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The Moderating Role of Entrepreneurial Self-Efficacy and Locus of Control on the Effect of the University Environment and Program on Entrepreneurial Intention and Attitudes

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Abstract: This article examines the influence of the university environment and learning programs on students' entrepreneurial intentions and attitudes, considering the moderating roles of entrepreneurial self-efficacy and locus of control. The empirical analysis employs a multilevel (hierarchical) linear model, utilizing responses from 713 students across 30 universities in Kazakhstan who participated in the GUESSS 2021 project survey. Our findings reveal that students' entrepreneurial intentions are directly influenced by entrepreneurial self-efficacy and locus of control. However, the locus of control is also indirectly influenced by the university environment and learning program. The learning program's effect on both entrepreneurial aspirations and attitudes is mediated by self-efficacy. Locus of control, conversely, negatively affects both entrepreneurial attitudes and intentions in program learning. The study's results underscore that student entrepreneurship is shaped by personal factors such as self-efficacy and locus of control, alongside the university context. Interestingly, the findings also indicate interdependencies between these factors, further influencing students' entrepreneurial intentions and attitudes.

Keywords: *Entrepreneurial intention and attitudes, entrepreneurial self-efficacy, locus of control, student entrepreneurship, university environment.*

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Introduction

According to Gubik (2021), in the year 1755, Richard Cantillon was the first person to use the term "entrepreneurship." In today's society, the concept of entrepreneurship is frequently addressed. There are many ways to describe entrepreneurship. Some people regard it as a process of successfully organizing a business, while others see it as the development of a certain attitude and set of abilities (Diandra & Azmy, 2020). After that, ideas like "entrepreneurship as the source of innovation and technological change" (Shumpeter, 1934) and "entrepreneurship as the recognition of opportunities" (Kirzner, 1973) came to light, and professionals learned about new things (Gancarczyk & Ujwary-Gil, 2021).

In recent decades, innovation and entrepreneurship have played a crucial role in contemporary economies, and the correlation between entrepreneurship and economic growth has become increasingly accepted in local (Carree & Thurik, 2010; European Commission, 2016; Meyer & Krüger, 2021), regional as well as in global context (Bigos & Wach, 2021). Given that the rate of economic growth in any nation is directly correlated to the number of young people who start their own businesses, the promotion of entrepreneurial activity among university students and faculty has become a significant concern (Rauch & Hulsink, 2015). Swiss experts in the field of small and medium-sized businesses starting from 2003 have been conducting a survey of students in different countries of the world "Global University Entrepreneurial Spirit Student' Survey" (GUESSS) to understand entrepreneurial ideas of young people (See https://www.guesssurvey.org/). Higher education can influence entrepreneurial ideas under the right conditions, which is why universities started to provide entrepreneurial intention and activity services throughout education (Eurofound, 2015; European Commission, 2013). Here, the importance of GUESSS research is crucial in understanding various trends

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among Kazakhstani students in entrepreneurial activity and their opinion on academic programs created for developing business skills.

An individual's entrepreneurial competence level is both an important feature and the most accurate indicator of the intention to engage in entrepreneurial activity and the level of success that follows (Santos & Liguori, 2020; Travis & Freeman, 2017). Previous research has made significant contributions to the body of knowledge surrounding entrepreneurship; yet, questions concerning the influence of self-efficacy on entrepreneurial intention have not been satisfactorily resolved (Doanh & Bernat, 2019). Moreover, there are contentious studies regarding the impact of locus of control (LOC) on entrepreneurial intentions (Nasip et al., 2017; Rajh et al., 2016).

The study stems from the necessity to understand the complex interplay between personal factors and contextual influences in shaping entrepreneurial intentions and attitudes among university students. The rapidly evolving global economic landscape demands a continuous supply of innovative and entrepreneurial individuals, making it crucial for academic institutions to foster entrepreneurial mindsets in their students. Consequently, it becomes essential to explore the factors contributing to the development of these entrepreneurial aspirations and behaviors.

This research specifically aims to investigate the moderating roles of entrepreneurial self-efficacy and locus of control in determining the relationship between the university environment and learning program on one hand and entrepreneurial intentions and attitudes on the other. Entrepreneurial self-efficacy refers to an individual's belief in their ability to successfully execute entrepreneurial tasks, while locus of control reflects the extent to which an individual believes they can control events affecting them. It seeks to shed light on the nuanced interactions between the university context, learning program, and personal factors such as self-efficacy and locus of control, thus providing valuable insights for universities and educators in designing effective curricula and interventions to foster entrepreneurship among students. Moreover, understanding the cross-dependencies between these factors can help identify potential areas of improvement in the educational system and inform evidence-based policy-making efforts to promote entrepreneurship as a viable career path for students. In summary, this study is grounded in the need to explore the multifaceted nature of factors influencing entrepreneurial intentions and attitudes and to facilitate the development of strategies to cultivate entrepreneurial talent within higher education institutions.

Literature Review

Entrepreneurship is a mindset that prioritizes opportunities over risks. According to N. F. Krueger et al. (2000), recognition opportunity is an intentional procedure. It is critical to have a good understanding of the factors that impact intentions to act. It is equally crucial to shed light on the underlying factors that are driving an entrepreneur's decisions and attitudes. Because our hypotheses involve testing the role of entrepreneurial self-efficacy and locus of control on the effect of the university environment and program learning on entrepreneurial intention and attitudes toward entrepreneurship, it is essential to understand the psychological background of each term as well as the interdependence of the various concepts.

University Environment and Entrepreneurial Activities

Students may have the chance to engage in entrepreneurial activities in a university setting. Zhang et al. (2014) claim that institutions can encourage student entrepreneurship in a variety of ways. Depending on the changing economic dynamics, increasing the employability opportunities of students after graduation becomes an important task for universities (Ivanova et al., 2022; Y. C. Zhang et al., 2022). So, they can teach students how to identify possibilities, create business ideas, and gather resources. Recent studies by Liu et al. (2022) expanded the findings of earlier research on the theory of planned behavior (TPB) by empirically addressing how the need for autonomy enhances the positive effects of university support on entrepreneurial self-efficacy, subjective norms, and entrepreneurial attitudes. A person's attitude toward a behavior, their sense of social pressure to do or refrain from performing a behavior, and their belief in their own efficacy in executing a behavior are further factors that the TPB claims regulate human behavior (Adebola, 2021; Ajzen & Cote, 2008).

In many studies (Gubik, 2021; Liu et al., 2022; Silva et al., 2021; Turker & Selcuk, 2009) investigating the relationship or effect between entrepreneurship and university environment and education, it is stated that there is a relationship between the concept directly or through intermediaries. The findings of the study (Liu et al., 2022) indicate that a positive and significant relationship exists between perceived university support for entrepreneurship and students' entrepreneurial intentions via subjective norms and entrepreneurial self-efficacy.

Rotter (1966) introduced the concept of *locus of control* (LOC), describing it as a person's belief in their ability to influence specific events through their personal traits, distinguishing between internal and external types of LOC. This notion of control is crucial as the degree to which individuals perceive themselves to be in control can significantly impact their attitudes and resilience when faced with challenging situations (Fabella & Aler, 2023). Interestingly, individuals who view themselves as being in a position of control are more inclined to engage in entrepreneurial activities (Rotter, 1966). This can be attributed to their belief in their ability to affect outcomes or possessing the necessary attributes to justify the results. Research by Ekawarna et al. (2020) and Islam (2019) has shown that students in a supportive academic

environment are more likely to develop their locus of control, which in turn influences their entrepreneurial intentions. Consequently, fostering a nurturing educational context plays a critical role in shaping students' perceptions of control, thus impacting their propensity towards entrepreneurship.

Entrepreneurship Education

Although a number of studies (Bergmann et al., 2018; Fayolle et al., 2006; Fernández-Pérez et al., 2019; Mahdaly & Usman, 2020; Shah et al., 2020) have examined the influence of entrepreneurship education on the individual building of human capital and entrepreneurial goals, findings indicate that student involvement in *entrepreneurship courses* also has broader *social implications*. Even if they have not taken an entrepreneurship course, those who connect with fellow students who have participated in such courses have a more favorable image of entrepreneurship training at their university (Bergmann et al., 2018). Moreover, entrepreneurship education equips students with a theoretical understanding of the notion of entrepreneurship as well as the *attitudes* (Ajzen & Fishbein, 1977), behaviors, and mindset of an entrepreneur, hence favorably influencing *entrepreneurial self-efficacy* (Boyd & Vozikis, 1994). Wardana et al. (2020) derive supporting conclusions suggesting that settings in which the entrepreneurship education model is reinforced and supported by a planned curriculum will result in *entrepreneurial self-efficacy.* There are two basic categories of entrepreneurship courses: compulsory courses that are a fundamental component of the curriculum for specific degree programs and elective courses in which participation is optional (N. F. Krueger et al., 2000). It is up to the student to decide which classes to enroll in. Different criteria for gauging entrepreneurial self-efficacy (ESE) must be taken into account if a program's goal is to improve start-up rates as rapidly as possible. However, tracking changes in ESE, especially the start-up dimension, will demonstrate whether the education or training being measured is having the desired impact on people. Closer monitoring of actual action performed outside of the program is important (Barakat et al., 2014).

Entrepreneurial Self-Efficacy

The intentional process involves the entrepreneur's personal requirements, values, desires, behaviors, and beliefs, each having its own precedents (Bird, 1988). Ajzen's theory of planned behavior implies that perceived behavioral control is an essential driver of both intentions and behavior. This component represents the perceived difficulty or ease of doing a task, considering both the individual's prior experience and predicted future hurdles (Ajzen, 1985). Perceived behavioral control and Bandura's concept of self-efficacy coincide substantially (Bandura, 1977a). Self-efficacy increases both outcome expectations and aspiration levels for goal actions, which strengthens one's intents (N. Krueger, 1993). Following Ajzen's (1985) theory of planned behavior, attitudes toward entrepreneurship and perceived self-efficacy views regarding the chances of success or failure will impact the development of entrepreneurial intentions (Boyd & Vozikis, 1994).

The inclinations that respond to a psychological object with a degree of favorability or unfavourability are referred to as attitudes. Because the traits that become associated with the thing are already favourably or negatively valued, we instantly and concurrently form an opinion about the object (Ajzen & Cote, 2008).

According to Hassan et al. (2020), entrepreneurial self-efficacy is one of the crucial cognitive precursors of entrepreneurial intent. Individuals with high levels of entrepreneurial self-efficacy are more likely to successfully undertake the entrepreneurship process and face the challenging conditions associated with starting a new business. Therefore, it has been hypothesized that entrepreneurial self-efficacy influences entrepreneurial intention directly (Hassan et al., 2020). Zhao et al. (2005) offered evidence that individuals choose to become entrepreneurs (or at least formulate the intent to do so) because they have a strong level of entrepreneurial self-efficacy, or the idea that they can be effective in this role.

A person's belief can influence his or her intention and action, and a person's attitude toward a particular behavior can be affected by his or her belief in the behavior's consequences. A person with strong confidence in his or her capacity to accomplish a certain activity can have a strong desire to reach this goal. Thus, entrepreneurial self-efficacy can impact an individual's attitude toward entrepreneurship (Boyd & Vozikis, 1994).

Locus of Control and Entrepreneurial Intention

If a man is to live in peace with himself, he must become more effective and more able to view himself as the determinant of his fate (Lefcourt, 1976). Rotter (1966) established the concept of locus of control (LOC), distinguishing between two types: internal and external control. Individuals with an internal locus of control believe they have the power to shape their own destinies, resulting in increased confidence, alertness, and a sense of direction as they attempt to exert control over their environments (Asante & Affum-Osei, 2019). Moreover, they often perceive a strong connection between their actions and the outcomes they experience. Conversely, those with an external locus of control feel that they lack direct influence over their fate, considering themselves passive in relation to their surroundings (Kesavayuth et al., 2020). As a result, they are more likely to attribute personal outcomes to external factors or chance (Rotter, 1966).

There are controversial studies that either support or reject the positive effect of the LOC on entrepreneurial intentions. Nasip et al. (2017) found that the locus of control had no significant effect on entrepreneurial ambition among Malaysian

undergraduate students. By explaining that this insignificant finding may be the result of undergraduates in Sabah being influenced by the national cultural position of more collective ideas compared to the high individual countries such as the United States, the United Kingdom, and Australia, it is possible that this finding is insignificant. Malaysians can be considered easterners who tend to regard themselves as group members. In addition, Rajh et al. (2016) examined the same hypotheses in four Southeast European countries: Bosnia and Herzegovina, Croatia, Macedonia, and Serbia. The locus of control was hypothesized to positively enhance entrepreneurial intention. In addition, the sample comprised of 1,200 economics and business university students, with 300 respondents from each country included in the study. Similarly, the hypothesis has been rejected.

Correlation analysis of the Ukrainian sample of business students' entrepreneurial intentions research in the Ukrainian context revealed a high positive correlation between locus of control and self-efficacy, entrepreneurial intentions, and attitude toward entrepreneurship (Dimitrov et al., 2020). The findings by Karimi et al. (2016) in the Iranian setting demonstrates that external personality traits are highly related to EI via its motivational antecedents. Existing theories and the idea that distal personality features are essential for predicting entrepreneurial achievements, but only through more proximal motivational and cognitive components, are thus supported. Therefore, we can conclude that LOC positively affects entrepreneurial intentions and attitude.

The Moderating Role of Entrepreneurial Self-Efficacy

ESE is derived from the broader idea of self-efficacy based on social cognitive theory (Bandura, 1977b), which emphasizes the relevance of social context, observation, and replication of behavior in social learning for the formation of self-efficacy beliefs. There are tons of studies (Doanh, 2021; Hmieleski & Corbett, 2008; Yang, 2016) analyzing the correlations between entrepreneurial self-efficacy and EI and EA. However, not many researches have been done in examining moderation role of the entrepreneurial self-efficacy on university environment, program learning and entrepreneurial intention and attitudes, and relationship between them as entrepreneurial self-efficacy as a moderating.

The study by Doanh in Vietnamese context demonstrates that entrepreneurial self-efficacy not only influences entrepreneurial intention but also moderates the relationship between entrepreneurial attitude and entrepreneurial intention (Doanh, 2021). Researchers and educators can better understand the relationship between assignments and pedagogy, on the one hand, and students' ideas of themselves, on the other, because self-efficacy is a predictor of choice and performance. The research by Mozahem and Adlouni (2021) showed that students who had taken the course had higher levels of self-efficacy than those who had not, at least in the four universities from which the sample was collected. Thus, demonstrating the moderating effect of entrepreneurial self-efficacy on the university environment and future entrepreneurial attitudes and intents of students. Students' conscious belief and trust in their abilities to obtain, undertake efforts, and display perseverance in the face of adversity are fostered through entrepreneurship education (Passaro et al., 2018).

According to research conducted by Uddin et al. (2022), self-efficacy moderates the relationship between entrepreneurial education and business students' zeal for creating entrepreneurial ambitions. According to do Dinis et al. (2013), individuals will increase their entrepreneurial potential once they recognize that they actually possess the capability, that there are environmental opportunities, and that there is social support. If the appropriate entrepreneurial environment is created, it will have an impact on both EAs and EIs.

From the perspective of the TPB (Ajzen & Fishbein, 2000), the impact of entrepreneurship education programs is to alter individual attitudes and consequently intentions regarding entrepreneurship (Fayolle et al., 2006). If the student's environment is equipped with good learning entrepreneurship practical programs, it enhances the chances of him/her becoming an entrepreneur. However, only the environment is not enough. Furthermore, here comes the psychological/behavioral part i.e., self-efficacy of the student to continue studying and not give up while entrepreneurial challenges are faced. Using structural equation modelling, Zhao et al. (2005) examined the mediating effect of self-efficacy on the entrepreneurial intention of postgraduate students from five universities. Their findings indicated that self-efficacy strongly mediated the association between entrepreneurship learning courses, entrepreneurial experience, risk-taking tendency, and the development of an entrepreneurial ambition to launch new businesses among Chicago university students.

The Moderating Role of LOC

In their work entitled "Integrating psychological approaches to entrepreneurship: the Entrepreneurial Personality System (EPS)" Obschonka and Stuetzer (2017) argue that entrepreneurship programs, such as university courses, often aim to enhance entrepreneurial characteristic adaptations, including motivational constructs like entrepreneurial attitudes and self-efficacy beliefs, as well as entrepreneurial skills and cognitions. According to the EPS framework, these programs should consider that learning and adaptation processes involving these characteristic adaptations (and occasionally the self-concept level) are influenced or even guided by the basic tendency level, representing the stable core of the personality system.

Self-efficacy is a fundamental aspect of locus of control (LOC) (Kormanik & Rocco, 2009; Rotter, 1966). In this context, self-efficacy and entrepreneurial attitudes are positively affected by program learning. This suggests that entrepreneurship programs and training should focus on enhancing such personality traits, and their effects should be guided by the stable core of the personality system. Consequently, locus of control serves as a mediator between program learning and entrepreneurial attitudes.

Another question arises concerning the environment and intention upon which LOC exerts influence. While some studies suggest a mediating role of LOC on university support and entrepreneurial intentions, such as Islam's (2019) study, which demonstrated that LOC partially mediated the relationship between university support and entrepreneurial inclinations, it can be argued that LOC might have a moderating role on the variables (university environment and entrepreneurial intentions). Studies (Albert & Dahling, 2016; Fabella & Aler, 2023; Wright & DuCette, 1976) support the idea that locus of control can predict achievement in educational contexts. Their initial analysis indicated that internality was positively associated with achievement in open environments but not in traditional ones. The findings of the subsequent analysis corroborate the same overall conclusion. Although LOC is a crucial predictor in shaping entrepreneurial attitudes and intentions, there is no evidence to suggest that it has a moderating role in the relationship between university environment, entrepreneurial attitudes, and entrepreneurial intentions.

The framework of the research is demonstrated in Figure1. In the framework, the University environment, program learning, entrepreneurial self-efficacy, and locus of control variables are independent variables. Entrepreneurial intention and entrepreneurial attitudes are dependent variables. Also, entrepreneurial self-efficacy and locus of control are moderator variables.

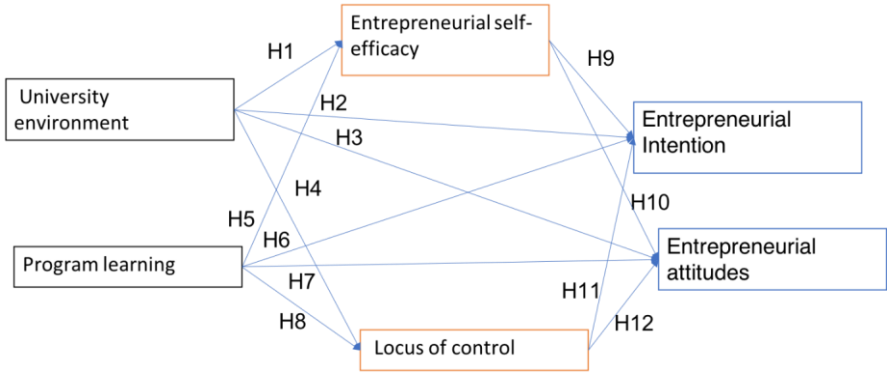

Figure 1. Framework of the Research

Based on the review of the literature and the framework of the research, our hypotheses are as follows:

H1: University environment has a positive effect on entrepreneurial self-efficacy.

H2: University environment has a positive effect on entrepreneurial intention.

H3: University environment has a positive effect on entrepreneurial attitudes.

H4: University environment has a positive effect on the locus of control.

H5: Program learning has a positive effect on entrepreneurial self-efficacy.

H6: Program learning has a positive effect on entrepreneurial intention.

H7: Program learning has a positive effect on entrepreneurial attitudes.

H8: Program learning has a positive effect on the locus of control.

H9: Entrepreneurial self-efficacy has a positive effect on entrepreneurial intention.

H10: Entrepreneurial self-efficacy has a positive effect on Entrepreneurial attitudes.

H11: Locus of control has a positive effect on entrepreneurial intention.

H12: Locus of control has a positive effect on Entrepreneurial attitudes.

H13: Entrepreneurial self-efficacy has a moderating role on the university environment and entrepreneurial intention.

H14: Entrepreneurial self-efficacy has a moderating role on the university environment and entrepreneurial attitudes.

H15: Locus of control has a moderating role on the university environment and entrepreneurial intention.

H16: Locus of control has a moderating role on the university environment and entrepreneurial attitudes.

H17: Entrepreneurial self-efficacy has a moderating role on the program learning and entrepreneurial intention.

H18: Entrepreneurial self-efficacy has a moderating role on the program learning and entrepreneurial attitudes.

H19: Locus of control has a moderating role on the program learning and entrepreneurial intention.

H20: Locus of control has a moderating role on the program learning and entrepreneurial attitudes.

Methodology

Research Design

The research was conducted using a quantitative methodology. Using the acquired data, structural equation modeling was performed to validate the theoretically developed model. When the estimating approach has determined a viable solution, the model's fit must be assessed (Schermelleh-Engel et al., 2003).

Sample

After data cleaning, 713 participants remained in the sample. While 633 (88.8%) of them are undergraduate students, 78 (11%) are studying at the master's level or higher. While 499 (70%) of the participants stated their gender as female, 207 (29%) stated as male and 7 people stated as other.

Data Collection Tool

University Environment Questionnaire

It was utilized as a measure to determine whether the environment of the participants' colleges, where they continue their study, fosters entrepreneurial endeavors. The items for the questionnaire came from Franke and Lüthje's (2004) work. The scale consists of three different questions, each with seven possible responses ranging from "not at all" to "very much. Investigations of the reliability and accuracy of this sample were done. It was decided to carry out a scale confirmatory factor analysis. The confirmatory factor analysis results show that the scale is structurally useful (CFI = 1, TLI = 1.00, SRMR = .01, RMSEA = .01, Cronbach's alpha = .886, composite reliability = .891).

Program Learning Questionnaire

It was utilized as a tool for determining whether the academic programs at the colleges and universities where the participants completed their studies promoted entrepreneurial endeavors. Items for the questionnaire were taken directly from the research conducted by Souitaris et al. (2007). The scale is comprised of five distinct questions, each of which can be answered with one of seven potential replies ranging from "not at all" to "very much.". An investigation on the validity and reliability of this sample was carried out. The scale is structurally useable, as shown by the findings of the confirmatory factor analysis (CFI = 1, TLI = 1, SRMR = .00211, RMSEA < .001, Cronbach's alpha = .937, and composite reliability = .938).

Entrepreneurial Self-Efficacy Questionnaire

The entrepreneurial self-efficacy scale was used to assess the entrepreneurial self-efficacy of the participants. Recent survey items are included. Zhao et al. (2005). They determined the level of confidence to be .78. Each of the seven items on the scale has seven possible responses, ranging from " very low competence" to " very high competence." For this sample, a validity and reliability analysis were done. The scale is structurally useable, as determined by confirmatory factor analysis (CFI = .997, TLI = .992, SRMR = .00814, RMSEA = .0513, Cronbach's alpha = .954, composite reliability = .954).

Locus of Control Questionnaire

The items in Levenson's (1973) research were used to measure the amount of internal control among the participants. For this sample, a validity and reliability analysis were done. There are seven alternative replies for each of the three items on the scale, ranging from "strongly disagree" to "strongly agree" The scale is structurally useable, as determined by confirmatory factor analysis (CFI = 1, TLI = 1, SRMR = .001, RMSEA = .001, Cronbach's alpha = .847, composite reliability = .859).

Entrepreneurial Intention and Attitudes Questionnaire

The measure was based on the participants' objectives and attitudes about entrepreneurship. The scale items were obtained from the study (Liñán & Chen, 2009). For this sample, a validity and reliability analysis were done. Each of the eleven items on the scale has seven potential responses, ranging from "strongly disagree" to "strongly agree". The scale is structurally useful based on the findings of confirmatory factor analysis (CFI = .986, TLI = .977, SRMR = .0218, RMSEA = .961, Cronbach's alpha = .961, and composite reliability = .961).

Data Analysis

Data cleaning was carried out by paying attention to the fact that at least one item was answered in the intention and attitudes scale sections. In the second stage, it was determined whether there were outliers or not. The data determined as outliers in the box plots were excluded from the sample. Then, it was examined whether the data had a normal distribution. According to Kim (2013), skewness is between -2 and +2 and kurtosis should not be bigger than 7 in large samples (n>300), indicating that the measurement has a normal distribution. When the measurements were examined, it was determined that the skewness values were between .8367 and .0681, and the Kurtosis values were between -1.1760 and .0756. According to this result, it can be said that the measurements have a normal distribution. Since more than one scale was applied in the study, it was checked whether there was a common method bias (Podsakoff et al., 2003) . For this reason, all scale items were subjected to Exploratory Factor analysis as if they were a single scale. According to the result of EFA, it proposed a 5-dimensional structure. And the first dimension explains 23.19%. The fact that it is very structured compared to the single scale and the first dimension is below 50% indicates that there is no common method bias.

Structural equation models were used to test the model's accuracy and hypotheses. Jamovi (Jamovi Project, 2023) software was used for analysis. Model fit indexes (χ2 /df, CFI, TLI, NFI, IFI, SRMR and RMSE) were checked first. χ2 /df should be smaller than .50. CFI, TLI, NFI and IFI should be bigger than .90. SRMR should be smaller than 0.1 and RMSE should be smaller than .08 (Hu & Bentler, 1999; Kim et al., 2015). Since it was not at a sufficient level, the covariance stipulated by the software was retested by making changes. The model was accepted when it reached the critical level. Then, it was checked whether the hypotheses were supported or not.

Findings

Before testing the model, correlation values between variables were examined. There should be a relationship between the variables, but this relationship level should not be higher than .90 (Kline, 2005). When Table 1 is examined, the correlation values among the variables are significant and vary between .151 and .803.

Table 1. Correlation Among the Variables

Descriptive	Mean	SD	1	2	3	4	5
1-Intention	4.20	1.77					
2-Attitutes	4.56	1.69	.803***				
3-Self-efficacy	4.45	1.62	.705***	.694***			
4-Locus of control	4.39	6.84	.185***	.151***	.220***		
5-Environment	4.06	1.78	.362***	.310***	.410***	.409***	
6-Programs	3.97	1.69	.385***	.361***	.445***	.295***	.729***

*** $p < .001$

Structural equation analysis was performed to test the model. Because the model goodness indices were not sufficient in the first analysis result especially $x^2/df > 5$, SRMR > .10 RMSEA > .80. According to the model modification suggestions, a covariance connection was added between the items in the system. In the final model, the indices values are among the acceptable values (Kim et al., 2015). Since the model was at an acceptable level according to the data in Table 2, the results of the hypotheses were checked.

Table 2. Model Fit Indexes

Model	X^2/df	TLI	CFI	NFI	IFI	SRMR	RMSEA	RMSEA 95% CI Lower	RMSEA 95% CI Upper
Critical	<5	> .9	> .9	> .9	> .9	< .1	< .08		
Initial Model	2192/364=6.03	.903	.903	.886	.903	.121	.088	.084	.092
Final Model	1114/342=3.26	.959	.959	.942	.959	.098	.059	.057	.063

To test hypotheses, each path must be statistically significant. **β**, *z* and significance values were checked according to Table 3. Accordingly, the acceptance and rejection of the hypotheses are expressed in the methodology. Of the 20 generated hypotheses, 13 were validated (Table 5).

Path Results

Table 3. Path Analyses Results

					95% Confidence Intervals				
H	**From**	**To**	**Estimate**	**SE**	**Lower**	**Upper**	**β**	**z**	**p**
H1	environment	Self-efficacy	.102	.056	-.008	.212	.1163	1.8198	.069
H2	environment	intention	.050	.044	-.037	.137	.0609	1.1315	.258
H3	environment	attitudes	.025	.037	-.048	.097	.0353	.6720	.502
H4	environment	Locus of control	.129	.053	.025	.232	.1694	2.4345	.015*
H5	programs	Self-efficacy	.421	.068	.288	.554	.4047	6.2128	< .001*
H6	programs	intention	.001	.055	-.107	.109	.0001	.0150	.988
H7	programs	attitudes	-.011	.046	-.101	.080	-.0128	-.2317	.817
H8	programs	Locus of control	.257	.063	.133	.380	.2852	4.0661	< .001*
H9	Self-efficacy	intention	.641	.039	.564	.718	.6848	16.3470	< .001*
H10	Self-efficacy	attitudes	.528	.035	.459	.597	.6589	14.9560	< .001*
H11	Locus of control	intention	.084	.038	.011	.158	.0777	2.2474	.025*
H12	Locus of control	attitudes	.074	.031	.012	.135	.0793	2.3413	.019*

* Significant at .05 level

To test hypotheses, each path must be statistically significant. **β**, *z* and significance values (*p*) were checked according to Table 3. According to result, H1, H2, H3, H6 and H7 are rejected. H4, H5, H8, H9, H10, H11 and H12 are accepted. The variable that has the most effect on intention is self-efficacy (β =0.658). Environment and program variables seem to have no direct effect. In the Attitudes variable, the self-efficacy variable has a greater effect. In attitudes variable, the direct effect of the environment and program variables is not statistically significant level ($p > .05$).

Moderating effect

Table 4. Moderating Analyses Results

				95% Confidence Intervals				
H	**Description**	**Estimate**	**SE**	**Lower**	**Upper**	**β**	**z**	**p**
H13	environment ⇒ self_efficacy ⇒ intention	.066	.036	-.005	.136	.080	1.812	.070
H14	environment ⇒ self_efficacy ⇒ attitutes	.054	.030	-.004	.112	.077	1.810	.070
H15	environment ⇒ Locus_of_control ⇒ intention	.011	.007	-.002	.024	.013	1.664	.096
H16	environment ⇒ Locus_of_control ⇒ attitutes	.009	.006	-.001	.020	.013	1.699	.089
H17	programs ⇒ self_efficacy ⇒ intention	.270	.046	.180	.360	.277	5.867	< .001*
H18	programs ⇒ self_efficacy ⇒ attitutes	.222	.038	.147	.298	.267	5.796	< .001*
H19	programs ⇒ Locus_of_control ⇒ intention	.022	.011	.000	.043	.022	1.971	.049*
H20	programs ⇒ Locus_of_control ⇒ attitutes	.019	.009	.001	.037	.023	2.035	.042*

* Significant at .05 level

Additionally, it was looked at whether the locus of control and self-efficacy variables had a moderating impact on the model. As a result of the analysis, H13 and H14 hypotheses were not supported. In other words, it was observed that self-efficacy did not have a mediating role in the effects of the environment on entrepreneurial intention and entrepreneurial attitudes. However, it has been observed that self-efficacy has a mediating role in the effect of the program on both entrepreneurial intention and entrepreneurial attitudes (H17 and H18). Since the direct effect of the program on both entrepreneurial intention and entrepreneurial attitudes is not statistically significant, it can be said that self-efficacy has a full moderating effect on the said relationship. When the moderating effect of the locus of control variable is examined, the locus of control variable has not a moderating effect on both intention and attitudes. So H15 and H16 also are rejected. The locus of control, however, has a moderating impact on both entrepreneurial orientation and intention in program variables. So H19 and H20 are supported. Since the direct effect of the program on both intention and attitude is not statistically significant, it can be said that the locus of control variable has a full moderating effect.

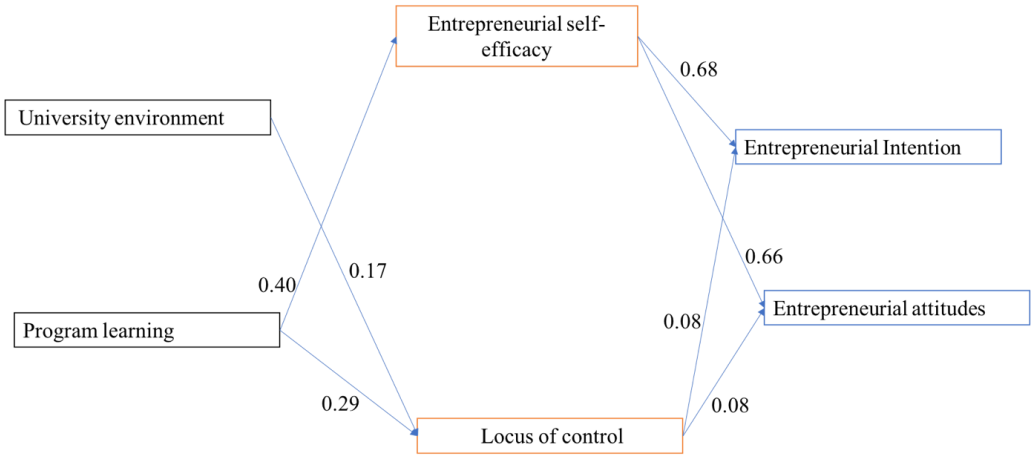

Figure 2. Final Model

The new model formed upon deletion of unsupported hypotheses is presented in Figure 2. When the ratio of the independent variables affecting the dependent variables (R^2) is analyzed, it was calculated as R^2 = .542 for the entrepreneurial Intention variable. While the locus of control and entrepreneurial self-efficacy have a direct impact on entrepreneurial intention, university environment and program learning variables have an indirect effect on the locus of control variable. Similarly, R^2= .477 was calculated for the entrepreneurial attitude's variable. While entrepreneurial self-efficacy and locus of control variables have a direct effect on this variable, university environment and program learning variables have an indirect effect on the locus of control variable. When beta values are examined, the Entrepreneurial self-efficacy variable has the most effect on both Entrepreneurial Intention and Entrepreneurial attitudes variable.

Table 5. Results of the Research Hypotheses

Hypotheses	**Results**
H1: University environment has a positive effect on entrepreneurial self-efficacy	Reject
H2: University environment has a positive effect on entrepreneurial intention	Reject
H3: university environment has a positive effect on entrepreneurial attitudes	Reject
H4: university environment has a positive effect on the locus of control	Accepted
H5: Program learning has a positive effect on entrepreneurial self-efficacy	Accepted
H6: Program learning has a positive effect on entrepreneurial intention	Rejected
H7: Program learning has a positive effect on entrepreneurial attitudes	Rejected
H8: Program learning has a positive effect on the locus of control	Accepted
H9: Entrepreneurial self-efficacy has a positive effect on entrepreneurial intention	Accepted
H10: Entrepreneurial self-efficacy has a positive effect on Entrepreneurial attitudes	Accepted
H11: Locus of control has a positive effect on entrepreneurial intention	Accepted
H12: Locus of control has a positive effect on Entrepreneurial attitudes	Accepted
H13: Entrepreneurial self-efficacy has a moderating role on the university environment and entrepreneurial intention	Reject
H14: Entrepreneurial self-efficacy has a moderating role on the university environment and entrepreneurial attitudes	Reject
H15: Locus of control has a moderating role on the university environment and entrepreneurial intention	Reject
H16: Locus of control has a moderating role on the university environment and entrepreneurial attitudes	Reject
H17: Entrepreneurial self-efficacy has a moderating role on the program learning and entrepreneurial intention	Accept
H18: Entrepreneurial self-efficacy has a moderating role on the program learning and entrepreneurial attitudes	Accept
H19: Locus of control has a moderating role on the program learning and entrepreneurial intention	Accept
H20: Locus of control has a moderating role on the program learning and entrepreneurial attitudes	Accept

Discussion

The main goal of this study was to examine the moderating role of entrepreneurial self-efficacy (ESE) and locus of control (LOC) on the entrepreneurial intentions and attitudes of students in the context of the university environment and learning program. This study analyzed how cognitive personality variables affect students' entrepreneurial characteristics in Kazakhstani universities. The empirical study used a sample of 713 students from 30 universities in Kazakhstan. At the same time, 36% of respondents - were from technical universities, 27% - were from pedagogical universities, interdisciplinary and economic universities - 25%, and medical universities - 12%.

The final model's goodness indices are within acceptable values. Out of the 20 generated hypotheses, 13 were validated. Firstly, it was found that the university environment has a positive effect on the locus of control (H4), indicating that the context in which students learn can influence their perception of control over their lives. It is a fact that the university environment affects many behaviors such as creativity, curiosity, critical thinking, political awareness, engagement, and motivation to learn (Badaru & Adu, 2021; Barakat et al., 2014; Dube et al., 2023; Galán-Casado et al., 2020; Molomo, 2023; Nur'Aini, 2021; Wahyudi, 2021). According to Islam (2019), the university environment has a positive effect on the locus of control. Existing research demonstrates that a well-designed university curriculum can contribute to the development of ESE (Wardana et al., 2020). Regarding the impact of the university environment on ESE and LOC, the present study discovered that the university environment positively influences locus of control but does not have a significant effect on ESE.

Additionally, program learning positively impacts entrepreneurial self-efficacy (H5), suggesting that educational programs can help enhance students' belief in their abilities to perform entrepreneurial tasks. Also, the study showed that program learning has a positive effect on the locus of control (H8), implying that participating in these programs can also improve students' sense of control over their entrepreneurial endeavors. Learning programs and training-related entrepreneurship have a positive effect on students' entrepreneurial self-efficacy and locus of control (Atmono et al., 2023; Islam, 2019; Maritz & Brown, 2013).

Furthermore, both entrepreneurial self-efficacy (H9) and locus of control (H11) were found to positively affect entrepreneurial intention, indicating that students with higher self-efficacy and a stronger sense of control are more likely to pursue entrepreneurship. Similarly, both entrepreneurial self-efficacy (H10) and locus of control (H12) positively influence entrepreneurial attitudes, demonstrating that these factors can shape students' mindsets toward entrepreneurship. As the literature analysis showed, not many studies (Dimitrov et al., 2020; Nasip et al., 2017; Rajh et al., 2016) examine the role of ESE and LOC moderation in the university environment, as well as identifying relations with entrepreneurial intentions and attitudes of students. The study is based on a multilevel student entrepreneurship model that includes cognitive variables and the university context. Previous research has shown that entrepreneurial learning and cognitive variables contribute to students' entrepreneurial intentions (Bergmann et al., 2018). There are conflicting research results regarding the impact of LOC on students' entrepreneurial intentions. For example, in studies of Malaysian undergraduate students (Nasip et al., 2017) and in 4 countries in South-Eastern Europe (Rajh et al., 2016), this hypothesis was rejected. A study of the Kazakh sample of the study, as well as the Ukrainian sample (Dimitrov et al., 2020) shows a positive impact of LOC on the entrepreneurial characteristics of students (H11, H12). Thus, to predict the entrepreneurial activity of students, it is necessary to consider the cognitive variables of personality.

The analysis also revealed the moderating roles of entrepreneurial self-efficacy and locus of control. Entrepreneurial self-efficacy was found to have a moderating effect on the relationship between program learning and entrepreneurial intention (H17), as well as on the relationship between program learning and entrepreneurial attitudes (H18). This suggests that the impact of program learning on students' entrepreneurial intentions and attitudes can vary depending on their level of self-efficacy. Lastly, the locus of control was found to have a moderating effect on the relationship between program learning and entrepreneurial intention (H19) and the relationship between program learning and entrepreneurial attitudes (H20). This indicates that the influence of program learning on students' entrepreneurial intentions and attitudes can also be affected by their sense of control over their lives. Other studies (Jiatong et al., 2021; Qiao & Hua, 2019) also indicated that entrepreneurial self-efficacy serves as a positive mediator between entrepreneurial education and the development of an entrepreneurial mindset and creativity, ultimately leading to increased entrepreneurial intention. According to the Entrepreneurial Personality Concept (EPS) of Obschonka and Stuetzer (2017), entrepreneurship education should contain motivational cognitive components to improve students' entrepreneurial skills and knowledge. Research suggests that establishing an effective entrepreneurial environment fosters the growth of entrepreneurial potential and aspirations (Dinis et al., 2013; Seitbatkalova et al., 2023; Uddin et al., 2022). Additionally, Islam (2019) found that the locus of control (LOC) can influence the university environment and entrepreneurial intentions. This may be attributed to universities focusing primarily on traditional education and research missions. The rise of innovative entrepreneurial universities is now an emerging trend in higher education systems, including that of Kazakhstan.

Following the results of the survey analysis and accepted the hypothesis that the new model is offered. Analysis of the ratio of independent variables affecting dependent variables (R^2) showed that for the entrepreneurial intention variable $R^2 = .542$, for the entrepreneurial attitude variable $R^2 = .477$. ESE and LOC variables have a direct effect on entrepreneurial

intention, while university environment and curriculum variables indirectly influence the LOC variable. While ESE and LOC variables have a direct effect on entrepreneurial attitude, the university environment and study program variables have an indirect effect on the LOC variable. When examining beta values, the ESE variable has the most considerable impact on both the Intention and Attitude variables.

Economic growth relies on fostering entrepreneurship among young students (Rauch & Hulsink, 2015; Santos & Liguori, 2020; Travis & Freeman, 2017). In the Republic of Kazakhstan, the promotion of entrepreneurship and its integration into university curricula are crucial issues. Various programs and projects, both long and short-term, are dedicated to enhancing entrepreneurial activities and studies. However, there is a need to develop policies that facilitate joint program and project implementation across Kazakhstani universities (Kuzembayeva et al., 2022).

The course "Fundamentals of Entrepreneurship" is offered at universities to support the state program aimed at developing productive employment and mass entrepreneurship. Despite this, the GUESSS Kazakhstan-2021 survey reveals that approximately 41.5% of respondents have not participated in entrepreneurship courses (See https://www.guesssurvey.org/). These finding highlights that the implementation of entrepreneurial curricula is still an ongoing process at most Kazakhstani universities.

Conclusion

This study has provided valuable insights into the factors that influence entrepreneurship among university students in Kazakhstan. The findings indicate that entrepreneurial self-efficacy, locus of control, university environment, and program learning all play significant roles in shaping students' entrepreneurial intentions and attitudes. The research has demonstrated that entrepreneurial self-efficacy is the most influential factor affecting both entrepreneurial intention and attitudes, emphasizing the importance of cultivating self-efficacy in aspiring entrepreneurs. Furthermore, the locus of control was found to have a positive impact on both entrepreneurial intention and attitudes, highlighting the role of individual beliefs in driving entrepreneurial pursuits. Interestingly, while the university environment had a positive effect on the locus of control, it did not directly impact entrepreneurial self-efficacy. This finding suggests that universities should focus on fostering a supportive environment that encourages students to take control of their entrepreneurial journey. Additionally, program learning was shown to have a positive effect on entrepreneurial self-efficacy and locus of control, indicating the value of well-designed curricula in nurturing entrepreneurial mindsets. The study also revealed that entrepreneurial self-efficacy and locus of control have moderating roles in the relationship between program learning and entrepreneurial intention and attitudes. This finding underscores the importance of promoting self-efficacy and a sense of control among students to fully realize the benefits of entrepreneurship education.

Given the ongoing implementation of entrepreneurial curricula in Kazakhstani universities, these findings provide essential guidance for policymakers and educators seeking to optimize their efforts in nurturing the next generation of entrepreneurs. By fostering a supportive university environment, designing effective entrepreneurship programs, and focusing on individual factors such as self-efficacy and locus of control, universities in Kazakhstan can play a crucial role in promoting economic growth through entrepreneurship.

The study results confirm that student entrepreneurship, along with the university context, is determined by personal factors such as self-efficacy and locus of control. This study contributes to the development of the entrepreneurship education curriculum at universities. Among the limitations of the present study, which may represent implications and directions for future research, are the following. First, the data did not allow for the study of cross-dependencies between the factors themselves, which will be considered in further studies. In addition, it is possible to carry out additional research on the moderating role of LOC and ESE of the influence of the social environment (family, society, friends) on the entrepreneurial ambitions of Kazakhstani students.

Recommendations

Based on the findings of this study, the following recommendations are suggested for future research and the development of entrepreneurship curricula in universities:

1- Further studies: The current research did not allow for the examination of cross-dependencies between factors, which should be considered in future studies. This will provide a deeper understanding of the complex interplay between various factors influencing entrepreneurial ambitions among students.

2- Additional research on moderating factors: Future research could investigate the moderating role of locus of control (LOC) and entrepreneurial self-efficacy (ESE) on the influence of social environments (family, society, friends) on Kazakhstani students' entrepreneurial ambitions. This will help to better understand how different aspects of students' lives can impact their entrepreneurial intentions and attitudes.

3- Developing comprehensive entrepreneurship curricula: University entrepreneurship training programs should consider students' economic, social, and cognitive variables. Including the study of personal competencies and their impact on entrepreneurial success in the curricula would help students to better understand the skills and qualities needed for a successful entrepreneurial career.

4- Encouraging practical experience: To overcome barriers to entrepreneurial career development, universities should provide students with opportunities to gain practical experience through university business incubators and startup acceleration platforms. Allowing students to earn credit for testing their ideas in real-world settings would help them develop vital skills and knowledge for successful entrepreneurship.

5- Longitudinal studies: The GUESS project survey, which involved university students, young researchers, and teachers from various regions of Kazakhstan, offers a valuable longitudinal perspective on the development of entrepreneurial ambitions among students. By continuing such surveys and analyzing the data, researchers can draw more detailed conclusions about the relationships between factors influencing students' entrepreneurial activity.

Limitations

The data used in the study comes from a large-scale project. As a result, the questionnaire items could have some sort of interaction. Care should be used in extrapolating the results to all students in Kazakhstan due to the voluntary nature of the survey data.

Ethics Statements

Participating universities gave their consent during the data gathering procedure. Participation among the students was entirely optional. Students are informed that they may exit the data gathering process at any moment.

Authorship Contribution Statement

Sekerbayeva: Interpretation, drafting manuscript, critical revision of manuscript writing. Tamenova: Securing funding, admin, conceptualization. Tarman: Editing/reviewing, supervision, final approval. Demir: Design, statistical analysis. Baizyldayeva: Interpretation, discussion. Yussupova: Technical or material support.

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