



Collaborative Integration Design of Guangxi Business Cases and Innovation and Entrepreneurship Based on Big Data

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Abstract. Under the background of entrepreneurship and innovation, using big data to drive the reform of innovation and entrepreneurship education and relying on local business groups to carry out innovation and entrepreneurship education is a topic worthy of study. Taking the native Guangxi business as the research carrier, this paper firstly analyzes the research status of Guangxi business and innovation and Entrepreneurship with the bibliometric method. And based on polynomial fitting prediction, the research growth model was designed and predicted and the enlightenment of big data on entrepreneurship and entrepreneurship education is sorted out. Secondly, the curriculum design of collaborative integration of Guangxi business cases and innovation and entrepreneurship is carried out. By using two teaching organization methods, which are the mixture of theory and practice, and the mixture of inside and outside the school, the entrepreneurial case of Guangxi business is integrated into the “two mixtures” of curriculum design, and the participation and integration of entrepreneurial cases of Guangxi business and the whole learning experience of students are always emphasized, so as to enhance students’ practical application ability in the process of participation and experience. It realizes the integrated curriculum design of data-driven collaborative integration of Guangxi business cases and innovation and entrepreneurship, which provides data support and practical path for the education of Guangxi business cases and innovation and entrepreneurship in colleges and universities.

Keywords: Big Data Technology · Data Driven · Guangxi Business Cases · Innovation and Entrepreneurship Education · Curriculum Design

1 Introduction

Big data is changing people’s way of production, life, scientific research and education, and we have stepped into the era of big data [3, 4, 8]. The opening, sharing, mining and application of data can not only promote economic development and benefit society, but also drive the reform in the field of education [1, 5]. The General Office of the State Council issued the *Implementation Opinions on Deepening the Reform of Innovation and Entrepreneurship Education in Colleges and Universities*, and put forward the reform of

teaching methods and corresponding measures: “build a platform for entrepreneurship and innovation, and enhance the supporting role. Use big data technology to master different students’ learning needs and rules, and provide richer and more diverse educational resources for students’ autonomous learning”. In the era of big data, how does big data drive innovation and entrepreneurship education reform [6]? How to use big data technology to collect innovation and entrepreneurship data, deeply tap and analyze the potential significance of the data, and let the data “speak” [7]? How to deepen the application of big data in innovation and entrepreneurship education, improve the quality and scientificity of innovation and entrepreneurship education, and make big data better serve for innovation and entrepreneurship education [2]? How to use big data to better cultivate innovative and entrepreneurial talents? These problems are worth studying. Therefore, firstly, based on big data, this paper uses the literature information of CNKI, adopts the bibliometric method and co-word analysis, and studies the collaborative integration of Guangxi business cases and innovation and entrepreneurship in the form of knowledge map. Then, the curriculum design of collaborative integration of Guangxi business cases and innovation and entrepreneurship is put forward, in order to provide theoretical support and reference for the integrated development of Guangxi business and innovation and entrepreneurship education in Guangxi’s universities.

2 Big Data Research on Collaborative Integration of Guangxi Business Case and Innovation and Entrepreneurship

Taking CNKI as the retrieval platform, academic journals, dissertations, conference papers and newspapers as the sample sources, the theme retrieval was carried out. The deadline was March 20th, 2022, with the retrieval conditions of “Guangxi business or innovation and entrepreneurship”. 99 research literature related to scientific research achievements and practical teaching were retrieved, including 96 journal papers and 3 newspaper articles. When the retrieval condition is only “Guangxi business”, there are 122 research literature with relevant results, including 103 journal papers, 2 degree papers and 7 newspaper articles. When the retrieval condition is that “Guangxi business cases”, there are 5. When the retrieval condition is “Guangxi business cases or innovation and entrepreneurship”, no literature can be found. Based on the data with the retrieval conditions of “Guangxi business or innovation and entrepreneurship”, this paper quantitatively analyzes the annual trend of published literature, relevant research institutions and research keywords, and qualitatively analyzes the main research hotspots and highlights.

2.1 Research Trend Prediction

As the statistical data is up to March 2022, the data in 2022 is not complete. As can be seen from the trend chart of the number of research literature in Fig. 1, the earliest domestic literature on Guangxi business and innovation and entrepreneurship was published in 2008. Since then, the research has been slowly improved, but the amount is small. By 2018 to 2020, the relevant research results have increased, especially up to 26 in 2019. In order to better simulate the growth rule of the number of literature issued by Guangxi

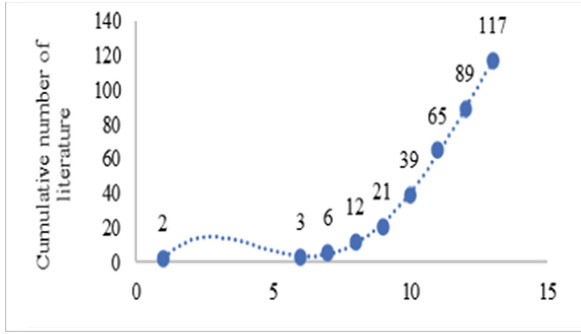


Fig. 1. Research trend of Guangxi business and innovation and entrepreneurship

business and innovation and entrepreneurship academic literature, this paper makes statistics on the cumulative number of literature issued. Assuming that the cumulative number of literature is a continuous differentiable function of time, i.e. $f = f(t)$, and the maximum number of literature is K , the literature growth model is as follows:

$$\frac{df}{dt} = rf\left[1 - \frac{f}{K}\right], 0 < r < 1 \tag{1}$$

To simplify the independent variable data, the starting year 2008 is set as 1, and so on, and curve fitting is carried out according to the cumulative number of literature in Fig. 1. The fitting curve formula is as shown in Eq. (2), where $R^2 = 0.9991$, indicating that the fitting degree between the predicted curve and the actual data is very high. According to the predicted data, there will be a total of 143 research literature on Guangxi business and innovation and entrepreneurship in 2022, and the peak research literature in this research field will probably reach about 175 papers in 2024.

$$K = -0.0302t^4 + 1.0219t^3 - 9.9746t^2 + 34.096t - 23.135 \tag{2}$$

2.2 Comparison of Research Institutions

Figure 2 shows the top 10 relevant research institutions. It can be seen that only a small number of domestic colleges and universities have conducted research on Guangxi business and innovation and entrepreneurship, relatively more of which are Nanning University, Changjiang Polytechnic, Jinhua Polytechnic, but there are only 3 to 5 articles. It shows that the amount of literature in research institutions accounts for a very small proportion, and research results are very scattered.

2.3 Research Topic Relevance

The frequency of the top 10 keywords is shown in Fig. 3. As can be seen from the figure, relevant universities have conducted extensive research on innovation and entrepreneurship, cross-border e-commerce, e-commerce talents, innovation and entrepreneurship

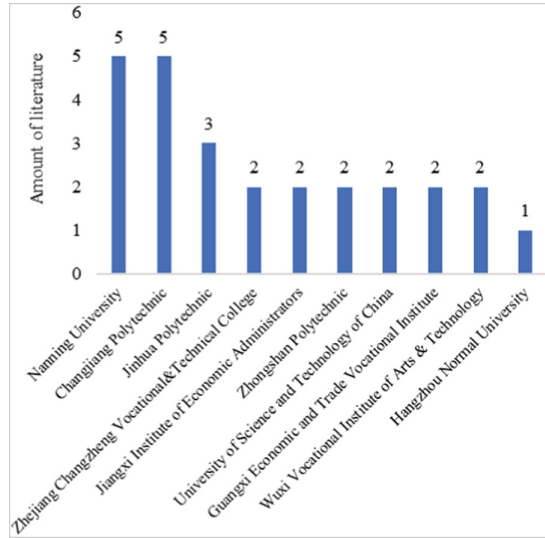


Fig. 2. Top 10 research institutions of Guangxi business and innovation and entrepreneurship

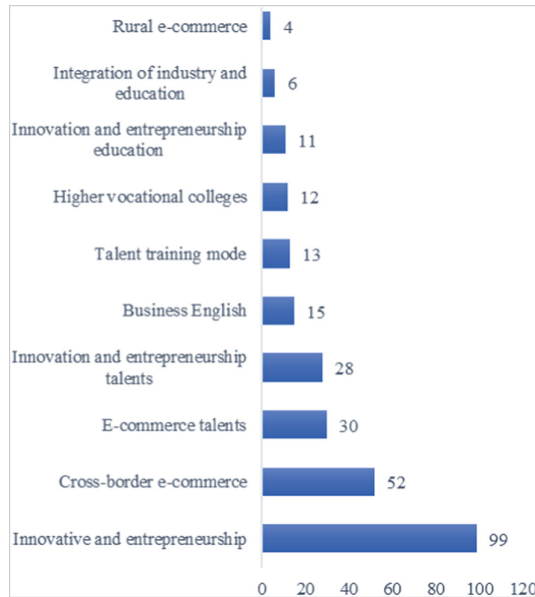


Fig. 3. Top 10 research topics of Guangxi business and innovation and entrepreneurship

talents, business English, talent training mode, higher vocational colleges, innovation and entrepreneurship education, integration of industry and education, rural e-commerce, etc. However, there is little research on integration of Guangxi business and innovation and entrepreneurship, which indicates that further research and exploration are needed.

3 Curriculum Design of Collaborative Integration of Guangxi Business Cases and Innovation and Entrepreneurship

Through the analysis and research of mixed learning and mixed teaching at home and abroad, combined with the requirements of the syllabus of innovation and entrepreneurship course and the actual situation of students, the mixed learning and mixed teaching mode of innovation and entrepreneurship education is constructed based on the case study of Guangxi business. In the course design, the “Two Mixtures” - the mixture of theory and practice, and the mixture of inside and outside the school, are used to integrate the entrepreneurial case of Guangxi business into the “Two Mixtures” of the course design, with “learning-centered” and “student-centered”, always emphasizing students’ participation, integration and whole-process experience, so as to improve students’ practical application ability in the process of participation and experience.

3.1 Design of Curriculum Orientation

The orientation of this curriculum design is to cultivate students’ comprehensive qualities such as consciousness, thinking and skills of innovation and entrepreneurship, so that students can learn to think about problems like Guangxi entrepreneurs and face the problems in society and life. Through the course study, students are required to master the knowledge related to innovation and entrepreneurship, to have the ability to apply the process of innovation and entrepreneurship, and to have the skills to build teams and team culture which can be put into practice. The course is divided into two parts: theory and practice. In the theoretical part, Guangxi business cases and high-quality online course resources are mainly used to learn the theories and tools related to innovation and entrepreneurship. In the practical part, the combination of competition and teaching, on-campus and off-campus mixing, innovation and entrepreneurship competition and simulated start-up of enterprises are used to carry out the course teaching and assessment.

3.2 Combination of Theory and Practice

3.2.1 Theory Study of Guangxi Business Cases

Theory study of Guangxi business cases are realized through teachers’ lectures and cases reading. Teachers focus on teaching the design ideas, design contents, design methods and assessment methods of the curriculum, and highlight the theory and practice, mixed learning inside and outside school, new mixed teaching mode and new experience. The members of the study group read the cases in depth, and master the situation of Guangxi’s enterprises, business leaders, business management, etc. After reading, they set up about 3 research questions for the selected cases, sort out and answer the questions.

3.2.2 Students Watching Guangxi Business Entrepreneurship Micro Video

The videos watched by students are videos of entrepreneurship of Guangxi business prepared by teachers in advance according to the learning content. The videos are hung in the school learning management system, and students can watch and learn after logging

in with their student ID. Students can have a further understanding of the characters and Guangxi business cases by watching the video, which lays a good understanding foundation and ideological preparation for the next step into Guangxi business.

3.2.3 Teachers and Students Polishing the Business Plan for Starting a Business

Business plan is market-oriented and problem-oriented. Teachers and students go out of the campus together and into Guangxi business, look for business pain points in the market, exchange and learn entrepreneurial problems with Guangxi entrepreneurs. Then, they select entrepreneurial projects, write and polish business plan together. The basic structure and content of the business plan are mainly polished and improved, market research and analysis are deeply conducted, and problems and difficulties that may be encountered in business are analyzed.

3.2.4 Organizing Innovation and Entrepreneurship Competition in School

Carrying out competition activities related to innovation and entrepreneurship is a good way to improve students' innovation and entrepreneurship ability. This kind of competitions is divided into college-level trials, school-level rematch and school-level finals. Excellent projects are selected to participate in the road show of in Guangxi entrepreneurs through the third-level race, so as to achieve the purpose of promoting teaching, learning and competition.

3.3 Mixing Inside and Outside the School

3.3.1 Inviting Guangxi Entrepreneurs into the Classroom

Guangxi entrepreneurs are invite to come to the school to participate in innovation and entrepreneurship teaching activities to help improve students' innovation and entrepreneurship ability. For example, inviting the entrepreneurs to participate in the demonstration meeting of the school's talent training plan, the demonstration meeting of the school's specialty setting, the curriculum reform and practice, the specific curriculum teaching, the guidance of students' competition activities, the practical teaching and training of students, so as to make Guangxi entrepreneurs an important part of the school's faculty.

3.3.2 Carrying Out Entrepreneurship Sand Table Training in the School

The school sets up college students' Guangxi business innovation and entrepreneurship associations to carry out various innovation and entrepreneurship activities, and the sand table training are carried out through the student associations. Then, more students can know about innovation and entrepreneurship, stimulate their passion for it, ignite their dreams of it, and enhance their ability of it through knowing Guangxi business, entrepreneurs and corporate culture.

3.3.3 Students Walking into Guangxi Business Enterprises

Encourage and require students to walk into Guangxi business enterprises, get close contact with Guangxi entrepreneurs, and personally experience the entrepreneurial cases and stories of Guangxi business through roadshows of entrepreneurial projects, interviews with entrepreneurs, visits and apprenticeships, etc.

3.3.4 Students Trying of Starting a Business

The school provides venues, basic equipment and other conditions in the College Students Pioneer Park to support college students to start enterprises, incubate start-up enterprises, introduce the business management model of Guangxi business, and invite entrepreneurs to give training guidance in technology, management and operation. Theoretical study, competition practice, business guidance ultimately serve for real entrepreneurship. Students should really take the first step to truly understand the essence of innovation and entrepreneurship, so that they can exercise and grow in actual entrepreneurship. Although there are many cases of failure, students must try bravely to understand the true meaning of innovation and entrepreneurship education.

3.4 Designing the Curriculum Evaluation

The innovation and entrepreneurship education course implements open and dynamic classroom evaluation, and the total score of the course is comprehensively evaluated by combining theoretical teaching results and practical teaching results. The mixed evaluation is carried out inside and outside the school, and the evaluation adopts the percentage system. Theoretical teaching achievement accounts for 30%, and practical teaching achievement accounts for 70%. In the first part, the score of theoretical teaching achievement is 35% of the video watching course plus 40% of the business plan for entrepreneurship plus 25% of the reading of Guangxi entrepreneurship cases. In the second part, the score of practical teaching achievements is 20% of entering Guangxi enterprises plus 50% of taking part in innovation and entrepreneurship competitions plus 30% of starting enterprises. Both these two part are recorded as the percentage system.

4 Conclusions

Big data analysis shows that based on the bibliometric and co-word analysis of CNKI and based on the polynomial prediction model, it can be seen that the cumulative number will reach 143 in 2022, and the peak research literature will probably reach about 175 in 2024.

From the research perspective, there is little research on entrepreneurship in Guangxi, and even less research on cross-integration with innovation and entrepreneurship curriculum teaching. This paper takes the cross-integration of local entrepreneurship cases in Guangxi and innovation and entrepreneurship curriculum teaching as the breakthrough point, which can be said to be an innovation in this field, and the research perspective is relatively new.

In terms of research content, this paper applies the entrepreneurship case of Guangxi to the teaching of innovation and entrepreneurship education. The teaching reform of innovation and entrepreneurship course is carried out from four dimensions: curriculum resources, curriculum content, curriculum implementation and curriculum evaluation. Together with the Guangxi entrepreneurs, the course is jointly developed, the course teaching is jointly implemented, the competition training is jointly conducted and the course effect is jointly evaluated. Accordingly, this paper should realize the innovation of content to a great extent.

The innovation of this curriculum evaluation is conducted in an open way, with the mixed evaluation of theory and practice, inside and outside the school, and the proportion of the results of practical teaching and competition training is increased. Guangxi entrepreneurs participate in the evaluation and guidance of students' entrepreneurial competitions and starting enterprises. This "mixed" and "open" evaluation method breaks the traditional singleness of "one teacher, one classroom, one test paper and one score". Innovation has been made in the evaluation concepts and methods, which can better evaluate the comprehensive quality and ability of innovation and entrepreneurship education of students in application-oriented universities.

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