study it. However, it can generally be understood as "a combination of novelty and appropriateness and has been associated with problem-solving and novelty generation" (Berglund and Wennberg, 2006, p. 368). This definition aligns with that of Rusok et al. (2017), who note that creativity is a crucial driver for companies that strive to innovate continuously.

b. *Innovation Competence*

The Massachusetts Institute of Technology's Innovation Initiative defines innovation as the "process of taking ideas from inception to impact" (Budden and Murray, 2019, p. 3). In other

words, innovation is a temporary process that occurs between the initial idea and its eventual resulting impact, which arises from addressing a problem and providing a solution. It is important to recognize that the impact of innovation goes beyond commercial benefits. From an educational perspective, Rump et al. (2013) describe it as "the implementation of something new which works and which has a value (in the broadest possible sense) for someone (e.g. a user group)" (p. 4). Otherwise stated, innovation must work effectively, the value created must surpass purely economic considerations, and its intended audience must validate it.

Based on this review of the literature, the following specific hypotheses were proposed:

- Specific hypothesis 1: The entrepreneurial aptitude (ENT_APT) of students in an entrepreneurial education program influences their entrepreneurial competencies for value creation (ENT_COMP).
- Specific hypothesis 2: The entrepreneurial attitude (ENT_ATT) of students in an entrepreneurial education program influences their entrepreneurial competencies for value creation (ENT_COMP).

METHODOLOGY

An applied research approach was used for this study. It was explanatory as it measured the degree of influence between variables to determine the causes of the phenomenon and assess its effects on the dependent variable “entrepreneurial competencies for value creation” among UNMSM students (Hernández & Mendoza, 2018).

The research design was quantitative and included experimental and quasi-experimental elements because data regarding facts and phenomena were collected at two distinct points in time: before and after the implementation of the EE program. This approach was used to analyze the incidence of the program.

The population comprised all 30 647 students enrolled in the 2020-I academic period across the professional schools of UNMSM. Using a probability sampling technique, a sample size of 380 students was determined and selected through simple random sampling, which included participants from the EE program.

Data was collected using a 5-point Likert scale questionnaire designed to gather information on 30 indicators related to the study variables. The questionnaire was validated through expert judgment to ensure the clarity, relevance, and appropriateness of the questions. Furthermore, a reliability test was conducted using Cronbach’s alpha (see Table 1), revealing that the questionnaire exhibited excellent internal consistency between the data collected and the questions directed at the study sample.

Table 1. *Reliability Statistics.*

Cronbach’s Alpha	No. of Items
.937	30

Source: Prepared by the authors.

The questionnaire was administered at two distinct points in time (before and after the EE program), using Google Forms. A total of 1 173 responses were collected for the pretest and 744 for the post-test. After filtering, 712 valid records remained. The data were analyzed using the SPSS/PC statistical package software, where the necessary calculations were performed for the inferential analysis of each variable and its dimensions. This included normal distribution tests, non-parametric correlation tests, and linear regression analysis.

RESULTS

Normality Testing

Given that the sample size exceeded 50 data points, the Kolmogorov-Smirnov statistic was used to test for normality. As shown in Table 2, both variables exhibit a significance level of 0.000, which is less than the threshold of 0.05. This indicates that neither of the variables conforms to a normal distribution and suggests the need for non-parametric tests.

Table 2. *Kolmogorov-Smirnov Test.*

Test of Normality	Kolmogorov-Smirnov[a]		
	Statistic	df	Sig.
EDU_EMP	.060	712	.000
COM_EMP	.072	712	.000

[a]Lilliefors Significance Correction.

Source: Prepared by the authors.

General Hypothesis Testing

Table 3 summarizes the results from the two moments of the study, using Spearman’s rho statistic. The hypotheses were defined as follows:

- H_0: There is no correlation between the variables under study (Independent Variable: ENT_EDU; Dependent Variable: ENT_COM).
- H_1: The is a correlation between the variables under study (Independent Variable: ENT_EDU; Dependent Variable: ENT_COM).
- Significance level = α = 0.05 or 5%.

Table 3. *Spearman's Rho Correlation for the General Hypothesis.*

Spearman's Rho	Pretest		Posttest	
	Statistic	Sig.	Statistic	Sig.
ENT_EDU/ ENT_COM	.764**	< 0.001	.850**	< 0.001

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

Source: Prepared by the authors.

As the significance value obtained is less than 0.05, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted. Therefore, there is a correlation between the study variables, which is also highly significant as the value is below 0.01. Notably, before the implementation of the EE program, there was a considerable positive correlation (0.764), which increased to a very strong positive correlation (0.850) by the end of the program.

In addition, a multiple regression test was conducted to determine the degree of influence between the variables or dimensions of the study. The hypotheses were defined as follows:

- H_0: There is no cause-effect relationship between the variables under study (Independent Variable: ENT_EDU; Dependent Variable: ENT_COM).
- H_1: There is a cause-effect relationship between the variables under study (Independent Variable: ENT_EDU; Dependent Variable: ENT_COM).
- Significance level = α = 0.05 or 5%.

The analysis of variance, presented in Table 4, indicated that the significance level of F was less than 0.05. Consequently, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted. Therefore, the model accurately explains the entrepreneurial competencies of students related to value creation and is statistically significant.

The results further indicated that the model improved its predictive ability by the end of the program, as the F-value nearly doubled, increasing from 615.133 to 1159.562. Additionally, as shown in Table 5, the set of independent variables accounted for 63.4% of the students' entrepreneurial competencies before the EE program, and this figure rose to 76.6% upon completion of the program.

Table 6 shows that the significance level of *t* is less than 0.05, suggesting a significant relationship between the variables "entrepreneurial aptitude" and "entrepreneurial attitude" and "entrepreneurial competencies for value creation". Therefore, these variables influence and help predict entrepreneurial competencies. Both independent variables exhibit a directly proportional relationship with the dependent variable. Notably, entrepreneurial aptitude is the strongest predictor of entrepreneurial competencies, as its beta value is further from zero.

Based on the above results, a multiple regression model was constructed for both moments of the study (see Table 7), following the formula: $Y = b_0 + b_1X_1 + b_2X_2$. This model satisfied the assumptions of normality of the residuals (see Figure 1), constant variance (see Figure 2), independence (Durbin-Watson coefficient of 1.994), and multicollinearity, as shown in Table 8).

According to the model, before the implementation of the EE program, entrepreneurial attitude contributed 0.942, while entrepreneurial aptitude contributed 0.637. By the end of the program, both dimensions increased their contribution to the model. Entrepreneurial attitude rose to 0.987 and entrepreneurial aptitude to 0.718. It is important to highlight that at both moments of the study, entrepreneurial attitude contributed the most to the model, while entrepreneurial aptitude showed a greater increase in its coefficient.

Testing of Specific Hypothesis 1

The results of the analysis of variance are presented in Table 9 for both before and after the EE program. The hypotheses were defined as follows:

- H_0: There is no cause-effect relationship between the variables under study (Independent Variable: ENT_APT; Dependent Variable: ENT_COM).
- H_1: There is a cause-effect relationship between the variables under study (Independent Variable: ENT_APT; Dependent Variable: ENT_COM).
- Significance level = α = 0.05 or 5%.

The analysis of variance indicated that the significance level of F was less than 0.05. Consequently, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted. Therefore, the model accurately explains the entrepreneurial competencies of students related

Table 4. *Analysis of Variance (ANOVA) for the General Hypothesis.*

Model		Sum of Squares	df	Mean Square	F	Sig.
Pretest	Regression	26171.764	2	13085.882	615.133	.000[b]
	Residual	15082.748	709	21.273		
	Total	41254.511	711			
Posttest	Regression	31240.442	2	15620.221	1159.562	.000[b]
	Residual	9550.794	709	13.471		
	Total	40791.236	711			

a. Dependent variable: ENT_COM
b. Predictors: (Constant), ENT_ATT, ENT_APT
Source: Prepared by the authors.

Table 5. *Multiple Regression Analysis Applied to the General Hypothesis*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Pretest	.796[a]	.634	.633	461.230
Posttest	.875[a]	.766	.765	367.026

a. Predictors: (Constant), ENT_ATT, ENT_APT
Source: Prepared by the authors.

Tabla 6. *Coefficients[a] of the General Hypothesis.*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
Pretest	(Constant)	9.703	1.517		6.397	.000
	ENT_APT	.637	.027	.600	23.986	.000
	ENT_ATT	.942	.072	.328	13.117	.000
Posttest	(Constant)	5.738	1.160		4.946	.000
	ENT_APT	.718	.027	.605	27.030	.000
	ENT_ATT	.987	.059	.371	16.588	.000

a. Dependent variable: ENT_COM
Source: Prepared by the authors.

Table 7. *Multiple Regression Models Applied to the General Hypothesis.*

Pretest	Posttest
$Y = 9.703 + 0.637X_1 + 0.942X_2$	$Y = 5.738 + 0.718X_1 + 0.987X_2$

X_1: ENT_APT: Entrepreneurial Aptitude
X_2: ENT_ATT: Entrepreneurial Attitude
Y: ENT_COM: Entrepreneurial Competencies for Value Creation
Source: Prepared by the authors.

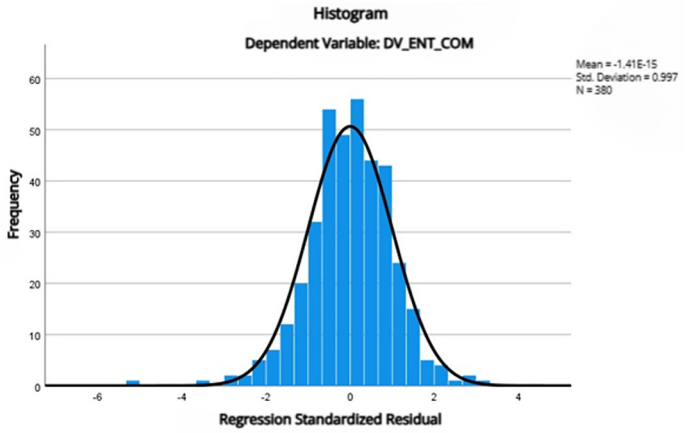

Figure 1. Histogram of Residuals.
Source: Prepared by the author.

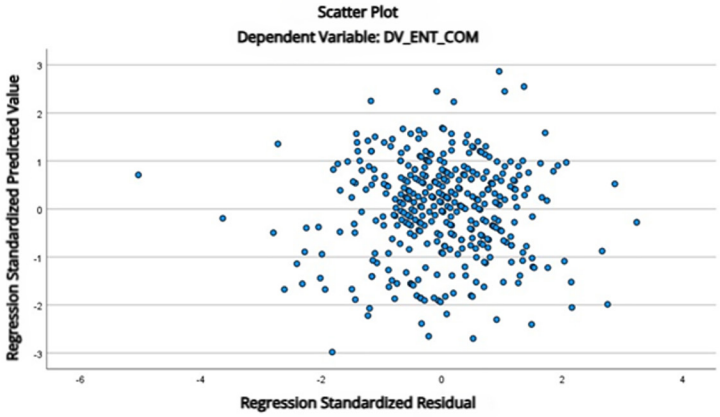

Figure 2. Homoscedasticity or Constant Variance.
Source: Prepared by the author.

Table 8. *Multicollinearity Analysis.*

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	D1_ENT_APT	.836	1.196
	D2_ENT_ATT	.836	1.196

a. Dependent variable: DV_ENT_COM.
Source: Prepared by the authors.

Table 9. *Analysis of Variance (ANOVA[a]) for Specific Hypothesis 1.*

Model		Sum of Squares	df	Mean Square	F	Sig.
Pretest	Regression	22511.603	1	22511.603	852.762	.000[b]
	Residual	18742.908	710	26.398		
	Total	41254.511	711			
Posttest	Regression	27533.920	1	27533.920	1474.588	.000[b]
	Residual	13257.316	710	18.672		
	Total	40791.236	711			

a. Dependent variable: ENT_COM
b. Predictors: (Constant), ENT_APT
Source: Prepared by the authors.

to value creation and is statistically significant. The results further indicated that the model improved its predictive ability by the end of the program, as the F-value nearly doubled, increasing from 852.762 to 1474.588. This is consistent with the results in Table 10, where the model accounted for 54.6% of the entrepreneurial competencies related to value creation before the EE program, and 67.5% upon completion of the program.

Table 11 shows that the significance level of *t* is less than 0.05, suggesting a significant relationship between the variables "entrepreneurial aptitude" and "entrepreneurial competencies for value creation". Therefore, entrepreneurial aptitude influences entrepreneurial competencies among students. After the implementation of the EE program, there is a clearer understanding regarding entrepreneurial competencies, as evidenced by the beta value, which is further from zero. The positive sign of this beta value indicates that a higher entrepreneurial aptitude correlates with enhanced entrepreneurial competencies.

Testing of Specific Hypothesis 2

The results of the analysis of variance are presented in Table 12 for both before and after the EE program. The hypotheses were defined as follows:

Table 10. *Multiple Regression Analysis Applied to Specific Hypothesis 1.*

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
Pretest	.739[a]	.546	.545	513.794
Posttest	.822[a]	.675	.675	432.114

a. Predictors: (Constant), ENT_APT
Source: Prepared by the authors.

Table 11. *Coefficients[a] of Specific Hypothesis 1.*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
Pretest	(Constant)	27.367	.777		35.203	.000
	ENT_APT	.784	.027	.739	29.202	.000
Posttest	(Constant)	19.454	.958		20.309	.000
	ENT_APT	.975	.025	.822	38.400	.000

a. Dependent variable: ENT_COM
Source: Prepared by the authors.

Table 12. *Analysis of Variance (ANOVA[a]) for Specific Hypothesis 2.*

Model		Sum of Squares	df	Mean Square	F	Sig.
Pretest	Regression	13932.790	1	13932.790	362.067	.000[b]
	Residual	27321.721	710	38.481		
	Total	41254.511	711			
Posttest	Regression	21398.282	1	21398.282	783.418	.000[b]
	Residual	19392.954	710	27.314		
	Total	40791.236	711			

a. Dependent variable: ENT_COM
b. Predictors: (Constant), ENT_ATT
Source: Prepared by the authors.

- H_0: There is no cause-effect relationship between the variables under study (Independent Variable: ENT_ATT; Dependent Variable: ENT_COM).
- H_1: There is a cause-effect relationship between the variables under study (Independent Variable: ENT_ATT; Dependent Variable: ENT_COM).
- Significance level = α = 0.05 or 5%.

The analysis of variance indicated that the significance level of F was less than 0.05. Consequently, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted. Therefore, the model accurately explains the entrepreneurial competencies of students related to value creation and is statistically significant. The results further indicated that the model improved its predictive ability by the end of the program, as the F-value nearly doubled, increasing from 362.067 to 783.418. This is consistent with the results in Table 13, where the model accounted for 33.8% of the entrepreneurial competencies related to value creation before the EE program, and 52.5% upon completion of the program.

Table 14 shows that the significance level of *t* is less than 0.05, suggesting a significant relationship between the variables "entrepreneurial attitude" and "entrepreneurial competencies for value creation". Therefore, entrepreneurial attitude influences entrepreneurial competencies among students. After the implementation of the EE program, there is a clearer understanding regarding entrepreneurial competencies, as evidenced by the beta value, which is further from zero. The positive sign of this beta value indicates that a higher entrepreneurial attitude correlates with enhanced entrepreneurial competencies.

DISCUSSION

The research results indicated a strong positive correlation (0.764) between the study variables at the beginning of the EE program. By the end of the program, this value had increased to a very strong positive correlation (0.850). These findings suggest that as students in various schools at the UNMSM receive more training and reinforcement in entrepreneurial aptitudes and attitudes of the students, their ability to improve their entrepreneurship knowledge, skills, and attitudes also grows. Consequently, students develop entrepreneur traits such as leadership, teamwork, and a capacity to take calculated risks to create and implement innovative solutions that positively impact the company and society.

These findings contrast with a study conducted in Malaysia by Ismail et al. (2019), which found that EE programs had only a moderate positive correlation with the development of entrepreneurial skills of students in technical universities. Such differences

Table 13. *Multiple Regression Analysis for Specific Hypothesis 2.*

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
Pretest	.581[a]	.338	.337	620.333
Posttest	.724[a]	.525	.524	522.628

a. Predictors: (Constant), ENT_ATT
Source: Prepared by the authors.

Table 14. *Coefficients[a] of Specific Hypothesis 2.*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
Pretest	(Constant)	10.816	2.039		5.304	.000
	ENT_ATT	1.668	.088	.581	19.028	.000
Posttest	(Constant)	10.294	1.634		6.299	.000
	ENT_ATT	1.926	.069	.724	27.990	.000

a. Dependent variable: ENT_COM
Source: Prepared by the authors.

may stem from their approach, which focused on measuring only skills instead of competencies that typically encompass the knowledge-skills-attitudes triad. Additionally, their EE program was not interdisciplinary, primarily involving students from technical fields, mostly Engineering.

The results of the multiple regression analysis demonstrated that the model effectively explains students' entrepreneurial competencies for value creation and is statistically significant, accounting for 76.6% of the variance at the end of the EE program. Supporting this, findings by Rusok et al. (2017) in Malaysia showed that EE positively influences the entrepreneurial competencies of university students, particularly certain skills (such as creativity, analysis, motivation, networking, and adaptability) and entrepreneurial attitudes (such as self-efficacy and need for achievement). Moreover, these findings align with a study in Indonesia that found that the processes involved in the EE program have a positive and significant impact on students' outcomes including their entrepreneurial knowledge, spirit, and behavior (Aldianto et al., 2018).

Entrepreneurial aptitude and attitude are significantly related to the entrepreneurial competencies of UNMSM students to create value. In other words, they positively influence these competencies. However, entrepreneurial aptitude most strongly accounts for the entrepreneurial competencies of creativity and innovation by the end of the EE program. This indicates that students, upon completing the program, understand the innovation process, know how to implement a novel solution, and are motivated to create value in their community. This result is consistent with a study conducted in Rwanda, where researchers concluded that innovation was the individual entrepreneurial characteristic with the highest statistical significance among the various dimensions examined in university students at the Institut d'Enseignement Supérieur du Ruhengerien (Nshimiyimana et al., 2018).

The multiple regression model showed an increase in the coefficients for attitude (from 0.942 to 0.987) and aptitude (from 0.637 to 0.718) at the end of the EE program, suggesting that entrepreneurial attitude contributed the most to entrepreneurial competencies necessary for value creation. This result contrasts with research conducted by Mets et al. (2017) in Estonia, which found that students with higher aspirations to become entrepreneurs before entering a HEI perceived their entrepreneurship knowledge, skills, and attitudes to be stronger. However, it aligns with other research conducted in three public universities in Indonesia, which found that EE effectively influences students' attitudes toward entrepreneurship (Kusumojanto et al., 2020).

CONCLUSIONS

This research study demonstrated that the EE program implemented by the 1551 Incubadora de Empresas Innovadoras [1551 Innovative Business Incubator] had a positive impact on the entrepreneurial competencies of UNMSM students necessary for value creation. This was confirmed by the multiple regression testing conducted, which established the goodness of fit (GoF) of the model to explain the entrepreneurial competencies, with a significance level (F) less than 0.05. The results also indicated that both entrepreneurial aptitude and attitude significantly influenced entrepreneurial competencies, with a *t* value also below 0.05. Notably, entrepreneurial aptitude is the strongest predictor of entrepreneurial competencies to create value.

Furthermore, the multiple regression model revealed that entrepreneurial attitude was the most significant contributor to the entrepreneurial competencies of UNMSM students, while entrepreneurial aptitude showed the greatest increase after the EE program.

It is noteworthy that according to Spearman's rho coefficient, the correlation between the variables ENT_EDU and ENT_COM shifted from "moderately positive" to "very strong positive" after UNMSM students participated in the EE program.

The research findings highlighted that the entrepreneurial aptitude of UNMSM students who participated in the EE program influenced their entrepreneurial competencies to create value, as evidenced by *t* values of less than 0.05. This positive relationship was further supported by an increase in the beta coefficient from 0.739 to 0.822 upon completion of the program, indicating that the program enhanced the explanation of entrepreneurial competencies.

Lastly, the study found that the entrepreneurial attitude of UNMSM students influenced their value-creating competencies upon completing the EE program. Statistical tests showed a significance level of *t* less than 0.05, indicating that a positive relationship existed and that a better explanation of entrepreneurial competencies was achieved upon completion of the EE program, as supported by an increase in the beta coefficient from 0.581 to 0.724.

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