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Article

Exploration and Analysis of Chinese University Students' Performance in Business Innovation

Bo Wang [1], Jun Cui [2,*] and Kannamah Mottan [3]

[1] *Faculty of Education, Language, Psychology & Music, SEGi University, 47810 Petaling Jaya, Malaysia*

[2] *Solbridge International School of Business, 34613 Daejeon, South Korea*

[3] *Faculty of Education, Language, Psychology & Music, SEGi University; 47810 Petaling Jaya, Malaysia*

Abstract: Business Innovation has a broad international reach and a long history. Since the introduction of Business Innovation in China in 1895, the culture of Business Innovation has been widely spread in China. The Business Innovation programmer is also listed as one of the optional business education courses in Chinese higher education institutions (HEIs). In recent years, the Chinese government has continued to deepen business education reform, requiring colleges to include business education in their talent development programmers. Students in business related majors are required to meet the institution's business standards and earn enough business education credits to receive a diploma or bachelor's degree. Since then, there have been significant improvements in the business innovation courtyards, facilities, and faculty of China's higher education institutions. The results indicated that Business innovation teachers in higher education institutions have gradually optimized the content of business innovation courses and the assessment system, which not only develops students' interest in business innovation, but also develops their business innovation skills. In addition, previous studies have shown that appropriate business activities can balance students' academic work to achieve overall development. This paper uses a combination of qualitative and quantitative analysis methods. The findings of this study can help enrich the research on board interlocks and provide insights for international management. help colleges and business innovation teachers to further optimize students' business innovation learning experience, to help students improve their performance, and to seek sustainable development of business innovation education, it is necessary to investigate the factors that affect college students' business innovation performance.

Keywords: Business Innovation program; qualitative and quantitative analysis methods; students' Business Innovation learning experience; Higher Education Institutions (HEIs)

1. Introduction

This study explored the factors influencing the Business Innovation performance of college students when they are grouped according to gender and age in Hunan University of Arts and Science and Hunan University of Science and Technology, which are well-known colleges in Hunan province of China. This study attempted to analyze the factors influencing the Business Innovation performance of college students from the following four perspectives: the level of infrastructure of college Business Innovation, the level of college Business Innovation

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* Corresponding: Jun Cui (jcui228@student.solbridge.ac.kr)

faculty's attainment, the motivation level for college students to strive for excellence in Business Innovation, and the degree of college students' involvement in Business Innovation [1]. This study explored if there is a significant correlation between these factors and college students' performance in Business Innovation.

2. Literature Review

2.1. Research Questions and Variables.

The study intends to answer the following questions:

What is the level of infrastructure of Business Innovation as to:

1) the number of Business Innovation classroom; and

2) the number of Business Innovation equipment?

What is the level of college Business Innovation faculty's attainment in terms of:

1) degree of education;

2) professional qualifications; and

3) publications?

What is the motivation level for college students to strive for excellence in Business Innovation in terms of:

1) the number of positive feedback that the student received from his/her Business Innovation teacher;

2) peer achievement in Business Innovation; and

3) previous exposure to Business Innovation?

What is the degree of college students' involvement in Business Innovation in terms of:

1) students' attendance rate; and

2) hours spent in Business Innovation outside of class?

What is the student respondents' Business Innovation performance in terms of Grade Point Average?

Is there a significant difference in students' Business Innovation performance when students are grouped according to: gender; age; and college where they come from?

Is there a significant relationship between:

The level of infrastructure of school Business Innovation and college students' Business Innovation performance;

college Business Innovation faculty's attainment and college students' Business Innovation performance;

The level of motivation for college students to achieve in Business Innovation class and college students' Business Innovation performance; and

The college students' involvement in Business Innovation and their Business Innovation performance.

Based on findings, what recommendations may be proposed to enhance students' Business Innovation performance or improve the Business Innovation learning environment in Higher Education Institutions of Hunan Province.

3. Materials and Methods

3.1. Hypothesis Development

The Materials and Methods should be described with sufficient details to allow others to replicate and build on the published results. Generally, the following hypotheses were formulated and were tested at 0.05 level of significance:

H1: There is no significant difference in college students' Business Innovation performance between groups of respondents according to gender and age.

H2: There is no significant correlation between the level of infrastructure of college Business Innovation and college students' Business Innovation performance.

H3: There is no significant correlation between the level of college Business Innovation faculty's attainment and college students' Business Innovation performance.

H4: There is no significant correlation between the level of college students' motivation to participate in Business Innovation and college students' Business Innovation performance.

H5: There is no significant correlation between the degree of college students' involvement in Business Innovation and college students' Business Innovation performance.

This study may pose significant benefit to the following stakeholders.

The School Administrators. This study may allow school administration to have a closer look at the relevant data regarding the existing Business Innovation courts and Business Innovation equipment of the college. The school administration may make targeted improvements to the school's Business Innovation facilities to create a better Business Innovation learning environment for students.

College Business Innovation Teachers. This study may provide important information for teachers to improve student performance in Business Innovation classes. Not only may this information be beneficial for teachers to have a clear direction to improve the structure of their curriculum and understand their students' Business Innovation learning, but it may also provide teachers with ideas in promoting student participation in Business Innovation [1].

College Students. This study may provide ideas for students who are learning Business Innovation, including how they could work to improve their Business Innovation scores, information on campus Business Innovation equipment available, and more. For students who would choose a business education elective, this study may inform whether they choose a Business Innovation course.

The Researcher. This study may provide the researcher with a theoretical and practical basis for future research in related fields. In addition, if the researcher would engage in business education teaching activities in the future, the study may provide the researcher with clear ideas for designing teaching content, selecting appropriate teaching methods, and improving student performance.

The Future Researchers. This study may reveal many contemporary issues regarding college student participation and performance in Business Innovation, college Business Innovation faculty, and Business Innovation equipment availability. This research could also provide future researchers with relevant data regarding Business Innovation coverage and development at colleges, which would be a springboard for future scholars to further delve into the relationship between the development of college business education programs and student performance.

Parents. This study may provide parents of current students with first-hand information on the availability of Business Innovation classes of the college, including Business Innovation class hours, faculty strength, students' participation, college business facilities and so on. Parents would have direct access to information about their children's exercise and business performance in college, also have a more comprehensive understanding of study status of students [2].

Business Education Program Developers. This study may effectively provide business education program planners with data about Business Innovation programs, including Business Innovation teachers' qualifications, students' participation and achievement in Business Innovation classes, and so on. Data analysis conducted in this study could equip business education program planners with instructions for optimizing Business Innovation programs [2].

Scope and Limitations of the Study

The samples used in this study came from two universities, namely Hunan University of Arts and Sciences and Hunan University of Science and Technology, which is limited in Hunan Province, China. Thus, the sample data is too small to be representative of all the college in the province or even the country.

3.2. Research Theory and Research Model

The study is based on self-efficacy theory, Walberg's theory of educational productivity and constructivism theory.

3.2.1. Self-Efficacy Theory

Self-efficacy theory (SET) is a sub-concept of Bandura's social cognitive [2,3], which refers to the belief in one's ability to complete a task and achieve the desired outcome. Self-efficacy theory posits that there is an interaction between personal, behavioral, social, and environmental factors.

This theory supports the current study that a person's performance in school is greatly influenced by mastery experiences, vicarious experience, verbal persuasion, and physiological feedback, which are four sources of self-efficacy identified by Bandura (1995). Mastery experiences refer to students' previous experience. Successful performance or experience in Business Innovation increased self-efficacy and confidence to succeed in Business Innovation class. Vicarious experience can be provided by peers. If someone observes a peer successfully completing a task, they may believe that can do it too. Peer success can effectively increase observers' sense of self-efficacy and motivate them to attempt the task. Furthermore, the teacher's encouragement and affirmation can be treated as a positive verbal persuasion, which can foster students' belief in their abilities and lead to high self-efficacy [4]. Physiological feedback refers to a person's ability to manage emotions. Those who feel good about themselves are more likely to build a sense of self-efficacy. Conversely, unsuccessful attempts, negative feedback from teachers and observations of peer failure, and anxiety can lower self-efficacy. Therefore, this study explored the relationship between motivation and performance in Business Innovation learning among college students under self-efficacy theory.

Walberg's Theory of Educational Productivity. Walberg's (1981) Theory of Educational Productivity explored the factors that determined students' performance. As shown in the table below, the theoretical model states that there are nine factors that may affect student achievement. The first seven factors were proposed by Walberg (1981), and peer group factor and mass media factor were supplemented by Fraser et al. (1987). In terms of importance, Walberg (1981) stated that the most important factor affecting students' performance are the classroom climate, followed by student ability and quality of instruction (As shown in Figure 1).

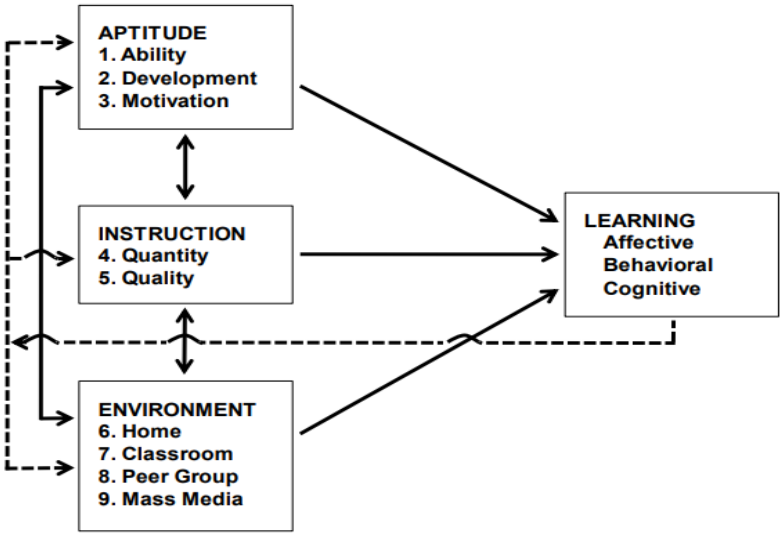

Figure 1. Walberg's Model of Educational Productivity [4] (Source: Author's work).

3.2.2. Constructivism Theory

The term constructivism is used in several domains and has different meanings in each domain. This study is anchored in the constructivist-learning theory proposed by Taber (2006). It is centered on the idea that students play the most crucial role in constructing their knowledge, while the role of teachers and the environment remain important in facilitating the learning process.

Based on the theoretical framework, the level of school Business Innovation infrastructure, the level of education of Business Innovation teachers, students' motivation and student participation are likely to be associated with college Business Innovation performance [5]. This study examines the correlation between these factors and student Business Innovation performance and provide indications on how students can improve their performance in Business Innovation classes.

3.3. Conceptual Framework

Figure 2 is presented to show the significant relationships among the variables. There area four independent variables, three moderating variables and one dependent variable. The dependent variable is college students' performance in Business Innovation. College Business Innovation infrastructure, college Business Innovation faculty's attainment, college students' motivation and college students' involvement are supposed to be independent variables. This study intends to investigate whether there is a significant relationship between the above four independent variables and college students' performance in Business Innovation (As shown in Figure 2).

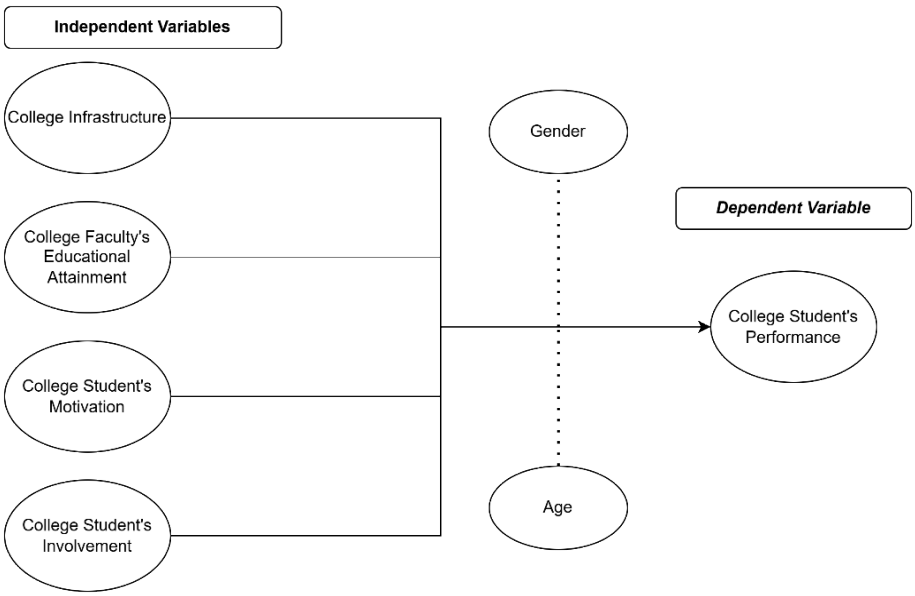

Figure 2. Research Paradigm of "Factors Affecting College Students' Performance in Business Innovation" (Source: Author's work).

This study is quantitative research which uses the multiple linear regression model. Quantitative research [6] is the process of collecting quantitative data, using statistical and mathematical methods to analyze quantitative data, to explain a specific phenomenon. Multiple linear regression [7] is a regression model that used to estimate the relationship between a quantitative dependent variable and more than one independent variables. The main purpose of this study is to examine several factors that influence college students' Business Innovation class performance, including college Business Innovation infrastructure, college Business Innovation faculty's attainment, college students' motivation and college students' involvement, from which Business Innovation faculty's attainment and college students' involvement are external factors and college students' motivation is internal factor. The independent variables that are used in this study are number of Business Innovation classrooms, number of Business Innovation equipment, class size, number of publications by Business Innovation teachers, teacher s' academic qualifications, teachers' professional qualifications, amount of Business Innovation teachers' positive feedback a student received, number of Business Innovation-savvy peers, years of exposure to Business Innovation, students' attendance rates and hours a student spent in Business Innovation outside of class. There are two moderating variables, students' gender and students' age. There was one dummy variable, gender, and two binary variables, faculty with a doctor's degree and faculty with the academic title of "professor." The dependent variable is the students' Business Innovation performance, quantified by Grade-Point Average [8,9].

4. Results

The study is also a correlational study (JMP, 2021) that is used to determine the degree and direction of potential relationship between two variables, if the two variables are related to one another statistically.

In addition, the descriptive research method is used to describe the nature of the nature of the demographic component. This study focus on two groups of respondents, students and teachers, in terms of universities, students' gender, Business Innovation faculty's educational attainment and professional attainment.

4.1. Population and Sample

The researcher used Slovin's formula and random sampling technique to determine the sample size from respondents of Central South University and Hunan University (As shown in Table 1).

Table 1. Distribution of the Respondents of the Study.

School Name	Students		Teachers		Total Respondents
	Total Number	Sample Size	Total Number	Sample Size	
Hunan University of Arts and Sciences	154	130	35	27	157
Hunan University of Science and Technology	191	183	28	21	204
Total	345	313	63	48	361

(Source: Author's work).

4.2. Research Locale

This study was conducted in Hunan University of Arts and Sciences and Hunan University of Science and Technology.

Hunan University of Arts and Sciences

Founded in 1958 and located in Chang De, Hunan Province, China, Hunan University of Arts and Sciences is a full-time public comprehensive institution of higher education. According to the official university website updated in August 2021, the university occupies more than 320 acres of land, has 16 teaching colleges, and offers 65 undergraduate majors [7]. There are more than 1,500 faculty members and staff, and more than 25,500 full-time undergraduate students. The library has a collection of more than 2.4 million paper books and 2.1 million electronic books. The university has complete teaching facilities and training grounds, 15 professional education practice training bases, with a total value of 338 million RMB. A total of nearly 4, 500 business professionals have been trained for the country, and the employment rate of graduates has reached over 93%.

Business Innovation class is also one of the public elective business courses in Hunan University of Arts and Sciences, and it has been continuously innovated and improved. Therefore, students enrolled in Business Innovation classes, Business Innovation teachers and facilities at Hunan Academy of Arts and Sciences are suitable subjects for the study [10].

5. Conclusions

After the project "Factors Affecting College Students' Performance in Business Innovation" was approved by the adviser and the Graduate School officials in JRU Graduate School, the researcher made a questionnaire, conduct field visits to collect relevant data, and apply for permission from the appropriate authorities [5, 11]. Once the request was granted, the survey was conducted at two universities in Hunan Province, China.

The main tool that was used in collecting data was a researcher-made questionnaire. The respondents are business related students from Hunan University of Science and Technology and Hunan University of Arts and Sciences. The researcher randomly selected students and teachers from all respondents in these 2 universities. College students' performances were measured by their Grade Point Average in Business Innovation class, and the level of motivation was measured using questionnaire. Data on the athletic infrastructure of the two universities was obtained from the field visits [12–23].

After collecting the data, the researcher conducted statistical analysis of the data. Based on the analyzed data, conclusions were drawn as well as recommendations to improve student performance.

Statistical Treatment of Data

To interpret the data effectively, the researcher employed the following statistical treatment. Percentage, frequency, mean, composite mean, Ordinary least-squares (OLS) Regression, and F-test was the statistical tools were used to interpret data.

Percentage and Frequency. These were used to determine the profile of the respondents in terms of age and gender. The researcher used this formula:

$$p = \frac{x \cdot 100}{y}$$

Mean and Composite Mean. These were used in the study to determine students' motivation level and students' involvement in Business Innovation. The researcher used this formula in computing the mean:

Mean(X)=XN

Where is:

X=sum of observations

N=number of observations

Ordinary least-squares (OLS) Regression. The OLS Regression was applied to process the data, which is a generalized linear modelling technique that can explain multiple variables. This technique was applied to interpret the relationship between students' performance in Business Innovation and factors affecting students' performance.

The multiple linear regression model's formula is:

y=0+1X1+2X2+⋯+KXK+

Where is.

y= the predicted value of the dependent variable

0=the y-intercept

1X1=the regression coefficient 1 of the first independent variable X1

2X2=the regression coefficient 2 of the first independent variable X2

⋯ = do the same for the number of independent variables to be tested

KXK = the regression coefficient of the last independent variable

ε = the model error reflecting the difference between the observed and fitted linear relationship

F-test Statistics. F test is a test statistic that used to compare the statistical model with respect to the available data set, which was used to test whether the relationship between dependent variables "college students' performance" and independents variables in the study is significant.

F-test was used to test the following null hypothesis and alternative hypothesis:

H0:1=2=⋯=k=0

H1: j≠0, for at least one value of j

The F-test formula is as follows,

F=SSR/KSSE/(n-k-1) =i=1n(yi-y)2/ki=1nyi-y2/(n-k-1) ~F (k, n-k-1)

Where is yi defines the estimated dependent value, n-k-1 defines the degree freedom in a multiple regression. then Also, there is to know if there is significant correlation between the variables, the researcher used 0.05 level of significance.

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Author Contributions

For research articles with several authors, a short paragraph specifying their individual contributions must be

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The authors declare no conflict of interest.

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