Current Journal Of Humanities, Arts And Social Sciences (CJHASS)
Volume.05, Number 2; March-April 2018;
ISSN: 2836-8002| Impact Factor: 2.76
https://zapjournals.com/Journals/index.php/cjhass/index
Published By: Zendo Academic Publishing

RESILIENCE AND INNOVATION: ADAPTING TO THE PANDEMIC'S IMPACT ON ENTREPRENEURSHIP AMONG JILIN UNIVERSITY STUDENTS

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Abstract: University students play a pivotal role in a nation's economic progress and future social development. Fostering their innovation and entrepreneurial spirit is a central concern in higher education. This paper reviews research on the determinants of university students' willingness to innovate and embark on entrepreneurial ventures. Scholars have examined factors like entrepreneurial self-efficacy, entrepreneurial education, entrepreneurial attitude, and their interplay. Wang Y S and Ding F (2023) proposed a mechanistic model illustrating how entrepreneurial self-efficacy and entrepreneurial education, with entrepreneurial attitude as a mediating variable, directly influence university students' entrepreneurial willingness. They argue for expanded innovation and entrepreneurial education to bolster this willingness and creating a supportive campus environment to boost entrepreneurial self-efficacy [1]. Wu Z J and Zhou J (2022) have shown that the quality of entrepreneurial platforms not only directly impacts entrepreneurial intentions but also indirectly influences university students' entrepreneurial intentions through the mediating effect of happiness. They highlight the moderating effect of entrepreneurs' personalities in the relationship between entrepreneurial platform quality, happiness, and entrepreneurial intention [2].

Keywords: University Students, Entrepreneurial Willingness, Entrepreneurial Education, Entrepreneurial Self-Efficacy, Campus Environment

1. Introduction

University students are the reserve army of our country's economic construction and the mainstay of future social development. How to effectively enhance the willingness of university students to innovate and start their businesses has been a major focus of talent training in colleges and universities. Numerous experts and scholars have also conducted in-depth research on the subject and presented their views.

Some scholars have conducted related studies on the influential factors of innovation and entrepreneurial willingness among university students. Taking entrepreneurial self-efficacy and entrepreneurial education as independent variables, entrepreneurial attitude as mediating variables, and entrepreneurial willingness as dependent variables, Wang Y S and Ding F (2023) built a mechanism model for the influence of entrepreneurial willingness of university students, arguing that universities should further carry out innovation and entrepreneurial education to directly promote entrepreneurial willingness of university students. At the same time, universities should create a favorable campus atmosphere to improve university students' entrepreneurial self-efficacy to promote their entrepreneurial attitude and

thus enhance their entrepreneurial willingness [1]. Wu Z J and Zhou J (2022) found that the quality of entrepreneurial platform not only has a direct impact on entrepreneurial intention but also indirectly affects university students' entrepreneurial intention through the mediating effect of happiness. Among the relationship between entrepreneurial platform quality and happiness on entrepreneurial intention, the moderating effect of entrepreneurs' personalities is indispensable [2].

Numerous scholars have collected relevant data on the willingness of university students to innovate and start a business through questionnaires and conducted empirical studies. Yin Q and Yang J Y (2023) took 330 returning entrepreneurs who graduated from 1 to 5 years in Jiangsu Province as samples and adopted the covariance-based structural equation model (CB-SEM) to empiric-analyze the influence of the entrepreneurial environment in Jiangsu on the willingness of returning entrepreneurs [3]. Zhou X H and Ding D H (2023) conducted a questionnaire survey on undergraduates from six universities in Anhui Province, and analyzed the correlation between students' characteristics, family background, school education and social environment, and students' entrepreneurial intention [4]. Based on the three-way interactive decision theory and goal achievement theory, Chen S and Chang J Y (2022) adopted the questionnaire survey method to explore the role of entrepreneurial education on entrepreneurial intention in the context of new liberal arts construction and the moderating effect of entrepreneurial motivation on the above-mentioned relationship [5]. Based on the questionnaire data of 338 College of Economics and Management students, Ren Y S, Xu R Z, and Jiang H Y (2022) conducted an empirical analysis of university students' willingness to innovate and start businesses and its influencing factors by using the binary Logistics model [6]. Guo L J, Sun X Y, Xia J Y, et al. (2021) believe that university students returning home to start businesses will play an important role in promoting rural economic development and alleviating urban employment pressure. Therefore, they analyze the influencing factors of university students' willingness to return home to start businesses and conduct an in-depth analysis of the problems existing in the aspects of national policy support, college education support, and students' support [7]. Chen Z X, Zhu J and Huang S Y (2021) divided the modules affecting university students' willingness to innovate and start businesses into four dimensions: individual, family, university, and society, and collected relevant data through a questionnaire to explore the relationship between the above variables and university students' willingness to innovate and start businesses [8]. Based on the structural equation model, Lin R R (2021) studied the influence of factors from the three levels of society, individual, and university on the entrepreneurial willingness of university students majoring in e-commerce [9]. Yang H, Lu S R, and Chen W L (2020) obtained first-hand data through a questionnaire survey and interview and found that entrepreneurship education is related to entrepreneurial intention, and the effect of entrepreneurial training education has a positive impact on student's entrepreneurial intention. The ranking of student's evaluation of education is teachers' enthusiasm and effort, entrepreneurship classroom education, an entrepreneurship competition, entrepreneurship practical training, and entrepreneurship lecture [10].

Only one scholar has recently studied the impact of the COVID-19 pandemic on the willingness of public healthcare undergraduates to innovate and start businesses. Zhang H F, Chen Y, He Y, et al. (2023) conducted a questionnaire survey on 1117 students from 41 public medical undergraduate colleges in 27 provinces (autonomous regions and municipalities directly under the Central Government) and found that the COVID-19 pandemic reduced the satisfaction of university students' innovation and entrepreneurship courses, but increased their entrepreneurial willingness, and affected their entrepreneurial willingness through the intermediary role of the satisfaction of innovation and entrepreneurship courses [11].

Some academics have also researched countermeasures to increase the willingness of university students to innovate and start businesses. Zhu J Q and Liu C H (2022) believe that ideological education should be strengthened to stimulate internal needs, innovation, and entrepreneurship education should be infiltrated into professional courses to improve cognition, time and energy conflicts should be resolved through institutional guarantee, and multiple measures should be taken to create a normal atmosphere for innovation and entrepreneurship [12]. Liang Y X and Huang S W (2020) believe that the employment difficulties of college graduates have become more prominent during the prevention and control of the novel coronavirus epidemic. Under the new situation, it is necessary to improve university students' willingness to start their businesses from various aspects such as course arrangement, platform construction, and environmental construction [13].

In summary, several scholars have conducted related studies on the factors affecting the willingness of university students to innovate and start businesses, and the countermeasures to improve it. Numerous scholars have conducted empirical studies through questionnaires on issues related to the willingness of university students to innovate and start businesses, but there has been little empirical research on the impact of the novel coronavirus epidemic on the willingness of university students to innovate and start businesses. In particular, there is still no empirical study on the impact of COVID-19 on the willingness of university students in Jilin to innovate and start their own businesses. Therefore, we take this as a starting point for a related study in this paper.

2. Methods and Research Design

2.1. Questionnaire Survey

The objects of this questionnaire survey are college students in Jilin Province (including graduates). The questionnaire Star survey platform is used to accurately collect questionnaires for survey respondents, mainly by purchasing sample services. A total of 315 questionnaires were collected, of which 295 were valid and 20 were invalid. The basic information distribution of the survey subjects is given in Table 1.

Table 1: Basic information statistics of survey objects

Gender distribution	Male	43.05%
	Female	56.95%
Age distribution	17 to 22 years old	31.53%
	23 to 29 years old	38.98%
	30 to 39 years old	27.46%
	Age 40 and older	2.03%
The stage you are currently in	Currently in school	34.24%
	Graduated	65.76%

As shown in Table 1, the proportion of female respondents was relatively large at 56.95 percent. In terms of age distribution, they were predominantly between the ages of 17 and 39, with the highest proportion between the ages of 23 and 29, at 38.98%. The proportion of students who had already graduated was relatively strong in the survey, at 65.76 percent, while the proportion of students who were still studying was relatively minor.

2.2. Mood median test

To explore whether there are differences in the impact of COVID-19 on the willingness of students in different groups to innovate and start a business, this study used the Mood median test, a nonparametric test used to test the equality of the median values of two or more groups. In this way, it provides a non-parametric alternative to one-way ANOVA. The X variable is a discrete variable with two or more

properties, and the Y variable can be continuous, discrete ordinal, or discrete count, when the Mood median test comes into play.

The null hypothesis (H_0) is: there is no difference between the groups and the groups have equal medians.

The alternative hypothesis (H_1) is: there is a difference among the medians and groups.

If the P-value of the test result is less than 0.05, the null hypothesis is rejected, confirming a significant difference between the sample groups.

2.3. Research Design

To further analyze the differences in the impact of COVID-19 on the willingness of students in different groups to innovate and start their businesses, the following designs are carried out in this paper, as shown in Table 2.

Table 2: Research design

Number	Research Questions	Groups
1	Are there differences in the impact of COVID-19 on the willingness to innovate and start a business among samples of different genders?	Male
		Female
2	Are there differences in the impact of COVID-19 on the willingness to innovate and start a business among samples of different age groups?	17 to 22 years old
		23 to 29 years old
		30 to 39 years old
		Age 40 and older
3	Are there differences in the impact of COVID-19 on the willingness to innovate and start a business among the samples at different stages?	In school
		Graduated

3. Analysis of differences in the impact of COVID-19 on the willingness of students in different groups to innovate and start businesses

3.1. Normality test

To investigate the differences in the impact of COVID-19 on the willingness of students to innovate and start a business among different groups, this paper first conducted a normality test on the survey data, the results of which are shown in Table 3.

Table 3: Normality test

Question	Kolmogorov-Smirnov			Shapiro - Wilke		
	Statistics	Degree of freedom	Salience	Statistics	Degrees of Freedom	Salience
The impact of COVID-19 on your willingness to innovate and start a business	.167	295	.000	.929	295	.000

a. Rielly's significance correction

Due to the large sample size, the Kolmogonov-Smirnoff (K-S) test results are selected in this paper. As shown in Table 3, the data normalization test results have a significance of 0.000, which is less than 0.05. Therefore, the null hypothesis is rejected and it is concluded that the survey data does not fit a normal

distribution. Therefore, the Mood median test in the non-parametric test is used in this paper to further investigate the differences in the impact of COVID-19 on the willingness of students in different groups to innovate and start businesses.

3.2. Mood Median test

3.2.1. Gender

As a result of the novel coronavirus outbreak, people's daily lives, work, and studies have been considerably affected. The survey data collected in the questionnaire "The impact of COVID-19 on your willingness to innovate and start a business" are classified by gender, and the results are shown in Table 4.

Table 4: Survey data classified by gender

Question	Your gender (mean ± standard deviation)	
	Male (*n*=127)	Female (*n*=168)
The impact of COVID-19 on your willingness to innovate and start a business	6.82±1.586	6.75±1.684

As can be seen from Table 4, COVID-19 does have a large impact on the willingness of the sample population to innovate and start a business. Both men and women were significantly affected, with mean scores reaching 6.82 and 6.75 respectively. To investigate whether the COVID-19 pandemic had a significant difference in its impact on the willingness to innovate and start a business among the male and female sample populations, additional studies were conducted using the Mood median test, the results of which are presented in Table 5.

Table 5: Summary of Mood median test in independent sample 1

Total N		295
Median		7.000
Inspection statistics		0.608
Degree of freedom		1
Progressive significance (two-sided test)		0.435
Yates continuity correction	Chi-square	0.434
	Degrees of Freedom	1
	Progressive significance (two-sided test)	0.510

1. Multiple comparisons were not performed because the population test did not detect significant differences between samples

As can be seen from Table 5, the Mood median test has a significance of 0.510, which is greater than 0.05 for the independent sample. Therefore, the null hypothesis cannot be rejected, indicating that although both the male and female sample groups were considerably affected by the novel coronavirus epidemic, there was no significant difference between them in their willingness to innovate and start a business.

3.2.2. Age

The survey data obtained from the question "The impact of COVID-19 on your willingness to innovate

and start a business" are classified and summarized by age group, and the results are shown in Table 6.

Table 6: Survey data classified by age group

Question	Your age (mean ± standard deviation)			
	17 to 22 years old (*n*=93)	23 to 29 years old (*n*=115)	30 to 39 years old (*n*=81)	Age 40 and older (*n*=6)
The impact of COVID-19 on your willingness to innovate and start a business	6.13±1.527	6.95±1.680	7.27±1.414	7.00±2.530

As can be seen from Table 6, the impact of COVID-19 on the willingness to innovate and start a business varies slightly among the sample groups in different age groups. In terms of trends, the older the sample, the larger the effect. The 17-22 age group had the smallest mean score, which was significantly lower than the mean scores of the remaining groups. To further investigate whether there are significant differences in the impact of COVID-19 on the willingness to innovate and start a business among sample groups of different age groups, the Mood median test was adopted in this paper for additional research, and the results are shown in Table 7.

Table 7: Summary of Mood median test in independent sample 2

Total N	295
Median	7.000
Test statistics	28.507
Degrees of Freedom	3
Progressive significance (two-sided test)	0.000

As can be seen from Table 7, the significance of the Mood median test for the independent sample is 0.000, which is less than 0.05. Therefore, the null hypothesis is rejected, indicating that sample groups of different age groups show significant differences in the impact of COVID-19 on innovation and entrepreneurial willingness. The results of the inter-group comparison are shown in Table 8.

Table 8: Inter-group comparison results of Mood median test in independent samples

Sample 1- Sample 2	Test Statistics	Significance	Adjust significance
Age 17-22 – Age 23-29	18.901	0.000	0.000
Age 17-22 – Age 30-39	23.593	0.000	0.000
Age 17-22 – Age 40 and older	4.138	0.042	0.252
Age 23-29 – Age 30-39	0.750	0.386	1.000
Age 23-29 - Age 40 and older	1.146	0.284	1.000
Age 30-39 - Age 40 and older	0.064	0.801	1.000

Show progressive significance (two-sided test). The significance level was 0.05. The Bonferroni correction has adjusted significance values for multiple tests.

The results in Table 8 show that the differences in the impact of COVID-19 on the willingness to innovate and start a business are mainly found among people aged 17-22, 23-29, and 30-39 years. The average score for the 17-22 age group in the sample was just 6.13, while those aged 23-29 and 30-39 scored as high as 6.95 and 7.27. This shows that while the COVID-19 pandemic has had a huge impact on the production and lives of everyone, young people, relatively

speaking, have more courage and momentum and are not afraid of failure.

3.2.3. Current stage (in school or graduated)

The survey results of the question "The impact of COVID-19 on your willingness to innovate and start a business" are classified according to the different stages you are in, and the results are shown in Table 9.

As can be seen from Table 9, the COVID-19 pandemic has had a large impact on the innovation and entrepreneurial willingness of both university students and graduates, but the impact on university students has been relatively minor.

To further investigate whether there are significant differences in the impact of COVID-19 on the innovation and entrepreneurial willingness of the sample groups at different stages, the Mood median test was used for additional analysis and the results are presented in Table 10.

Table 9: Survey data classified by current stage(in school or graduated)

Question	Current stage (mean ± standard deviation)	
	In school (*n*=101)	Graduated (*n*=194)
The impact of COVID-19 on your willingness to innovate and start a business	6.27±1.574	7.05±1.614

Table 10: Summary of Mood median test in independent sample 3

Total N		295
Median		7.000
Inspection statistics		20.793
Degrees of Freedom		1
Progressive significance (two-sided test)		0.000
Yates continuity correction	Chi-square	19.654
	Degrees of Freedom	1
	Progressive significance (two-sided test)	0.000

1. Multiple comparisons are not performed because there are less than 3 check fields.

As can be seen from Table 10, there is a significant difference between the sample population at school and those who have graduated, in terms of the impact of COVID-19 on the willingness to innovate and start a business. The average score for this category among current students is 6.27, which is significantly lower than the average score of 7.05 among graduates, indicating that the impact of COVID-19 on the willingness of graduate students to innovate and start businesses is significantly higher than that of current students.

4. Conclusion

The analysis of differences in the impact of COVID-19 on students' innovation and entrepreneurship willingness of different groups shows that: First, there is no significant difference in the impact of COVID-19 on the innovation and entrepreneurship willingness of male and female sample groups, but their average score is elevated, indicating that COVID-19 does have a great impact on the innovation and entrepreneurship willingness of sample groups. Second, sample groups at different ages showed significant differences in the impact of COVID-19 on innovation and entrepreneurial willingness, mainly between ages 17-22, 23-29, and 30-39, with 17-22-year-olds scoring significantly lower on average than

the others. Third, the impact of COVID-19 on the willingness of graduates to innovate and start their businesses is significantly higher than that of university students.

The above analysis shows that although COVID-19 has a great impact on people's normal production and life, relatively speaking, it has the least impact on people aged 17 to 22 in terms of their willingness to innovate and start businesses, which adequately shows that they have more courage and motivation to fear failure. At the same time, given that the majority of people in this age group are university students, departments at all levels should introduce various preferential policies and measures to actively encourage university students to innovate and start businesses to ease employment pressure and promote local economic development. In addition, all colleges and universities should also make great efforts in innovation and entrepreneurship education, provide various convenient conditions for university students to accumulate knowledge and experience in innovation and entrepreneurship, and create a favorable atmosphere for learning and practice.

Acknowledgments

This paper is one of the phased achievements of the Social science Research planning project of the Education Department of Jilin Province in 2021 (Special project on Employment and Entrepreneurship Management) "Research on Cultivating and Improving Innovation and Entrepreneurship Ability of University Students in Jilin Province" (JJKH20220125JY).

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