



Cultivating students' entrepreneurial competence in the context of educational digitization

Constructing a knowledge map based on the impact of technological tools on entrepreneurial motivation

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Abstract. INTRODUCTION: With the rapid development of the digitalization of education, more and more students have started to acquire knowledge and information through the Internet and technological tools. In such a context, cultivating students' entrepreneurial ability has become one of the critical issues in the field of education. OBJECTIVES: This study aims to construct a knowledge map to analyze the impact of technological tools on students' entrepreneurial motivation in the context of the digitalization of education. METHODS: Adopts a combination of literature review and data analysis. RESULTS: Through the literature review, it was found that technological tools have a significant impact on students' entrepreneurial motivation in the context of education digitization. CONCLUSION: Technology tools are essential in stimulating students' entrepreneurial motivation and provide educators with practical strategies and methods to cultivate students' entrepreneurial ability.

Keywords: technology-assisted; technology tools; entrepreneurship; knowledge mapping.

1 Introduction

With the release of the Compulsory Entrepreneurship Curriculum [1], new requirements for entrepreneurship education have been put forward by national educational institutions in the context of the digitalization of education. Entrepreneurship education should reflect the principles of student-centered learning, respect individual differences and learning characteristics of students, pay attention to the impact of psychological factors on entrepreneurial motivation, and promote students' overall health and personal development, especially their psychological development. The curriculum standards indicate that emotional attitude is an essential factor in language learning and one of the five dimensions of language skills [2]. Assessing psychological factors and developing positive psychological qualities are critical to promoting student entrepreneurship. Positive psychology differs from traditional psychology, which focuses on

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Z. Zhan et al. (eds.), *Proceedings of the 2024 10th International Conference on Humanities and Social Science Research (ICHSSR 2024)*, Advances in Social Science, Education and Humanities Research 858,

https://doi.org/10.2991/978-2-38476-277-4_146

problem-solving behaviors. It considers positive factors such as happiness, success, and resilience and provides a new perspective on learning entrepreneurial skills in students. Therefore, effectively improving students' entrepreneurial skills and academic vigor is an important issue for researchers. Based on this, this paper presents a mixed study on the relationship between academic motivation, entrepreneurship, and academic performance from a positive psychological perspective.

2 Method

2.1 Research Questions and Objectives

According to the literature, the relationship between academic mobility, entrepreneurship, and academic performance in the digitalization of education has yet to be widely discussed [3]. This study aims to understand students' academic mobility and entrepreneurship and to investigate the relationship between academic mobility, entrepreneurship, and academic achievement. Therefore, this study poses three questions:

1. What is the student's academic level?
2. What are the entrepreneurial competencies of students?
3. What is the relationship between motivation, entrepreneurship, and academic performance?

The study included 300 randomly selected students from the first three parallel classes. There were several reasons for choosing between 1 and 3. To involve the students in the class in this study. First, high school students need to be more stable in order to understand how they learn thoroughly. Secondly, students have a lot of homework and exam pressure. Therefore, university grades 1-3 in the context of digitalizing education are more suitable for students. A questionnaire survey, interview, and interim evaluation method were used. Firstly, questionnaires were used to collect information to investigate students' motivation and entrepreneurial skills. Intermediate exams were used to collect intermediate exams reflecting students' performance. Interviews provided more quantitative information. The qualitative data were then analyzed using SPSS 26.0. The knowledge mapping of entrepreneurial skills was processed.

2.2 Analysis of the Questionnaire

Two questionnaires were developed for this study: a scientific questionnaire on buoyancy and an indicator questionnaire [4]. The questionnaire was divided into two parts in the context of educational digitization. The first part contains basic information about the subject for data collection and analysis, including name, gender, and ranking [5]. All positions in the second part were evaluated on a five-point Likert scale of "totally disagree" and "totally agree." If "1" means "completely contradictory" and "2" means "generally contradictory," then "3" means "uncertainty," "4" means "general agreement," and "5" means "general agreement." "5" indicates "complete agreement." The higher the score, the higher the academic vigor or entrepreneurship of the students. The scientific questionnaire used in the study was based on a modified academic volatility scale to test the academic volatility of students.

Model 1 of this paper is as follows:

$$X_n^{k+1} = AGF(x_n^k, \{x_i^k; i \in N_u\}) \tag{1}$$

x_n^k is a reordering of the *ID*s, so each additional reordering adds one more square to *K*, yielding X_n^{k+1} .

$$X_u^{(k+1)} = \sum_{i \in N_u} \frac{1}{\sqrt{N_u} \sqrt{N_i}} x_i^k \tag{2}$$

$$X_i^{(k+1)} = \sum_{u \in N_i} \frac{1}{\sqrt{N_i} \sqrt{N_u}} x_u^k \tag{3}$$

$$X_j^{(k+1)} = \sum_{i \in N_j} \frac{1}{\sqrt{N_j} \sqrt{N_i}} x_i^k \tag{4}$$

Equations (2), (3), and (4) $X_u^{(k+1)}$ $X_i^{(k+1)}$ $X_j^{(k+1)}$ all make better use of serial summation, so they all add one more square to the *K*+1th power.

Model 2 is as follows:

$$\textit{Similarity}(u, i) = x_u^k (x_i^k x_j^k) \tag{5}$$

$$x_u = \frac{1}{k+1} \sum_{k=0}^k x_u^k \tag{6}$$

$$x_i = \frac{1}{k+1} \sum_{k=0}^k x_i^k \tag{7}$$

In Model 2, in the context of digitization of education, similarity is mainly used to measure the impact of auxiliary tools on the progress of data map development and present the original model's separation results. The entrepreneurship survey was mainly conducted through the Entrepreneurship Survey website. This online survey was sent to 60 students through the application. In the context of digitization of education, students do not receive formal education, but the program reaches their level of entrepreneurship—screening of completed web queries. Reliability analysis showed that Klenbach's alpha - 0.857 was more significant than 0.7, and alpha coefficients in all measures were 0.793, 0.855, 0.862, and 0.833, respectively. The findings indicate that the questionnaire has high internal reliability.

Due to the Bartlett-Ball test, the values of the questionnaire and each measure are 0000, indicating the correlation of the measures. Therefore, the revised questionnaire has good internal consistency and structural correlation and can be used for large-scale data collection in this study. In the context of the digitization of education, this study used 15 students to validate the findings and obtain more information from the students to rationalize and make more sense of the findings. The interview questions should have been asked in Chinese to avoid language barriers and to obtain more information. There were five questions, the first two of which dealt with understanding learning objectives, behavior, desire to learn, and attitudes of entrepreneurial students. In the context of the digitalization of education, two other questions dealt with students' feelings and attitudes toward school stress and failure. The last question dealt with students' perceptions of the impact of academic vigor and entrepreneurship on academic performance.

Model 3 is as follows:

$$L_{BPR} = \sum_{u=1}^u \sum_{i \in N_u} \sum_{j \in N_u} \ln \sigma(y_{ui} - y_{uj}) + \lambda |E^0|^2 \tag{8}$$

Model 3 L_{brp} is a calculation of the re-ranking of the model system.

The total score of this test is 100 points. In the context of the digitization of education and to ensure the reliability of the test results, the intermediary's documents shall be kept confidential during the test. All documents are assessed online and comply with the city's assessment criteria. Therefore, it is relatively efficient and reliable in the context of the digitalization of education, which means that students can collect midterm exam results to analyze their level of success.

2.3 Construction of Visual Graph

According to previous research, students are able to identify and correct errors in the process of entrepreneurship education. However, students do not have a complete understanding of the use and application of guided learning strategies, which means they have difficulties in listening, speaking, reading, and writing. See Figures 1 and 2.

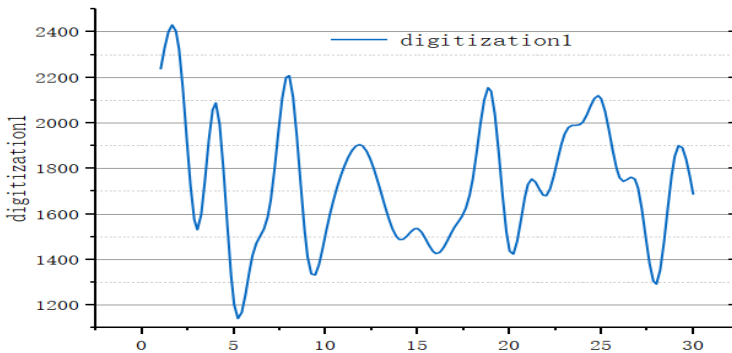


Fig. 1. Progress of research on visualization mapping (1)

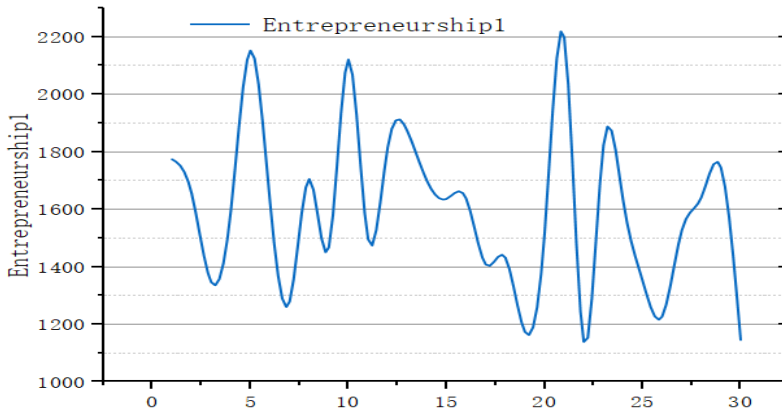


Fig. 2. Progress of research on visualization mapping (2)

3 Discussion

In this study, all interviews were based on clear and comprehensive data. SPSS 26.0 was used for the categorization and evaluation of quantitative data. The steps of data analysis are as follows: First, the students' entrepreneurship test results were analyzed in the context of the digitalization of education, describing their learning outcomes and grouping them according to their level of entrepreneurship. Second, descriptive statistical analysis answered questions related to students' motivation and entrepreneurship. Third, in the context of the digitalization of education, this study examined the relationship between academic mobility and academic achievement, entrepreneurship and academic achievement, and academic mobility to determine differences in entrepreneurial skills and motivation among students of different genders and levels of entrepreneurship. Regression analyses tested whether entrepreneurial skills conveyed the relationship between motivation and academic achievement. Interviews and recordings can also be edited and recorded in real-time using Microsoft Word 2019 in the context of digitizing education. All interviews were provided with a unique identifier, which was analyzed to supplement the quantitative information. The results show a descriptive analysis of the different learning motivation variables, including maximum, minimum, mean, and standard deviation. Descriptive statistics include internal interest, external needs, learning, the value of learning, and effort in the context of the digitalization of education. Descriptive statistics showed that students are more motivated to learn ($M=4.50$, $SD=0.85$). Among them, internal interest was the highest in the context of educational digitization ($M=4.60$), followed by external needs ($M=2.59$) and value of learning ($M=3.44$). The mean values of each item in the context of educational digitization indicate that student's motivation to learn does not develop in sequential order but in the order of internal interest, external needs, learning values, learning environment, and effort. The above data indicate that student's motivation to learn is relatively high in the context of the digitalization of education. As mentioned above, the mean

value of the five dimensions is greater than 4, indicating that students acquire good motivation—maximum internal velocity ($M=4.60$, $SD=0.94$). The results indicate that students need to be more motivated to learn. Maximum internal interest and minimum external demands.

4 Conclusion

Through surveys and interviews, the study revealed the characteristics of entrepreneurial skills, academic motivation, and the relationship between entrepreneurship, entrepreneurship, and academic performance. The conclusions are as follows: First, the study used descriptive statistics and independent t-tests to analyze students' overall level and differences in academic mobility. Next, descriptive statistics and independent tests were used to analyze the four dimensions and entrepreneurship levels. There is a significant difference between students and students of low-income brackets in overall competence in entrepreneurship and its four dimensions. Higher-level students have higher entrepreneurial skills and four dimensions than lower-level students.

Acknowledgment

This study was supported by the 2023 Higher Education Research Project "Research on Employment and Entrepreneurship Education for Nursing Students in Higher Vocational Colleges under the Background of Educational Digitization" (grant number:23GJYBC051) of the Heilongjiang Association of Higher Education.

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