The Administration Model for Leaner Quality Development at Guangzhou Panyu Polytechnic in Guangzhou Under Guangdong Province

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Abstract

This research article were: 1) to explore the components and indicators of the administration for learner quality development at Guangzhou Panyu Polytechnic should be, and 2) to propose and verify the administration model for learner quality development at Guangzhou Panyu Polytechnic in Guangzhou under Guangdong Province. Use Mixed methodology design which was comprised of quantitative and qualitative research. The population of the research consisted of 1,000 persons who were administrators, and full-time teachers of Guangzhou Panyu Polytechnic. A proportional stratified random sampling method was used to sample, totaling 286 persons. The instruments used for data collection were semi-structured interview and a five-level rating scale questionnaire. The statistics used for data analysis were descriptive statistics, Exploratory Factor Analysis and Confirmatory Factor Analysis.

The research findings revealed that; 1) There were 8 components and 55 indicators of administration for learner quality development at Guangzhou Panyu Polytechnic should be, which consisted of teacher management, innovation and entrepreneurship management, teaching management, learning management, student management, student employment management, professional construction management, and curriculum construction management, and 2) the administration model of administration for learner quality development at Guangzhou Panyu Polytechnic was fit with the empirical data. The value of Chi-square = 351.192, Degree of Freedom = 342, Goodness of Fit Index = 0.923, Adjust Goodness of Fit = 0.909, Tucker-Lewis Index = 0.998, and Root Mean Square Error of Approximation = 0.010, all in line with specified criteria. In terms of research methods, regression analysis can be further used to study the influence of different independent variables on dependent variables to make the results more accurate and reliable, therefore make the guideline of administration management of Guangzhou Panyu Polytechnic in Guangzhou City,

Guangdong Province, China become the theoretical basis for the practical application of administration management in Guangdong Province and even the whole country.

Keywords: Administration model, Learner quality development, Guangzhou Panyu Polytechnic, Guangdong Province

Introduction

China attaches great importance to the development of the quality of learners. It has successively issued a number of documents and policies at the national level to actively promote the implementation of quality education. General Secretary Xi Jinping, the Chinese leader, pointed out at the 2018 National Education Conference: We must work hard to enhance comprehensive quality, educate and guide students to cultivate comprehensive abilities and cultivate innovative thinking.(Jinping Xi, 2018）As the country moves towards modern industrialization, vocational education has received more and more attention in China, and the importance of vocational education has even been elevated to the status of "without vocational education modernization, there will be no education reform" (Xizhen Zhang, 2019). Vocational education can effectively improve the quality of workers and promote employment, and has specific requirements for the development of learner's quality. There is a certain degree of difference between the learner quality development management of vocational education and other types of education, and the existing research is still insufficient. Based on the development of learner's quality in Guangzhou Panyu Polytechnic, this paper studies the management factors and indicators of the development of learner's quality.

Vocational education has a very important position and role in China's economic construction. In January 2019, the State Council issued the "National Vocational Education Reform Implementation Plan", which clearly stated that "Vocational education and general education are two different types of education and have the same important status", and officially determined that vocational education is a separate type in my country's education system.

As of 2020, there are 11,500 vocational schools nationwide, with 28,571,800 students; secondary vocational enrollment is 6.037 million, accounting for 41.70% of high school education; higher vocational (specialty) enrollment is 4,836,100, accounting for 52.90% of ordinary undergraduates and junior colleges. A total of 54.52 million graduates of higher education and continuing education have been trained, and approximately 320 million people

have been trained in community education. In fields such as modern manufacturing, strategic emerging industries, and modern service industries, more than 70% of new frontline employees come from vocational colleges.（Ministry of education of the people's replublic of china, 2021）

In 2021, the Ministry of Education's "Notice of the Ministry of Education on Studying, Propagating and Implementing the Important Instructions of General Secretary Xi Jinping and the Spirit of the National Vocational Education Conference" proposed "Unswervingly accelerate the improvement of the talent training system. Adhere to the combination of moral and technical training, education and training, Integrate moral education into classroom teaching, skill training, practical training, etc., promote the organic connection between ideological and political courses and curriculum ideological and political, improve the effectiveness of ideological and political education, cultivate students' spirits of labor, work, and craftsmanship, and guide students to study hard , Improve skills and develop in an all-round way."

At present, the competition among countries in the world for talents is actually the cultivation of innovative talents and high-quality talents. However, vocational colleges still lack effective means to cultivate the quality of creative talents. The management concepts of higher education programs that have been in operation for decades in our country still restrict the teaching management of higher education institutions to a large extent. The unified and modular teaching management system hinders the implementation of higher vocational quality education and hinders innovation. Training of talents. Judging from a relatively long period of time in the past, our country has a solid foundation for training college students, but their ability to innovate is weak, which is obviously at a disadvantage in the increasingly fierce international competition. Teaching management innovation is an important content of education innovation. Faced with knowledge and informationization, deepening teaching reform, enhancing the quality of higher education, promoting educational innovation, and cultivating high-quality innovative talents, require higher vocational education and teaching management to improve the scientific level, and require higher vocational education Reform and innovation of the educational and teaching management system.

This researches on the factors and indicators of learner quality development management in Guangzhou Panyu Polytechnic in Guangdong Province, which has very important theoretical and practical significance for further improving the level of school management. The first is to in-depth study the management factors of higher vocational colleges under the

background of quality education, which is conducive to the implementation of quality education in higher vocational colleges; the second is to explore the indicators of management factors of higher vocational colleges, which are conducive to the evaluation of higher vocational colleges. The level of influence of college management on the improvement of the quality of learners; the third is to cause school leaders and administrators of higher vocational colleges to pay attention to new situations and new problems in the implementation of quality education, and to adopt more effective management measures to better adapt. From this point of view, the requirement of quality education to train more high-quality talents has certain practical significance.

Research Objectives

(1) To explore the components and indicators of the administration for learner quality development at Guangzhou Panyu Polytechnic should be?

(2) To propose and verify the administration model for learner quality development at Guangzhou Panyu Polytechnic.

Research Hypotheses

The administration model for learner quality development at Guangzhou Panyu Polytechnic was consistent with the empirical data.

Research Methodology

Phase 1: To explore the components and indicators of the administration for learner quality development at Guangzhou Panyu Polytechnic.

Research Design

In this study, review of important management theory and administration papers about vocational colleges in China, and identify administration factors for learner quality that would be appropriate for vocational colleges. International and Chinese typical literature about the administration and learner quality is studied deeply for understanding different administration factors and learner quality clearly.

Key informants

First of the study was documents that relate to the administration factors including text books, articles research, and research related. The second were 9 key informants or educational experts from Guangzhou Panyu Polytechnic.

Research Instruments

The instruments to collect data, first, collect data from review literature, the main are data record form, and electronic databases from the internet. Second, after the researcher makes a content analysis, has requested 9 experts who screened the administration factors should have. The instrument in this part uses semi-structured interviewing.

Both 2 parts of the instrument will be validity checked and recommended face to face, including development from advisors and instrument experts.

Data Collection

All data gathering by researcher under closely advised from the research committees.

Data Analysis

In terms of the qualitative approach chosen, open coding was initially used to analyse the literature content and to identify themes and categories. Categories or themes were intentionally not pre-established to allow for the possibility that research might suggest further themes. This meant that no codes were developed in advance. After the core themes had been identified, a process called “focused coding” was used to analyses the data in more detail. The process of focused coding entails manually working through the qualitative data line by line, while focusing on the key themes identified during the open-coding process . A process of axial coding allowed for the refinement of themes, followed by the clustering of identified themes in specific categories and subcategories. Next, the higher-order categories and subcategories were used as a framework to compile the questionnaire used to capture the respondents’ perceptions of the importance of the identified administration factors. The responses of the respondents then ranked using quantitative procedures.

Phase 2: To propose the administration model for learner quality development at Guangzhou Panyu Polytechnic.

Research Design

A quantitative research approach will be used, and an exploratory research (descriptive research) design will be employed.

Population and Sample

The population in this phase is a school director, an assistant director, senior teachers and staff within 14 departments (colleges) of Guangzhou Panyu Polytechnic during the academic year of 2023, total 1000 persons. We used stratified random sampling technique to select the respondents, total 286 persons (department representative), which is suitable under the formula of Taro Yamane (1973), an error of 5%.

After calculating the sample size by substituting the numbers into the Yamane formula, the numbers of the sample are for 285.7143 persons. In order to obtain reliable data, the researcher increased the sample size to 286 persons.

Research Instruments

A questionnaire incorporating all the administration factors identified in the literature review and screened by experts will be developed. The list of administrative factors was structured, and the respondents will request to rate the administration factors in terms of importance their indicators should have. It consists of 2 parts are: part 1 is the questionnaire to ask demographic variables of the respondents is in the form of checklist such as gender, age, education level, position, year of work experience etc.

Part 2 is the rating scale questionnaire to ask about the administration factors that important indicators should have.

Data Collection

The steps for data collection will be as follows:

Step 1: Request permission to collect data for research at the Guangzhou Panyu Polytechnic.

Step 2: Request a letter of recommendation for the researcher from the Guangzhou Panyu Polytechnic.

Step 3: Selection of the coordinating teachers to help assist in coordinating data collection in each institution. Those will be oriented to understand the details of the questionnaire administration and data collection.

Step 4: Carry out data collection with the selected samples by sending questionnaires to the coordinator teacher who will help collect data with the selected samples in each school/college/department.

Data Analysis

Data analysis and statistics used in the research are as follows:

1. Analysis of the status of the respondents in terms of gender, age, educational background and work experience in the current position by using a software packaged program, descriptive statistics used such as frequency, and percentage.

2. The analysis of the perception level of the respondents using a scale was estimated at 5 levels using the mean and the standard deviation. Whether the mean of the respondent's questionnaire scores fell within any behavioral range was shown that the characteristics of the practice that meet the actual conditions are like that by using the opinion evaluation criteria according to Best' analysis concept of average stratification which divided into 5 levels as follows: (Best, John W. & Kahn, James V. (1998).)

3. Factor Analysis by examining the Optimization of the correlation matrix between the 55 indicators for the statistical value to be considered according to Hair et al. (2006) that is, the Bartlett's Test of Sphericity value must be significant. indicates that the overall variables were only related enough to analyze the next component, together with the consideration of KMO (Kaiser-Meyer-Olkin Measure of Sampling Adequacy), which is an indication of the suitability of the data. should be greater than 0.50. Then using Exploratory Factor Analysis (EFA) by Principal Component Analysis (PCA) and Orthogonal Rotation as well. Varimax method by considering the eigenvalue according to the criteria that the component must have an eigenvalue greater than or equal to 1. There are indicators that describe components of 3 or more indicators. And the indicator in each component must have a factor loading value of 0.45 or more. Therefore, researcher was selected the highest weight for that component (Hair et al, 2006) and then requests the component from several common indicators that together measure in each component.

4. Confirmatory Factor Analysis by testing the conformity of the structural correlation model and weighting the sub variables used to generate the empirical data indicators obtained from the weighted analysis of the data from the questionnaire. The sub-variables used to generate the indicators and to verify the coherence of the research model are the theoretical models created by the researcher analysing first Order and According order confirmation component with the empirical data. Thereafter, the coherence of the research model with the empirical data was examined. If the results of the first data analysis do not meet the specified criteria, the researcher must adjust the model to meet the specified criteria. According to the viewpoint of Diamantopoulos & Siguaw, 2000; Schumacker & Lomax, 2010; Jöreskog &

Sörbom, 2012; Kelloway, 2015; Hair, et al, 2019; Pulpong Sooksawang, 2021), the statistical values to be used as the audit criteria are as follows:

(1) Chi-square Statistics is a statistical value used to test the statistical hypothesis that the function Harmony is zero. The lower the Chi-square Statistics, the closer to zero the model is consistent with the empirical data.

(2) Harmony Level Index (Goodness-of- Fit Index: GFI), which is the ratio of the difference between the harmonious functions from the model before and after the model was adjusted to the harmonization functions before the model was adjusted GFI values from 0.90-1.00 indicate that the model was consistent with the empirical data.

(3) Adjusted Goodness-of-Fit Index (AGFI), in which the GFI is adjusted taking into account the size of freedom (df), which includes the number of variables and the sample size if the AGFI values from 0.90-1.00 indicate that the model is consistent with the empirical data.

(4) Root Mean Square Error of Approximation (RMSEA) error indicates the dissonance of the model generated with the population covariance matrix which is A value of RMSEA less than 0.05 indicates that the model is consistent with the empirical data.

(5) Apply the results of the analysis to verify the consistency of the model. The following criteria were selected for indicators showing Factor Loading: 1) equal to or greater than 0.7 for parent component (Farrell & Rudd, 2011), and 2) equal to or greater than 0.30 for sub-element and identifier (Tacq, 1997).

Research Results

The research procedures consisted of three steps:

Section 1: Content Analysis of the components and indicators of the administration for the learner quality development from related literature, related research, and key informant interview. It was qualitative research. The researcher has studied of review of literature, related research, interviews with qualified experts, there were many points of consistency. The researchers then integrated it and created the Index of Item-Objective Congruence (IOC) of the research instrument. It was found that the conformity index of 0.60 or higher was obtained and the qualified person proposed to revise some questions were excluded from the study after being tested with a sample from the education management commission. Finally, there were 55 variables obtained from review of literature and relevant research. The validity of these variables was confirmed by interviews with qualified experts.

Section 2: Determine the components and indicators of Administration for the learner quality development at Guangzhou Panyu Polytechnic in Guangzhou through Exploratory Factor Analysis (EFA). It was quantitative research. The researcher used the EFA: Exploratory Factor Analysis in order to explore the components and indicators of the administration for learner quality development at Guangzhou Panyu Polytechnic should be? It can show that there were 8 components and indicators as follows:

Component 1: Student management, consisted of 8 indicators.

Component 2: Teacher management, consisted of 8 indicators.

Component 3: Learning management, consisted of 8 indicators.

Component 4: Curriculum construction management, consisted of 7 indicators.

Component 5: Professional construction management, consisted of 7 indicators.

Component 6: Teaching management, consisted of 7 indicators.

Component 7: Student employment management, consisted of 5 indicators.

Component 8: Innovation and Entrepreneurship management, consisted of 5 indicators.

Section 3: Propose and verify the administration model for learner quality development at Guangzhou Panyu Polytechnic in Guangzhou under Guangdong Province. It was quantitative research. The researcher used the components and variables of leaner quality development required by administrators from step (1) Select the indicators that appropriate for the measurement model of each component within 8 components by consider the fit index criteria with the empirical data and the factor loading, step (2) Examine the relationship between the components, and convergent validity both CR. value (Composite Reliability of the measurement model and A.V.E. value (Average Varience Extraction). Because of the CFA, the measurement model has to the independent each other, and the variable in the model has to valid and reliability as well as the instrument validity and reliability, and step (3) Propose the First Order and Second Order CFA of administration model for learner quality development at Guangzhou Panyu Polytechnic in Guangzhou. These model were consisted of measurement model 1: Student management, it is consisted of 4 indicators were V23, V24, V27, and V30; measurement model 2: Teacher management, it is consisted of 3 indicators were V15, V16, and V21; measurement model 3: Learning management, it is consisted of 4 indicators were V3, V6, V8 and V9; measurement model 4: Curriculum construction management, it is consisted of 4 indicators were V8, V9, V10, and V11; measurement model 5 : Professional construction management, it is consisted of 4 indicators were V1, V3, V4, and V5; measurement model 6:

Teaching management, it is consisted of 3 indicators were V36, V37, and V41; measurement model 7 : Student employment management, it is consisted of 3 indicators were V31, V32, and V34; measurement model 8: Innovation and Entrepreneurship management, it is consisted of 3 indicators were V51, V52, and V53. The diagram of model as showed in Figure 1 and 2.

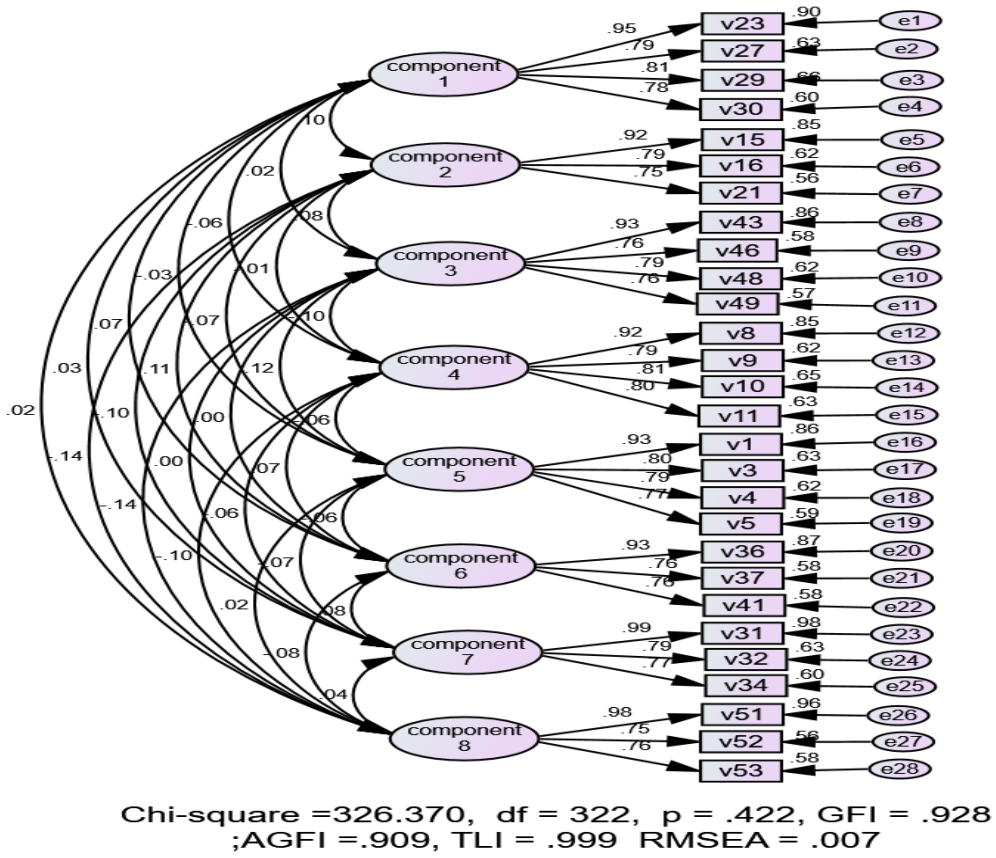

Figure 1 First order CFA of administration model for learner quality development at Guangzhou Panyu Polytechnic

Figure 1, was showed the first Order CFA of administration model for learner quality development at Guangzhou Panyu Polytechnic which fit with the empirical data, because of the value of Chi-square = 326.370, df = 322, p = 0.422, GFI = 0.928, AGFI = 0.909, TLI 0.999, and RMSEA = 0.007, By this evaluate index meet the specified criteria Relative Chi-square < 0.2, p > 0.05, GFI, TLI, AGFI ≥ 0.95 and RMSEA ≤ 0.05.

These value accordance with the fit ndex criteria as show in Table 1.

Table 1 The results of data analysis from the index used to examine the consistency and harmony of the variables with the empirical data. (Final adjustment)

Value	Standard	First value before adjustment	Result
x^2	P > 0.05	x^2=326.37, p=0.422	accept
GFI	0.90<GFI≤ 1.00	0.928	accept
AGFI	0.90≤AGFI≤ 1.00	0.909	accept
RMSEA	0.00≤RMSEA≤0.08	0.007	accept
CFI	0.95≤CFI≤1.00	0.990	accept
TLI	0,90≤TLI≤1.00	0.999	accept
Standardized RMR	<0.05	0.035	accept

Note: Index to determine the CFA model fit with the empirical data were cited from various reference such as: Diamantopoulos & Siguaw, 2000; Schumacker & Lomax, 2010; Jöreskog & Sörbom, 2012; Kelloway, 2015; Hair, et al, 2019; Pulpong Sooksawang, 2021).

Table 2 Show statistical value of administration model for learner quality development at Guangzhou Panyu Polytechnic

	Latent and observable	Standardized Factor loading	S.E.	C.R.	P	R^2
Administration Model for learner quality development at Guangzhou Panyu Polytechnic, in Guangzhou City	1: Student management 0.120 (5)					
	V23	.947	-	-	-	0.897
	V27	.793	.045	18.021	***	0.629
	V29	.810	.045	18.721	***	0.655
	V30	.778	.049	17.377	***	0.605
	2: Teacher management 0.480 (1)					
	V15	.921	-	-	-	0.849
	V16	.790	.063	14.41	***	0.624
	V21	.746	.060	13.620	***	0.556
	3: Learning management 0.190 (4)					
	V43	.925	-	-	-	0.856
	V46	.764	.053	15.833	***	0.584
	V48	.786	.052	16.553	***	0.618
	V49	.756	.053	15.587	***	0.572
	4: Curriculum construction management 0.050 (8)					
	V8	.920	-	-	-	0.846
	V9	.785	.049	16.879	***	0.617
	V10	.808	.050	17.710	***	0.653

V11	.796	.046	17.278	***	0.634
5: Professional construction management			0.060 (7)		
V1	.928	-	-	-	0.861
V3	.796	.048	17.264	***	0.633
V4	.786	.048	16.926	***	0.618
V5	.767	.041	16.239	***	0.588
6: Teaching management			0.210 (3)		
V36	.932	-	-	-	0.869
V37	.758	.048	13.784	***	0.575
V41	.765	.047	13.900	***	0.585
7: Student employment management			0.110 (6)		
V31	.991	-	-	-	0.982
V32	.791	.044	16.741	***	0.626
V34	.773	.042	16.164	***	0.598
8: Innovation and Entrepreneurship management			0.330 (2)		
V51	.982	-	-	-	0.964
V52	.749	.042	14.450	***	0.561
V53	.764	.045	14.833	***	0.584

Therefore, it can be concluded that the Administrator' s resilient leadership that have 7 components, there are (1) professional construction management, (2) curriculum construction management, (3) teacher management, (4) student management, (5) student employment management, (6) teaching management, (7) learning management, and (8) innovation and entrepreneurship management. In conclusion the administration model for learner quality development at Guangzhou Panyu Polytechnic in Guangzhou under Guangdong Province as showed in Figure 2:

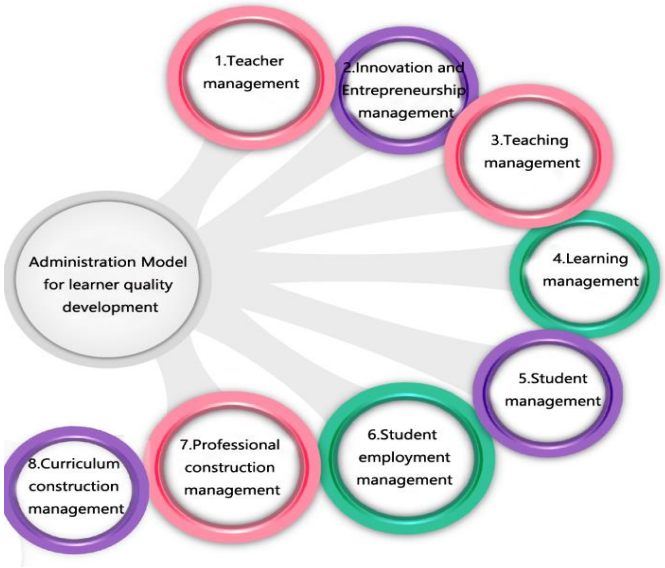

Figure 2 Shows the Administration Model for learner Quality Development at the Guangzhou Panyu Polytechnic in Guangzhou City

Discussion

1 Discussion about major findings of objective 1

Based on research objective 1, the discussion was presented as follows: Literature reviews, related research, and interviews with qualified experts served as a preliminary research source of information for developing the instrument. This research initially content examines 55 components associated with student quality in vocational colleges. Through Exploratory Factor Analysis （EFA）, a questionnaire about the factors of administration that require development for improving learner quality at Guangzhou Panyu Polytechnic, totaling 55 items. There were 8 components of the factors of administration that require development for improving learner quality at Guangzhou Panyu Polytechnic which were consisted of professional construction management, Curriculum construction management, teacher management, student management, student employment management, teaching management, learning management, innovation and , entrepreneurship management. The major findings were revealed as such for the following reasons.

2 Discussion about major findings of objective 2

Based on the research objectives 2, the discussion was presented as follows: Through Confirmatory factor analysis (CFA), For Factor 1（professional construction management）, the AVE square root value is 0.788, which is larger than the maximum value of the absolute value of the correlation coefficient between factors, 0.094, indicating that it has

good discriminant validity. For Factor 2（curriculum construction management）, its AVE square root value is 0.804, which is larger than the maximum value of the absolute value of the correlation coefficient between factors, 0.076, indicating that it has good discriminant validity. For Factor 3（teacher management）, its AVE square root value is 0.772, which is larger than 0.155, the maximum value of the absolute value of the correlation coefficient between factors, indicating that it has good discriminant validity. For Factor 4（student management）, its AVE square root value is 0.800, which is larger than the maximum value of the absolute value of the correlation coefficient between factors, 0.078, indicating that it has good discriminant validity. For Factor 5（student employment management）, its AVE square root value is 0.830, which is larger than the maximum value of the absolute value of the correlation coefficient between factors, 0.081, indicating that it has good discriminant validity. For Factor 6（teaching management）, its AVE square root value is 0.775, which is larger than the maximum value of the absolute value of the correlation coefficient between factors, 0.080, indicating that it has good discriminant validity. For Factor 7（learning management）, its AVE square root value is 0.768, which is larger than 0.153, the maximum value of the absolute value of the correlation coefficient between factors, indicating that it has good discriminant validity. For Factor 8（innovation and entrepreneurship management）, its AVE square root value is 0.809, which is larger than 0.155, the maximum value of the absolute value of the correlation coefficient between factors, indicating that it has good discriminant validity.

Model fitting index was used to analyze the validity of the overall model fitting. First, there are many indicators of model fitting, and it is usually difficult for all indicators to reach the standard. Second, it is recommended to use several common indicators, including chi-square degree of freedom ratio, CFI, TLI, RMSEA, SRMR.

The above values of the model fitting index are above the standard values, indicating that the model fitting is better.

In addition from discussion above , researcher could propose about 8 implementation guidelines for the learner quality development at Guangzhou Panyu Polytechnic.

Recommendations

1 Recommendation for Practical Application

Recommendation for practical application of administration management of the Guangzhou Panyu Polytechnic in Guangzhou City Guangdong Province, China.

According to the research results of this paper and the characteristics of education input, process, and output of education , Guangzhou Panyu Polytechnic in Guangzhou City Guangdong Province, China administration management practical application was as 8 components: (1) professional construction management, (2) curriculum construction management, (3) teacher management, (4) student management, (5) student employment management, (6) teaching management, (7) learning management, and (8) innovation and entrepreneurship management.

2 Recommendation for Further Research

1) Future research will make further questionnaire survey on the basis of this study, expand the sample quantity and improve the data quality.

2) In focus group discussion, offline discussion can be realized and more new ideas can be obtained. Further improve the administration management of Guangzhou Panyu Polytechnic in Guangzhou City, Guangdong Province.

3) In terms of research methods, regression analysis can be further used to study the influence of different independent variables on dependent variables to make the results more accurate and reliable, therefore make the guideline of administration management of Guangzhou Panyu Polytechnic in Guangzhou City, Guangdong Province, China become the theoretical basis for the practical application of administration management in Guangdong Province and even the whole country.

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