Social Medicine and Health Management (2024)
Clausius Scientific Press, Canada

DOI: 10.23977/socmhm.2024.050206
ISSN 2616-2210 Vol. 5 Num. 2

The Influence of Professional Courses and Ideological and Political Education in Medical Colleges on Students' Innovation and Entrepreneurship under the Background of "New Medicine"

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Keywords: New Medicine, Specialized Courses in Medical Universities, Ideological and Political Education, Students' Innovation and Entrepreneurship

Abstract: Nowadays, "new medicine" comes into being, which puts forward higher requirements and brand-new challenges for medical education. Under this background, how to improve students' Innovation and Entrepreneurship (IE) ability through the organic integration of professional courses and ideological and political education has become an important problem to be solved urgently. Through the case study of Baotou Medical College, combined with questionnaire survey, in-depth interview and data analysis, this study systematically discusses the influence mechanism and realization path of professional courses and ideological and political education on students' IE ability. Firstly, the study collected a large number of data through questionnaire survey, and used descriptive statistics and correlation analysis methods to reveal the specific influence of different educational models on students' IE willingness and ability. Secondly, through in-depth interviews, more qualitative data about students' personal experiences and feelings were obtained. Finally, combined with case analysis, the successful experience and existing problems of IE education in Baotou Medical College are analyzed in detail. The IE practice opportunities provided by the school have been well evaluated (with an average of 3.9), which shows that the school has done a relatively full job in providing a practice platform. The value of this study lies in providing theoretical support and practical guidance for medical colleges to improve students' IE ability under the new situation, and putting forward specific implementation paths and policy suggestions for further deepening medical education reform and cultivating high-quality medical talents.

1. Introduction

Nowadays, the modern medical education is facing severe challenges. Under this background, the concept of "new medicine" came into being, emphasizing the close combination of medical education with modern science and technology and social needs in order to cultivate high-quality

medical talents with innovative spirit and social responsibility. However, at present, there are still many problems in the integration of professional curriculum and ideological and political education in medical colleges, especially in how to effectively improve students' IE ability, and there is still a lack of systematic research and practical guidance. Therefore, it is of great theoretical and practical significance to discuss the influence of professional courses and ideological and political education on students' IE under the background of "new medicine".

The main content of this paper includes the investigation and analysis of the current situation of professional courses and ideological and political education in medical colleges, and discusses the specific influence mechanism of them on students' IE ability. In the research method, questionnaire survey, in-depth interview and case study are adopted. Through the detailed analysis of Baotou Medical College, this paper reveals its successful experience and existing problems in IE education, and then puts forward some optimization suggestions. The research in this paper not only provides a new perspective and theoretical support for medical colleges to improve students' IE ability under the background of "new medicine", but also provides a specific operational path and reference for the formulation and practice of educational policies.

The structure of this paper is as follows: first, this paper reviews the existing literature to clarify the important role of professional courses and Civic and Political Education in medical colleges and universities and their deficiencies; then, this paper describes the research methodology in detail, including the questionnaire design, data collection and analysis methods; next, this paper presents the results of data analysis and explores the mechanism of the influence of professional curriculum and Civic and Political Education on students' IE competence; finally, combined with the case study of Baotou Medical College, this paper puts forward specific suggestions to optimize the professional curriculum and Civic and Political Education, and sums up the main conclusions of the study and the direction of future research. Through this structural arrangement, this paper aims to provide systematic theoretical and practical guidance for the reform of medical education in the context of the “new medical science”.

2. Related Work

Under the background of "new medicine", it is of great significance to study the integration of professional courses and ideological and political education in medical universities. It can not only promote the deep combination of medical education and modern science and technology, but also cultivate medical talents with innovative ability and social responsibility, and also provide theoretical basis and practical guidance for medical education reform in the new era. On the basis of analyzing the concept and connotation of innovative literacy and related research status, Lin Kai constructed an evaluation index system of IE literacy in higher vocational colleges, designed a questionnaire, and took Guangdong Polytechnic as the research object to analyze the current situation of innovative literacy of higher vocational students [1]. Liu Bing thinks IE is the embodiment of the spirit of the times [2]. Ma L believes that the entrepreneurial intention of college students is influenced by school education and society [3]. Maritz A believes that there is little research on college students' start-ups and students' entrepreneurial ecosystem at present [4]. SuY identified innovation and entrepreneurship education among college students as a key challenge [5]. However, most of the existing studies focus on a single curriculum reform or ideological and political education, and there is no systematic discussion on the organic combination of the two. In addition, many studies have some problems in empirical analysis, such as insufficient data and limited samples, which fail to fully reveal the comprehensive influence of professional courses and ideological and political education on students' IE ability.

The research on IE ability of medical college students is of urgent practical significance at

present, aiming at cultivating more medical talents with innovative spirit and practical ability for the society. This research can not only provide new ideas for IE education in colleges and universities, but also promote the deep connection between medical education and social needs. Pittaway L established the IE spatial process model of college students [6]. Mi 'rajiatinaurd thinks that unemployment is still a problem at present. Employment opportunities have become a factor of social unemployment [7]. Sasmita D implemented a student worksheet based on entrepreneurial innovation, and increased students' entrepreneurial innovation opportunities by developing candied nutmeg products [8]. Purnamawati N K's research aims to determine the partial and simultaneous influence of entrepreneurship education and family environment on students' entrepreneurial interest during college [9]. Siivonen P T has constructed and standardized the identity of collective entrepreneurship in the entrepreneurial society [10]. However, the existing research mostly focuses on entrepreneurship education in general colleges and universities, and pays little attention to this special field of medical colleges and universities. At the same time, the existing literature often lacks in-depth analysis of the specific influence mechanism of IE ability, and fails to fully reveal the synergistic effect of ideological and political education and professional courses in improving students' IE ability.

3. Method

3.1. The Influence of Professional Courses and Ideological and Political Education in Medical Universities on Students' IE

(1) The implementation of ideological and political education

In the specific implementation process, the school makes students understand and identify with the "socialist core values" in practice through special lectures, social practice, volunteer service and other forms, and enhance their sense of social responsibility and dedication.

(2) The influence of specialized courses on students' IE

The influence of professional courses on students' IE ability is mainly reflected in three aspects. The first is the construction of knowledge system. Through systematic and specialized course study, students have mastered solid medical knowledge and laid the foundation for IE. Secondly, it is the cultivation of practical ability.

(3) The influence of ideological and political education on students' IE

Ideological and political education plays an important role in cultivating students' IE quality. First of all, it can guide students to establish a correct concept of entrepreneurship, emphasizing that entrepreneurship is not only the way of personal success, but also the embodiment of social responsibility.

We can quantify students' IE ability through a comprehensive scoring formula, and carry out a weighted average of multiple influencing factors:

$$C = w_1 \cdot K + w_2 \cdot S + w_3 \cdot T + w_4 \cdot R \quad (1)$$

C represents the comprehensive score of students' IE ability, K represents their professional knowledge level, S represents their practical ability, T represents their teamwork ability, and R represents their sense of social responsibility, and W1, W2, W3, W4 are the weight of each factor.

3.2. Medical College Students IE Ability Evaluation System Construction

(1) The connotation and structure of students' IE ability

The connotation of IE ability of medical college students includes innovative thinking, problem solving, teamwork, leadership and market awareness. Specifically, innovative thinking emphasizes

that students can think creatively and propose new solutions; problem-solving ability involves students' coping strategies when facing professional challenges; teamwork and leadership refers to the ability to effectively communicate and guide the team to the goal in a team environment; market awareness involves the ability to transform medical innovation into viable commercial products or services.

(2) Establishment of evaluation index system

In order to construct the evaluation index system of medical college students' IE ability, it is necessary to refine the specific evaluation index from the above-mentioned ability connotation. For example, innovative thinking can be measured by the quantity and quality of scientific research projects, published papers and patents that students participate in; problem-solving ability can be evaluated by students' performance and achievements in dealing with practical medical problems; teamwork and leadership can be measured by team project participation and leadership role-playing; mrket awareness can be evaluated by students' participation in the business plan competition and the success rate of actual entrepreneurial projects.

Through the regression analysis model, we can evaluate the specific impact of different educational models on the improvement of students' ability:

$$\Delta C = \beta_0 + \beta_1 E_1 + \beta_2 E_2 + \beta_3 E_3 + \epsilon \quad (2)$$

ΔC represents the change value of students 'IE ability, E_1 represents the degree of professional curriculum reform, E_2represents the implementation of ideological and political education,E_3 represents the frequency and quality of practical teaching, $\beta_0$is the intercept term, $\beta_1, \beta_2, \beta_3$is the regression coefficient, reflecting the impact of each variable on the improvement of students' ability, ϵ is the error term.

(3) Design and implementation of the scale

In order to quantify the above evaluation indicators, it is necessary to design a scale with multiple dimensions. The scale design should include but not limited to self-rating scale, peer evaluation and tutor evaluation to ensure the comprehensiveness and objectivity of evaluation.

(4) Perfection and application of evaluation system

The successful application of the evaluation system also needs the support of medical colleges and educational administrators. Incorporating this evaluation system into the system of students' comprehensive quality evaluation and teaching quality control can not only promote the improvement of students' ability, but also serve as an important reference for educational reform and curriculum adjustment.

Through such an evaluation system, we can more scientifically grasp the current situation of IE ability of medical college students, and then promote the rational allocation of educational resources and the innovation of teaching methods, and finally achieve the goal of improving the overall quality of education [11-12].

In order to explore the interaction between professional courses and ideological and political education, we can use interactive item analysis:

$$C = \gamma_0 + \gamma_1 K + \gamma_2 S + \gamma_3 (K \cdot S) + \epsilon \quad (3)$$

K represents the influencing factors of professional courses, γ_0 is the intercept term, $\gamma_1, \gamma_2, \gamma_3$are the regression coefficient, reflecting the degree of each variable and its interaction term on students' ability.

3.3. Analysis of the Influencing Factors of Professional Courses and Ideological and Political Education in Medical Universities on Students' IE

The influence of external environment on medical college students' IE is mainly reflected in

economic, technical and cultural aspects. The stability and development level of the economic environment directly affect the opportunities and risks of starting a business. For example, a prosperous region may provide more financial support and market opportunities.

Through the growth model, we can describe the trajectory of students' ability growth in the whole education process:

$$C(t) = C_0 + \alpha t + \frac{1}{2}\beta t^2 \quad (4)$$

$C(t)$ represents the students' IE ability at time C_0 represents the initial IE ability α is a primary term coefficient, reflecting the linear growth rate, β is the quadratic term coefficient, reflecting the linear growth rate, and a quadratic coefficient, and reflecting the acceleration of growth. These formulas can help us quantify and analyze the influence of professional courses and ideological and political education in medical universities on students' IE ability under the background of "new medicine".

4. Results and Discussion

4.1. Empirical Data Collection and Analysis

Table 1: Some survey data collected by Baotou Medical College

Investigation project	Investigation content	Average value	Standard deviation
Innovation willingness	How interested are you in participating in innovative projects?	4.2	0.8
Entrepreneurial intention	How interested are you in entrepreneurship?	3.6	0.9
Practical opportunities	Do you think the IE practice opportunities provided by the school are sufficient?	3.9	0.7
Teacher support	Do you think the mentor provided sufficient guidance and support in IE?	4	0.6
School enterprise cooperation	How many times have you participated in school enterprise cooperation projects?	2.5	1.2
Innovative courses	What do you think of the quality of IE courses in the school?	3.8	0.7
Participation rate of entrepreneurship competition	Have you participated in entrepreneurship competitions organized by your school? (1=No, 2=Yes)	1.7	0.4
Entrepreneurial success rate (alumni data)	Have you successfully founded or participated in the establishment of a company? (1=No, 2=Yes)	1.3	0.5
Entrepreneurial funding support situation	Have you received entrepreneurial funding support from schools or external organizations? (1=No, 2=Yes)	1.4	0.5
Recognition of ideological and political education	Do you think ideological and political education is helpful for your IE? (1=No, 5=Very helpful)	3.7	0.8

This study mainly collected various types of empirical data, including questionnaires, face-to-face interviews and public data, in order to comprehensively evaluate the IE ability of

medical college students. The specific data sources include students and teachers of Baotou Medical College, and alumni network information related to IE. The analysis method mainly adopts quantitative statistics and content analysis. Quantitative statistics is used to process questionnaire data to reveal the relationship and influence of different variables; content analysis is used to process interview records in order to deeply understand the individual's views and experiences on IE.

In this study, we collected abundant empirical data through questionnaires, face-to-face interviews and public data. These data cover students' IE willingness, actual entrepreneurial behavior, educational background and resource support provided by the school. The following is a part of the survey data collected from Baotou Medical College.

Some survey data collected by Baotou Medical College are shown in Table 1.

This data table collected from Baotou Medical College provides insights into students' IE will and environment. As can be seen from the table, students' interest in participating in innovative projects is relatively high (with an average of 4.2), which shows that medical college students generally have strong innovation motivation. However, their interest in direct entrepreneurship is relatively low (with an average of 3.6), which may reflect students' concerns about entrepreneurial risks and resource preparation.

The IE practice opportunities provided by the school have been well evaluated (with an average of 3.9), which shows that the school has done a relatively full job in providing a practice platform. At the same time, the tutor's support is considered to be sufficient (with an average of 4.0), which is an important help for students in the IE process.

4.2. Medical University Case Study

Taking Baotou Medical College as the case study object, this paper deeply analyzes the concrete measures and their effects in promoting students' IE. In recent years, Baotou Medical College has promoted a number of IE education projects on campus, such as IE workshops, entrepreneurship competitions and school-enterprise cooperation internship projects, which provide a platform for students to practice and learn.

(1) Innovation workshop series

Baotou Medical College holds a series of "innovation workshops" every year to cultivate students' creative thinking ability and improve their practical ability. Through this course, students can have face-to-face communication with industry celebrities and industry authorities, and learn how to combine the theory with practice through real cases. Generally, the theme of the seminar is new medical technology and medical equipment innovation, which provides a platform for students to test their ideas and get immediate feedback.

The results of the series of innovation workshops are shown in Figure 1 (Figure 1(a) shows the skills improvement before and after the innovation workshop, and Figure 1(b) shows the changes of students' entrepreneurial will before and after the innovation workshop).

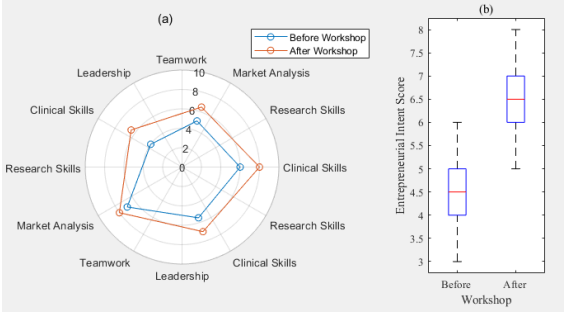

Figure 1: Exploration results of innovation workshop series

After attending the seminar, it can be clearly seen that the students have made progress in all skills, especially the market analysis ability. The improvement of team spirit and leadership ability is equally important, which is a whole for the development of the enterprise and is essential for the whole enterprise.

In the influence of college students before and after participating in the seminar on the score of entrepreneurial intention, the results show that after participating in the workshop, the students' entrepreneurial intention has been significantly improved, and the median and quartile range have increased. It can be seen that this seminar not only improved the skills of the students, but also improved their entrepreneurial interest and self-confidence. This change may be due to the fact that they have gained more knowledge about entrepreneurship and some practical experience at the seminar, and at the same time, they have increased their awareness of their own abilities.

(2) Interdisciplinary entrepreneurship competition

At least once a year, the college invites students from many majors, such as medicine, engineering and business to form a team to jointly carry out entrepreneurial activities in the field of medicine and health. This competition not only pays attention to the commercial value of creativity, but also pays attention to the ability of teamwork and the practicality of the project. In this way, students can learn how to combine their medical knowledge with enterprise strategy in the competition, so as to prepare for future enterprise management.

The score of interdisciplinary entrepreneurship competition is shown in Figure 2.

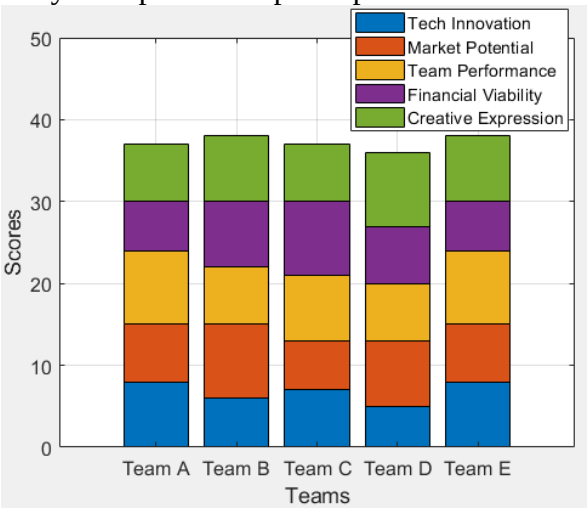

Figure 2: Interdisciplinary Entrepreneurship Competition Score

Group C has a good performance in technological innovation and creative expression, which shows that its projects are very innovative and attractive. However, the market prospects and financial viability of these companies are relatively average. Therefore, despite their great creativity, their market prospects and economic prospects still need to be revised and evaluated.

(3) Business incubator program

In order to support students' entrepreneurial projects with high potential, Baotou Medical College established an entrepreneurial incubator. This incubator not only provides financial support, but also includes office space, legal and financial consulting services. More importantly, the incubator also provides a tutor system. Senior medical industry experts and business leaders will guide students to help them avoid common traps and optimize business models in the process of starting a business.

The scores of the five teams on the four key indicators before and after participating in the incubator project are shown in Table 2.

Table 2: The scores of five teams on four key indicators before and after participating in the incubator project

Team	Metric	Pre-Incubation Score	Post-Incubation Score
Team A	Market Acceptance	4	7
	Technology Development	3	6
	Funding Raised	2	5
	Team Growth	3	6
Team B	Market Acceptance	6	8
	Technology Development	5	7
	Funding Raised	3	6
	Team Growth	5	7
Team C	Market Acceptance	5	7
	Technology Development	4	6
	Funding Raised	3	5
	Team Growth	4	6
Team D	Market Acceptance	6	8
	Technology Development	5	7
	Funding Raised	4	6
	Team Growth	5	7
Team E	Market Acceptance	7	9
	Technology Development	6	8
	Funding Raised	4	7
	Team Growth	6	8

This table shows the specific score changes of each team in each evaluation dimension, and we can clearly see the positive impact of the incubator on each team in technology, market, capital and team growth.

Team A's market acceptance has increased from 4 points to 7 points, which may mean that their products or services have been more widely recognized by the market, which is very important for emerging enterprises.

(4) Social practice and voluntary service projects

The impact scores of social practice and voluntary service projects are shown in Figure 3.

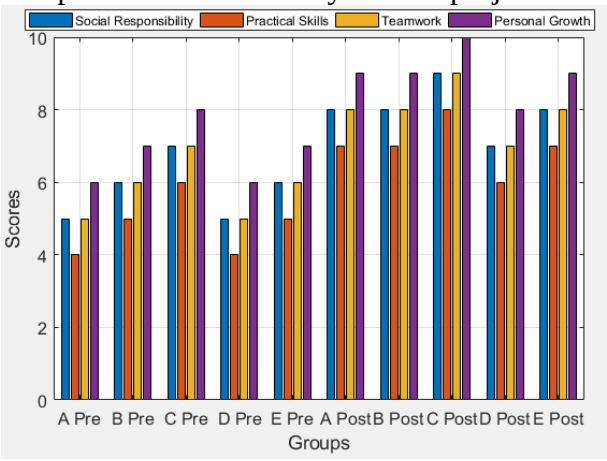

Figure 3: Impact scores of social practice and voluntary service projects

Figure 3 shows the score changes of five student groups on four key indicators before and after participating in social practice and volunteer service projects. The score of each group is divided

into two parts, before and after participation, and each column is subdivided into four aspects: social responsibility, practical ability, teamwork and personal growth.

It can be clearly seen from the figure that all teams have significantly improved in all indicators after participating in the project. For example, Team A's score in social responsibility increased from 5 to 8, practical ability increased from 4 to 7, teamwork increased from 5 to 8, and personal growth increased from 6 to 9.

4.3. Discussion

The case analysis of Baotou Medical College shows that IE education mode, which combines career planning with ideological and political education, has obvious promotion effect on college students' entrepreneurial intention and innovation ability. College students have a strong initiative in entrepreneurial activities and have a deeper understanding of theoretical knowledge in practice. In addition, school counseling and resource connection are also important factors for entrepreneurial success. This has certain reference significance for the development of higher medical universities: strengthening IE education for college students and giving full internship guidance are important ways to improve their entrepreneurial ability. It is also possible to track students' IE performance by adopting longitudinal research design, so as to obtain more in-depth information on the dynamic development process.

Through the above analysis, this paper not only deeply discusses the influencing factors of medical college students' IE ability, but also shows effective educational strategies through specific cases. These findings and inspirations will provide scientific reference for related educational policies and practices in the future.

5. Conclusion

This study mainly discusses the influence of professional courses and ideological and political education in medical universities on students' IE ability under the background of "new medicine". It is found that the interdisciplinary integration and practical orientation of professional courses have significantly improved students' innovative ability. For example, courses involving cutting-edge technologies such as artificial intelligence and genetic engineering enhance students' interdisciplinary thinking and technology application ability. At the same time, practical courses and scientific research projects enable students to improve their problem-solving ability in practical operation.

Although this study has made some achievements in discussing the influence of professional courses and ideological and political education on students' IE ability, it also has some limitations. First of all, the research samples are mainly concentrated in Baotou Medical College, and the sample size and geographical scope are limited, which may affect the universality of the results. Secondly, the data collection of questionnaires and in-depth interviews mainly depends on students' self-reports, and there may be some subjective deviations. Future research should further expand the sample range, covering more medical universities in different regions and levels, so as to enhance the representativeness and universality of the research results. At the same time, a variety of data collection methods can be adopted, such as the evaluation of teachers and business tutors, the tracking of actual entrepreneurial achievements, etc., to improve the objectivity and reliability of data.

Acknowledgement

This work was supported by Inner Mongolia Educational Science Research “14th Five-Year Plan”

Project (NGJGH2023110); Baotou Medical College Research and Development Funds (BYJJ-SZZX 202401).

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