The Moderating and Mediating Effects of Art Major and Learning Enthusiasm on the Relationship Between Administration Factors and Teaching Quality : A Case Study of Guangzhou Academy of Fine Arts, Guangdong Province

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Abstracts

There are many papers on research of administuation factors and teaching quality about colleges and universities in the world, but there is not enough attention to art colleges and universities. Therefore, exploring how administuation factors affect the teaching quality in art colleges and universities is currently needed.

The objectives of this study were to: 1) prove that administration factors positively affect teaching quality. 2) prove that administration factors positively affect learning enthusiasm. 3) prove that learning enthusiasm positively affect administration factors. 4) prove that administration factors positively affect teaching quality via learning enthusiasm. 5) prove that the relation model of administration factors on teaching quality different between groups of majors in GAFAU.

Population in this study were students in GAFAU in the academic year 2021. Sample were selected from population by using stratified sampling method. This study used a data questionnaire survey method for data collection, and 458 valid questionnaires were collected. The study used descriptive statistics and structural equation model (SEM), and data analysis was conducted using software such as SPSS, Amos and Jamovi.

The research results showed that: Hypothesis1 was valid. Administration factors had positive effect on teaching quality; Hypothesis2 was valid. Administration factors had positive effect on learning enthusiasm; Hypothesis3 was valid. Learning enthusiasm had positive effect on teaching quality; Hypothesis4 was valid. Administration factors had indirect effect on teaching quality through learning enthusiasm; Hypothesis5 was invalid. The relationship models of administration factors affecting teaching quality in GAFAU had no difference between majors.

Keywords: Guangzhou Academic of Fine arts; Guangdong Province; Administration Factors; Teaching Quality; Learning Enthusiasm.

Introduction

China's university education has developed rapidly in the past three decades, while Guangdong Province, as the most important province in China's economy, is relatively weak in higher education. From the list of "double first-class" universities and the list of "double first-class" disciplines published by the Ministry of education in September 2017, it can be seen that among the 137 shortlisted universities, only 5 universities in Guangdong Province rank eighth among all provinces (including municipalities directly under the central government) in

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China. (Ministry of Education of The People's Republic of China, : Online 2017.) Therefore, the government departments of Guangdong Province have also issued strategies to revitalize higher education, especially in terms of university budget, so as to improve the overall teaching quality of universities in Guangdong Province. Under the background of strong financial support from the Guangdong provincial government, how to seize the development opportunity, how to improve the teaching quality through administrative management, and how to cultivate excellent students to improve the college quality will be the common problems faced by all colleges and universities.

From the development history over the past 70 years, GAFAU has developed from a college to an undergraduate college, and from a master's degree authorization point to a doctor's degree authorization point. With the development trend of China's education, its teaching quality has been greatly improved, and its school scale has gradually expanded. However, in the current situation of complex development of colleges and universities, can GAFAU give better play to its professional advantages and cultivate more and better talents. These problems are not only related to the teaching quality of the college itself, but also related to the employment and development prospects of the students it trains. Therefore, GAFAU's leadership attaches special importance to its quality. However, from the perspective of teaching quality, it seems that we should pay more attention to how to train students. Can GAFAU graduates match their talent training objectives? How satisfied are students with the school? Do they agree with the current teaching achievements and resources of the school? As the object of education, GAFAU students should be more objective in evaluation than others. Therefore, this study will take all students of GAFAU in 2021 academic year as the research population to conduct an in-depth study on the relationship between administrative factors and teaching quality.

Research Hypothesis

1 Hypothesis H1: Administration factors have positive effect on teaching quality.

2 Hypothesis H2: Administration factors have positive effect on learning enthusiasm.

3 Hypothesis H3: Learning enthusiasm has positive effect on teaching quality.

4 Hypothesis H4: Administration factors have indirect effect on teaching quality via learning enthusiasm.

5 Hypothesis H5: The relationship models of administration factors affecting teaching quality in Guangzhou Academy of Fine Arts in are different between majors.

Scope of Content to Study

Researcher obtained the following research content by consulting literature and combining with the specific administrative and teaching situations of Guangzhou Academy of Fine Arts. 1) Teaching' quality. 2) Student satisfaction. 3) Teaching achievement. 4) Teaching environment and equipment. 5) Administration factors. 6) Curriculum. 7) Teaching resources and funding. 8) Student teacher ratio. 9) School goals. 10) Enrollment management. 11) Construction of teachers. 12) Learning enthusiasm. 13) Teachers' teaching ability. 14) Learning objectives. 15) Learning confidence.

Population and Sample

Population in this study will be fine art students in GAFAU which compose of 2 majors namely Fine arts and Design from Grade1 to Grade4 according to the academic year 2021. The number of total populations is 5399 students, 2181 in Fine arts and 3218 in Design.

Table 1 Number of population and simples calculated by majors

Grade	Population of Fine Arts	Population of Design	Sample of Fine arts	Sample of Design
Grade 1	589	877	39	58
Grade 2	606	991	40	66
Grade 3	508	709	34	47
Grade 4	478	641	32	43
sum	2181	3218	145	214
Total	5399		359	

In order to ensure the rationality of the sample size, the researcher used G-Power software to calculate the total sample size which was 359 and obtained the following separate sample results: the sum of Fine arts major was 145, of which the sample sizes of grades 1 to 4 are 39, 40, 34 and 32 respectively; The sum of Design major was 214, of which the sample sizes of grades 1 to 4 are 58, 66, 47 and 43 respectively.

The Creation of Research Instruments

Step 1 Study information

The main task of this step was to collect information related to survey information. Including research methods, research theories and research data. The research method was mainly to use the international research methods related to this study for reference to carry out research and investigation. The research theory mainly included the existing research results of GAFAU administrative factors and teaching quality.

Step2 Drafting questionnaire

The second step was the draft of the questionnaire, which was divided into two parts. The first part was basic information, including gender, major, grade, family, provincial source and other information. The second part was the questionnaire involving administration factors, teaching quality and learning enthusiasm. The main content of the questionnaire was as follows:

Questionnaire 1: How do administration factors affect teaching quality?

Questionnaire 2: How do administration factors affect learning enthusiasm?

Questionnaire 3: How does learning enthusiasm affect teaching quality?

Questionnaire 4: How do administration factors affect teachers' teaching ability, students’ learning objectives and learning confidence?

Questionnaire 5: How do administration factors affect satisfaction, teaching achievement and teaching environment and equipment?

Questionnaire 6: How does learning enthusiasm affect satisfaction, teaching achievement and teaching environment and equipment?

Questionnaire 7: How do administration factors indirectly affect teaching quality through students' learning enthusiasm?

Step3 Content validation (IOC)

In this step,. Researcher invited 5 experts to test and rate the above questionnaires. In the rating measurement table, each sentence had three options "-1", "0", and "+1". For ewample, expert choosed "-1", which meaned he absolutely did not agree with this sentence. If expert choosed "0", which meaned he was not sure whether this sentence is accurate. At the end researcher analysed the reliability of the questionnaires and ensured the quality of each issue.

Research Methodology

This study utilizes statistical principles such as CFA, SEM, Moderation, Mediation, and Measurement model variance, and conducts research and statistical analysis on the content using software such as Amos and Jamovi.

1) This study will use the theory of CFA to construct the model and analyze data. The CFA model can be operated through software such as Amos and Jamovi. Under the premise of ensuring the same model and data operation, the indicator analysis results of the two software are basically consistent.

2) Researcher will construct SEM model. In the framework of this study, as the Administration factor is considered the only independent variable, it is an independent and unique variable without adding variance. Learning enthusiasm and teaching quality are considered dependent variables, therefore, these two variables are dependent variables and variance needs to be added. Researchers will use a single arrow to represent the influence path of variables in the SEM model drawn using Amos

3) This study will use modeling testing of moderation which is identical with the process of performing a two group analysis. The variable 'Major' in this study belongs to a categorical moderator, which can reflect the different effects of administrative factors on teaching quality in two majors. To test this moderator, researcher will use an identical path model in AMOS and establish a two group analysis.

4) Mediation refers to how the influence between two structures in a structural equation model is indirectly transmitted through a third variable. (Collier, 2020) This study inserts an intermediary "learning enthusiasm" into the path where administrative factors directly affect teaching quality.

5) Measurement model invariance refers to the presence of two different groups in a study, and researchers need to use the same measurement criteria for each group. In these cases, measurement model invariance testing is usually required. This test is conducted to determine whether the factor load of the indicators in CFA does not differ between groups. There are two groups in this study, Fine Arts and Design, as they represent survey reports from students in two different majors. Therefore, researchers need to ensure that the meaning of the indicators has not changed.

Data analysis

The following softwares will be used for data management and analysis: 1) G-Power software will be used to calculate the number of samples. 2) SPSS software will be applied to statistics and analysis of variable data. 3) Amos software will be used to draw measurement models and structural equation models, and analyze the reliability of potential variables. 4)

Jamovi software will be used to analyze the statistical indicators of each factor and observation variable.

Descriptive statistics will be used to classify and recognize the basic properties of samples. In addition, percentages and standard deviations will be used for data analysis.

In inferential statistics, Chi-square test will be used to test the fitting degree of CFA and SEM models. In addition, this study will also use other instruments to test their rationality, such as SRMR, RMSEA, CMIN, df, CFI, etc. The z-test will be used to measure the five hypotheses of this study. The method of filling instructions will be applied in the analysis conceptual framework model.

Research Research Framework

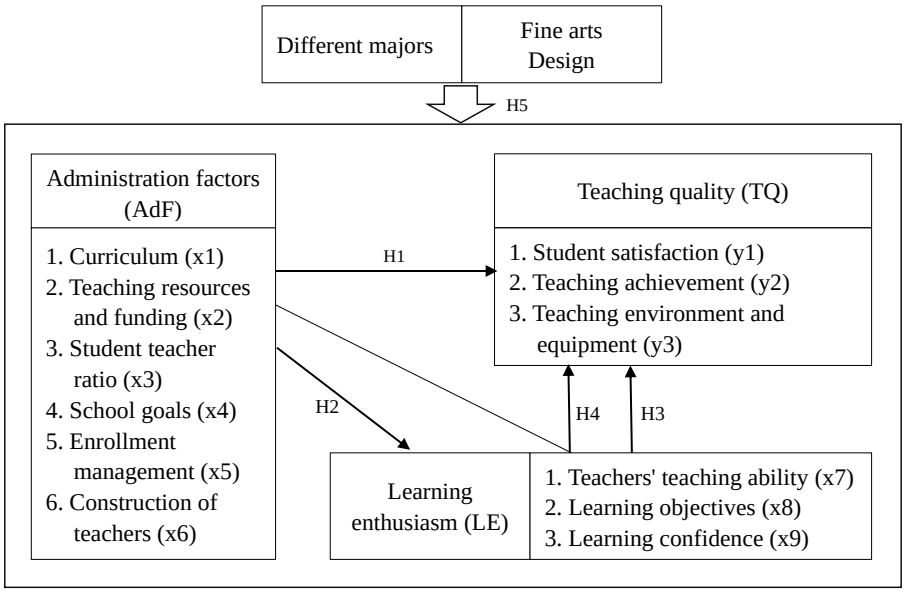

Figure 1. The research framework

Figure 1.1 shows the research framework of this study. Administration factors, Teaching quality, and Learning enthusiasm are latent variables, each with several observational variables. H1 represents the direct impact of administration factors on teaching quality. H2 represents the direct impact of administration factors on learning enthusiasm. H3 represents the direct impact of learning enthusiasm on teaching quality. H4 represents the indirect impact of administration factors on teaching quality through learning enthusiasm. H5 represents different relationship models between different majors.

Research Results

1) Statistics for demographic data

Table 2. Frequencies percent and cumulative percent of demographic data

Frequency	Percent	Valid Percent	Cumulative Percent	Cumulative Percent
		Sex		
1 Male	99	21.62	21.62	21.62
2 Female	359	78.38	78.38	100.00
		Major		
1 Fine arts	259	56.55	56.55	56.55
2 Design	199	43.45	43.45	100.00
		Grade		
1 Grade1	174	37.99	37.99	37.99
2 Grade2	93	20.31	20.31	58.30
3 Grade3	92	20.09	20.09	78.38
4 Grade4	99	21.62	21.62	100.00
		Family		
1 City	255	55.68	55.68	55.68
2 Town	128	27.95	27.95	83.62
3 Countryside	75	16.38	16.38	100.00
		Province		
1 Guangdong pro'	354	77.29	77.29	77.29
2 Other provinces	104	22.71	22.71	100.00
Total	458	100.00	100.00	

Table 2 showed that there was a total of 458 valid sample sizes in this data, and these sample sizes were classified and counted according to the five attributes of gender, major, grade, family and province. In terms of major statistics, 259 (56.6%) students came from Fine Arts, while 199 (43.4%) students come from Design. At present, the total number of students in the two majors of GAFAU was basically the same, and this data also conformed to this situation.

2) Descriptive statistics for observe variables

Table 3. The statistical description of observed variables in one group

ObV	n	$\bar{x}$	s.d.	Skew	se	Kurtosis	se	Leble
x1	458	3.90	0.730	-0.601	0.114	1.227	0.228	good
x2	458	4.04	0.786	-0.819	0.114	0.988	0.228	acceptable
x3	458	3.82	0.795	-0.341	0.114	0.182	0.228	excellent
x4	458	3.76	0.793	-0.319	0.114	0.180	0.228	excellent
x5	458	3.88	0.784	-0.442	0.114	0.239	0.228	good
x6	458	4.13	0.753	-0.815	0.114	0.931	0.228	acceptable
x7	458	3.76	0.796	-0.551	0.114	0.867	0.228	good
x8	458	3.68	0.766	-0.416	0.114	0.837	0.228	good
x9	458	3.75	0.731	-0.429	0.114	0.700	0.228	good
y1	458	3.97	0.763	-0.613	0.114	0.641	0.228	good
y2	458	3.88	0.746	-0.388	0.114	0.472	0.228	excellent
y3	458	3.85	0.785	-0.469	0.114	0.425	0.228	good

Data analysis in the Table 3 show that sample size were 458 students. The mean value ($\bar{x}$) of the observed variables were between 3.68 and 4.13, with two variables at the "strong agree" criteria and ten at the "agree" criteria. The standard dispersions of them ranged from 0.73 to 0.796 and were between 0 and 1. Their ranges of skewness were between -0.819 and -0.319, all of which were less than 2 and greater than - 2, indicating that they meet statistical requirements. In addition, the kurtosis of these observed variables ranged from 0.18 to 1.227, and they were both greater than - 10 and less than 10. Therefore, the peak value also meets statistical quality standards. In addition, researcher divided the quality of skewness into three levels, with values ranging from 0 to 0.4 indicating “excellent”, values ranging from 0.4 to 0.7 indicating “good”, and values ranging from 0.7 to 0.9 indicating “acceptable”. We can see that three indicators were “excellent”, seven indicators were “good”, and two indicators were “acceptable”. In summary, observation variables in this study have a normal distribution and can be used in the CFA model.

Table 4. Inter correlation matrix (Cont.)

	x1	x2	x3	x4	x5	x6	x7	x8	x9	y1	y2	y3
x1	1.000											
x2	0.741 ***	1.000										
x3	0.631 ***	0.641 ***	1.000									
x4	0.551 ***	0.510 ***	0.582 ***	1.000								
x5	0.590 ***	0.565 ***	0.590 ***	0.678 ***	1.000							
x6	0.705 ***	0.671 ***	0.600 ***	0.621 ***	0.643 ***	1.000						
x7	0.406 ***	0.431 ***	0.396 ***	0.543 ***	0.527 ***	0.511 ***	1.000					
x8	0.399 ***	0.387 ***	0.371 ***	0.539 ***	0.487 ***	0.460 ***	0.718 ***	1.000				
x9	0.468 ***	0.416 ***	0.409 ***	0.521 ***	0.497 ***	0.516 ***	0.673 ***	0.821 ***	1.000			
y1	0.494 ***	0.548 ***	0.434 ***	0.475 ***	0.483 ***	0.537 ***	0.562 ***	0.560 ***	0.588 ***	1.000		
y2	0.422 ***	0.452 ***	0.408 ***	0.473 ***	0.454 ***	0.445 ***	0.636 ***	0.687 ***	0.715 ***	0.712 ***	1.000	
y3	0.428 ***	0.467 ***	0.393 ***	0.528 ***	0.479 ***	0.453 ***	0.639 ***	0.669 ***	0.662 ***	0.674 ***	0.784 ***	1.000

Note: ***represents $p < 0.001$

Table 4 showed the Pearson’s correlation matrix between observed variables. In data analysis, the researcher reviewed the value ranged from 0.387 to 0.821, and all of them were statistically significant with p-value, with p-value less than 0.001. These observe variables could be good indicators to measure the latent variables in the study.

3) Measurement Model

Table 5. The factor roading of Measurement Model in one group

		95% Confidence Intervals						
LtV	ObV	λ	se	Lower	Upper	λ	z	p
AdF	x1	1.000	0.0000	1.000	1.00	0.802		
	x2	0.970	0.0443	0.883	1.06	0.778	21.9	< .001
	x3	0.944	0.0546	0.837	1.05	0.757	17.3	< .001
	x4	0.919	0.0553	0.811	1.03	0.737	16.6	< .001
	x5	0.952	0.0548	0.845	1.06	0.764	17.4	< .001
	x6	1.050	0.0533	0.946	1.15	0.842	19.7	< .001
LE	x7	1.000	0.0000	1.000	1.00	0.832		
	x8	1.057	0.0488	0.961	1.15	0.879	21.6	< .001
	x9	1.112	0.0525	1.009	1.22	0.925	21.2	< .001
TQ	y1	1.000	0.0000	1.000	1.00	0.787		
	y2	1.146	0.0532	1.042	1.25	0.902	21.5	< .001
	y3	1.101	0.0535	0.996	1.21	0.867	20.6	< .001

As showed in Table 4.4, the observe variables' factor loading in terms of standardized estimate (λ) ranged from 0.737 to 0.925 and more than 0.7, and the z-test value of all the observed variables were between 17.4 to 21.9 and greater than 2. So, they complied well with the statistical principles. It means that, the indicators of observe variables can be used to measure the three latent variables.

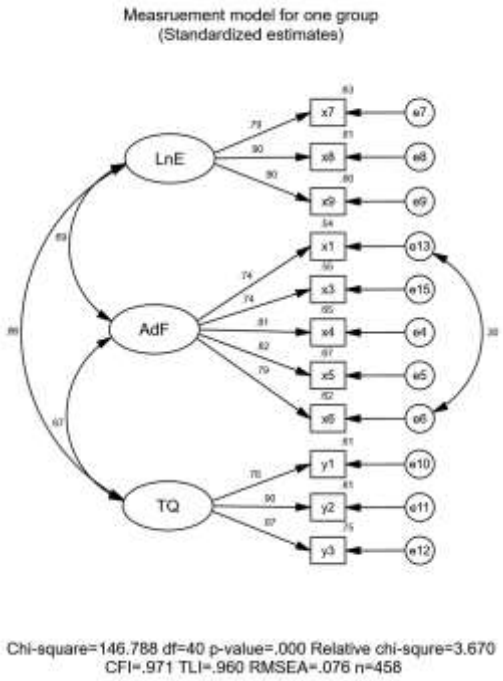

Figure 2. The Measurement Model in standardized estimates of one group

4) Measurement Quality

a. Reliability

Table 6. The Composite Reliability, Average Variance Extracted, and Maximum Reliability of latent variables in the measurement

	CR	AVE	MaxR(H)
AdF	0.885	0.606	0.888
LnE	0.898	0.747	0.910
TQ	0.889	0.728	0.900

Table 6 showed that, the Composite Reliability (CR) of the three latent variables were between 0.885 to 0.898 and they were all more than 0.7. this is one of the reliabilities of the measurement model. Another indicator was that, the Maximum Reliability (MarR) of latent variables were between 0.888 to 0.91 for which were all greater than their Composite Reliability. Therefore, the reliability of measurement quality had statistical significance.

b. Validity

Convergent

The value of Average Variance Extracted (AVE) from the latent variables ranged between 0.606 to 0.728 in Table 4.5. All these values were more than 0.5 and had statistical significance. Therefore, the indicators of latent variables in this study have convergent validity.

Discriminant

Table 7. Heterotrait-monotrait Ratio (HTMT)

LtV	AdF	LnE	TQ
AdF	1.000		
LnE	0.695	1.000	
TQ	0.688	0.870	1.000

Heterotrait-monotrait Ratio analysis showed in the Table 7 reflected that, the thresholds of the latent variables were between 0.695 to 0.87, and they were all less than 0.9. It means that the thresholds are acceptable and the indicators of latent variables have discriminant validity.

5) Multigroup Analysis

Because the following will be a comparison and analysis of the differences in various indicators of different groups of measurement models, the researcher will divide the model to two groups by setting equality constraint in acceptable level for multigroup models, which will be Fine arts group and Design group. In this way, the data of various observable variables and latent variables in multigroup will be compared and studied to measure whether they can meet statistical significance.

Table 8. The invariance test of multigroup

steps	Invariance test	Comparison	X^2	df	$\triangle X^2$	$\triangle$df	p-value
1	Configural invariance	_	264	82	_	_	_
2	Metric invariance	Mo2-Mo1	276	90	12	8	0.045
3	Scalar invariance	Mo3-Mo2	284	98	8	8	0.098
4	Strict invariance	Mo4-Mo3	285	101	1	3	0.242

From the data of the above indicators in Table 8, it can be seen that in the four types of invariance tests run, the p-value of the measurement model is less than 0.05 in the configuration variance test and the metric variance test, and has statistical significance. However, due to the stronger interception ability of the metric variance test compared to the configuration variance test, this study will choose the metric variance test for multigroup measurement model analysis.

Table 9. The statistical description of indicators

indicator	Major	n	$\bar{x}$	s.d.	Skew	se	Kurtosis	se
x1	fine art	259	3.87	0.790	-0.838	0.151	1.660	0.302
	design	199	3.92	0.645	0.056	0.172	-0.852	0.343
x2	fine art	259	4.07	0.850	-1.061	0.151	1.363	0.302
	design	199	4.00	0.694	-0.297	0.172	-0.229	0.343
x3	fine art	259	3.81	0.823	-0.544	0.151	0.701	0.302
	design	199	3.83	0.759	0.000	0.172	-0.802	0.343
x4	fine art	259	3.78	0.840	-0.449	0.151	0.330	0.302
	design	199	3.74	0.728	-0.089	0.172	-0.244	0.343
x5	fine art	259	3.90	0.803	-0.603	0.151	0.712	0.302
	design	199	3.85	0.760	-0.210	0.172	-0.448	0.343
x6	fine art	259	4.14	0.761	-0.917	0.151	1.429	0.302
	design	199	4.12	0.744	-0.682	0.172	0.285	0.343
x7	fine art	259	3.77	0.842	-0.595	0.151	0.816	0.302
	design	199	3.75	0.733	-0.471	0.172	0.847	0.343
x8	fine art	259	3.69	0.807	-0.428	0.151	0.727	0.302
	design	199	3.67	0.711	-0.409	0.172	0.980	0.343
x9	fine art	259	3.76	0.767	-0.596	0.151	1.029	0.302
	design	199	3.74	0.683	-0.132	0.172	-0.015	0.343
y1	fine art	259	3.94	0.798	-0.627	0.151	0.536	0.302
	design	199	4.00	0.715	-0.556	0.172	0.735	0.343
y2	fine art	259	3.86	0.771	-0.472	0.151	0.589	0.302
	design	199	3.92	0.714	-0.230	0.172	0.192	0.343
y3	fine art	259	3.87	0.819	-0.564	0.151	0.442	0.302
	design	199	3.83	0.739	-0.323	0.172	0.396	0.343

As showed in Table 9, among the eight observation variables x2, x4, x5, x6, x7, x8, x9, and y3, the mean value of Fine arts group was higher than Design, but among the four observation variables x1, x3, y1, and y2, the mean value of Design group was higher than Fine arts. In addition, the standard deviation (s. d.) of all observation variables in the Design group was smaller than that of the Fine Art group, and was closer to 0.5. This indicated that although the data of both groups were consistent with statistical significance, the standard dispersions of observed variables in the Design group had better quality. In terms of skewness, although the indication of both groups were between - 2 and 2 and met statistical requirements, the skewness of all observed variables in the Fine Arts group was slightly greater than that in the Design group. In terms of kurtosis, although the kurtosis of both groups conforms to the principle of

normal distribution, except for x3 and y1, the Fine Art group shows higher kurtosis than the Design group.

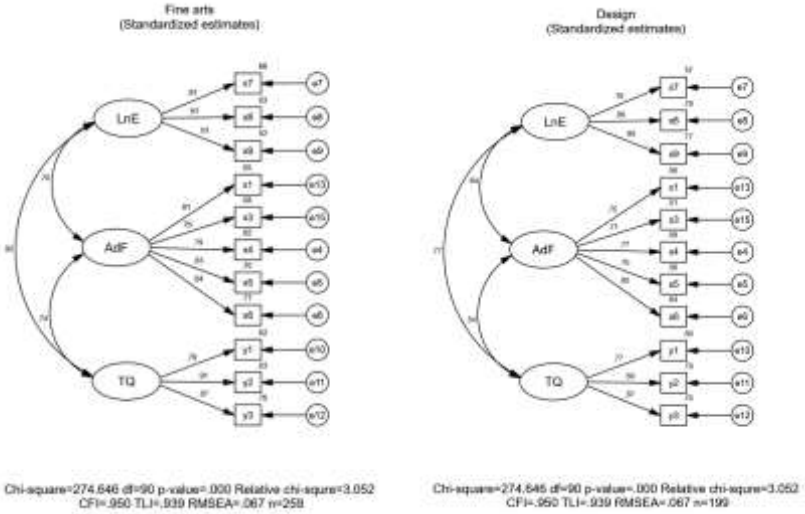

Figure 3. The Measurement Model in standardized estimates of two groups

Table 10. The factor loadings of two-group models.

			95% Confidence Intervals						
Group	LaV	ObV	λ	se	Lower	Upper	λ	z	p
Fine art	AdF	x1	1.00	0.0000	1.000	1.00	0.806		
		x3	1.03	0.0619	0.909	1.15	0.762	16.6	< .001
		x4	1.08	0.0612	0.959	1.20	0.789	17.6	< .001
		x5	1.09	0.0596	0.976	1.21	0.834	18.3	< .001
		x6	1.08	0.0574	0.972	1.20	0.842	18.9	< .001
	LE	x7	1.00	0.0000	1.000	1.00	0.813		
		x8	1.09	0.0497	0.996	1.19	0.910	22.0	< .001
		x9	1.04	0.0474	0.946	1.13	0.908	21.9	< .001
	TQ	Y1	1.00	0.0000	1.000	1.00	0.787		
		Y2	1.13	0.0529	1.026	1.23	0.912	21.4	< .001
		Y3	1.15	0.0560	1.038	1.26	0.872	20.5	< .001
Design	AdF	x1	1.00	0.0000	1.000	1.00	0.751		
		x3	1.03	0.0619	0.909	1.15	0.713	16.6	< .001
		x4	1.08	0.0612	0.959	1.20	0.768	17.6	< .001
		x5	1.09	0.0596	0.976	1.21	0.748	18.3	< .001
		x6	1.08	0.0574	0.972	1.20	0.798	18.9	< .001
	LE	x7	1.00	0.0000	1.000	1.00	0.758		
		x8	1.09	0.0497	0.996	1.19	0.882	22.0	< .001
		x9	1.04	0.0474	0.946	1.13	0.877	21.9	< .001
	TQ	Y1	1.00	0.0000	1.000	1.00	0.774		
		Y2	1.13	0.0529	1.026	1.23	0.889	21.4	< .001
		Y3	1.15	0.0560	1.038	1.26	0.870	20.5	< .001

Table 10 showed that the factor loading was divided into two groups. In Fine arts group, the observe variables' factor loading in terms of standardized estimate (λ) ranged from 1.00 to 1.15 and more than 0.7, and the z-test value of all the observed variables were between 16.6 to 22 and greater than 2. In Design group, the observe variables' factor loading in terms of standardized estimate (λ) ranged from 1.00 to 1.15 and more than 0.7, and the z-test value of all the observed variables were between 16.6 to 22 and greater than 2. So, the observe variables of Fine arts group and Design group complied well with the statistical principles., and their indicators of observe variables can be used to measure the three latent variables.

a. Multigroup reliability

Table 11. The Composite Reliability, Average Variance Extracted, Maximum Shared Squared Variance, and Maximum Reliability of latent variables in two group

Group	LtV	CR	AVE	MaxR(H)
Fine arts	AdF	0.904	0.654	0.906
	LnE	0.911	0.774	0.919
	TQ	0.894	0.738	0.906
Design	AdF	0.868	0.569	0.875
	LnE	0.875	0.702	0.893
	TQ	0.881	0.713	0.894

Table 11 showed that, in Fine arts group and Design group, the reliability of measurement quality had statistical significance.

b. Multigroup validity

In Table 11, , the AVE of Fine arts group ranged between 0.654 to 0.774. All of them were more than 0.5 and had statistical significance. The AVE of Design group ranged between 0.569 to 0.713. All of them were more than 0.5 and had statistical significance. Therefore, the two groups' indicators of latent variables in this study have convergent validity.

Table 12. Heterotrait-monotrait Ratio (HTMT) in two group

Group	LtV	AdF	LnE	TQ
Fine arts	AdF	1.000		
	LnE	0.711	1.000	
	TQ	0.766	0.917	1.000
	LtV	AdF	LnE	TQ
Design	AdF	1.000		
	LnE	0.666	1.000	
	TQ	0.552	0.790	1.000

Table 12 showed that, the Heterotrait-monotrait Ratio of Fine arts group were between 0.711 to 0.917, and one of them were a little more than 0.9, but less than 0.95. The Heterotrait-monotrait Ratio of Design group were between 0.552 to 0.79, and they were all less than 0.8. It means that the thresholds of Fine arts group are acceptable and Design group are excellent. Therefore, the indicators of latent variables in two group have discriminant validity.

6) Structural Equation Model

a. Structural equation model in one group

Table 13. Hypothesis of Structural Equation Model in one group

Hypotheses	Paths	95% Confidence Intervals				λ	z	p
		λ	se	Lower	Upper			
				Direct effect				
H1	AdF ⇒ TQ	0.160	0.0530	0.0561	0.264	0.151	3.02	0.003
H2	AdF ⇒ LE	0.743	0.0609	0.6238	0.863	0.692	12.20	< .001
H3	LE ⇒ TQ	0.749	0.0610	0.6292	0.868	0.756	12.27	< .001
				Indirect effect				
H4	AdF ⇒ LE ⇒ TQ	0.557	0.058	0.443	0.67	0.523	9.609	< .001

As showed in Table 13, the p-value of H1 to H4 were less than 0.05 and had statistical signifigance.To sum up, by comparing the four affecting paths, researcher found that , the direct effect of learning enthusiasm (LE) on teaching quality (TQ) had the most significant, with a value of 0.756 (H1). The direct effect of administration factors (AdF) on learning enthusiasm (LE) was slightly smaller than the former, with a value of 0.692. The significant of indirect effect of Administration factors (AdF) on teaching quality (TQ) through learning enthusiasm (LE) ranked third, with a value of 0.523. The direct effect of administration factors (AdF) on teaching quality (TQ) was the least significant, with a value of only 0.151.

b. Structural equation model in multigroup

This research step was referred to as the "moderating effect" by researcher in the methodology earlier. Researcher used Jamovi software to set “mean” constraints for multi-group in the structural equation models, so that the two sets of models could perform data analysis under the same factor loadings state, and ensured that they would be in metric invariance test level.

Table 14. The p-value of chi-square and degree of freedom in multigroup analysis by Amos

	Hypothesis5 (H5)	
	X^2	df
Unconstrained	262.431	82
Constrained	265.078	85
Difference	2.647	3
P-Value	0.449	

Table 14 showed the results of multigroup analysis calculated by Amos software. It represented the Hypothesis5 (H5), which was the moderating effect in this study. The content of H5 is as follows: The relationship models of administration factors affecting teaching quality in Guangzhou Academy of Fine Arts in are different between majors. As we can see in Table 14, the difference between chi-square in unconstrained and constrained model is 2.647 with the degree of freedom 3. Through calculation, Amos displays a p-value of 0.449 which is not statistically significant. Therefore, researcher ultimately found that there was no difference in

the path influence of the structural equation model between the Fine art and Design groups. This indicates that H5 is not statistically significant.

Discussion

1) Discussion 1

Administration factors have positive effect on teaching quality. The verification basis is as follows:

Table 13 showed (AdF ⇒ TQ): There were some positive relationships between administration factors (AdF) and teaching quality (TQ). The factor loading in terms of standardize estimate was 0.151 with the p-value 0.003 which was statistically significant ($p < 0.05$). Therefore, this hypothesis was acceptable.

The results of this study are consistent with the findings of the following scholars: Woessmann's research showed that focusing on the construction of university administrative factors can improve the quality of teaching. (Woessmann, 2016 : 3-32.) Researcher Xiao believed that consolidating and strengthening the administrative management of universities was the foundation for achieving steady improvement in teaching quality. (Xiao, 2019 : 3-32.) In summary, the conclusion of this study is that administration factors have positive effect on teaching quality, which is consistent with the theories proposed by many scholars.

2) Discussion 2

Administration factors have positive effect on learning enthusiasm. The verification basis is as follows:

Table 13 showed (AdF ⇒ LE): There were some positive relationships between administration factors (AdF) and learning enthusiasm (LE). The factor loading in terms of standardize estimate was 0.692 with the p-value < 0.001 which was statistically significant. Therefore, this hypothesis was excellent.

The results of this study are consistent with the findings of the following scholars: Xinrong believes that factors such as the academic atmosphere of the school, the school and dormitory environment, and the teaching level of teachers have an impact on students' learning enthusiasm, indicating that teaching resources and funding, construction of teachers, and other factors in administrative factors are extremely important for learning enthusiasm. (Xinrong, 2021) The research by She Zhiqin and Shi Li points out that the reasons for the current lack of learning enthusiasm among Chinese college students include: some university management methods are too loose, college students lack self-discipline, and fixed teaching models. (She Zhiqin & Shi Li, 2019 : 193-202.) It This indicates that the administrative factors of universities have a positive effect on students' learning enthusiasm. Curriculum development and reform, as well as the improvement of student teacher ratio, are all related to learning enthusiasm. It can be seen that the conclusion of this study is that administration factors have positive effects on learning enthusiasm, which is consistent with the research results of many current scholars.

3) Discussion 3

Learning enthusiasm has positive effect on teaching quality. The verification basis is as follows:

Table 13 showed (LE ⇒ TQ): There were some positive relationships between learning enthusiasm (LE) and teaching quality (TQ). The factor loading in terms of standardize estimate was 0.756 with the p-value < 0.001 which was statistically significant. Therefore, this hypothesis was excellent.

Firstly, Wang Kefang has confirmed from medical courses that stimulating students' interest in learning, mobilizing their subjective initiative in learning, and ultimately improving teaching quality. (Kefang, 1996) Secondly, teachers Shen Qian and Ji Jie discussed how to enhance the learning enthusiasm of college students in a highly informational context. Their research also showed that learning enthusiasm directly affected the quality of teaching. (Shen Qian & Ji Jie, 2022 : 9-11.) Thirdly, Xie Xiquan's research can also support the above argument. He analysed the current situation of students' poor performance in learning enthusiasm and proposed some measures to cultivate students' learning enthusiasm. In his conclusion, he believed that increasing students' enthusiasm for learning can improve the level and quality of university teaching. (Xiquan, 2022 : 245-246.) To sum up, the conclusion of this study is that learning enthusiasm has positive effect on teaching quality, which is consistent with the theories proposed by many scholars.

4) Discussion 4

Administration factors have indirect effect on teaching quality through learning enthusiasm. The verification basis is as follows:

Table 13 showed (AdF ⇒ LE ⇒ TQ): There were some positive relationships between administration factors (AdF) and teaching quality (TQ) through learning enthusiasm (LE). The factor loading in terms of standardize estimate was 0.523 with the p-value < 0.001 which was statistically significant. Therefore, this hypothesis was excellent.

In international research, Brink's research has shown that the indoor environment of universities can affect students' learning enthusiasm, thereby affecting the quality of teaching and students' performance. (Henk W Brink; Marcel G L C Loomans; Mark P Mobach & Helianthe S M Kort, 2020 : 405-425.) In China's research, Wu Yingwang (Yingwang, 2022 : 144-146.) found in the reform of English education curriculum that curriculum reform can enhance their learning enthusiasm and ultimately achieve the goal of improving students' teaching leadership. From the above discussion, it can be seen that the conclusions of this study and the current research results of scholars, such as dogs, can prove that administrative factors indirectly affect the quality of teaching through learning enthusiasm.

5) Discussion 5

The relationship models of administration factors affecting teaching quality in Guangzhou Academy of Fine Arts in Guangdong province have no difference between majors. This conclusion is different from the hypothesis5 of this study.

Table 14 showed, the difference between chi-square in unconstrained and constrained model was 2.647 with the degree of freedom 3. Through calculation, Amos displays a p-value of 0.449 which was not statistically significant. Therefore, the researcher ultimately found that there was no difference in the path influence of the structural equation model between the Fine art major and Design major in Guangzhou Academy of Fine Arts in Guangdong province.

Although the above studies cannot prove that the path effects are different under the different majors, but many current studies have mentioned that students from different majors have different understandings and performances in many aspects. The experimental results of Zhang Yan (Zhang Yan & Li Qiong, 2021 : 134-135.) show that there are differences in the level of mastery of professional knowledge among students of different majors. Yang Xiaofang and Dai Bo's (Yang Xiaofang & Dai Bo, 2020 : 71-75+79.) experimental analysis of students from different majors revealed differences in their outlook on life and values. Peng Anhui and Hu Hongrui (Peng Anhui; Hu Hongrui; Liu Li; Zhao Xiaodeng & Zhu Peijia, 2015 : 316-318.) studied the differences between students in different majors from the perspective of

humanistic literacy. They found that students from different majors may experience cognitive differences in certain aspects of humanistic literacy due to differences in learning environments and theoretical systems. Chen Zhijian and 's research shows that there are significant differences in stress coping styles among students in different majors. (Chen Zhijian & Gou Xiaoping, 2012 : 71-72.) Zhang Wenping used the theory of curriculum to prove that teachers should design courses for students of different majors in order to improve the overall teaching quality of the course. Jinhua also analysed from the perspective of curriculum teaching, believing that students from different majors should adopt different teaching courses and experimental projects, in conjunction with their professional theoretical teaching, to achieve better teaching results.

Perhaps the students of these two majors at Guangzhou Academy of Fine Arts, who lived in a common campus environment, had a similar understanding of the impact of administrative factors on teaching quality. But this is just a guess from researcher, and more importantly, future research needs to be further analysed.

Recommendation

Education Policy

1. The Guangdong Provincial Government should attach importance to the role of art education and further support GAFAU financially, so that this 70 year old university can better develop and become a world-class art university.

2. In the past decade, Guangdong Province has begun to attach importance to the development of university quality and has invested a large amount of funds in the construction of universities. During this process, the economic budget figures of many universities have been greatly improved. This provides strong guarantees for the campus construction, curriculum reform, faculty introduction, and equipment updates of Guangdong University. How to utilize the opportunity of Guangdong Province's policies to support the development of education to further improve the quality of teaching is a question worth pondering by the administrative leaders of Guangzhou Academy of Fine Arts.

Suggestions for university administration work

1.In terms of courses, GAFAU should design or adjust the content and teaching methods of courses reasonably for students of different majors and courses.

2. In terms of teaching resources and funding, GAFAU should utilize various financial support from the Guangdong Provincial Government to increase the construction of campus environments and equipment updates. Improving the living environment, teaching environment, and professional equipment can enhance students' learning comfort and their satisfaction with the school.

3. Leaders of GAFAU should pay attention and control the student teacher ratio in a good proportion to ensure the quality of education.

4. In terms of school goals, GAFAU's administrative leaders should better plan ways to achieve them, and effectively implement and optimize each task, so that teachers and students can fully play their individual role and increase collective cohesion.

5. In terms of enrollment management, GAFAU should further optimize the examination system to further select students with excellent academic performance and artistic potential.

6. In terms of construction of teachers, firstly, GAFAU administrative leaders should strengthen the system of teacher recruitment, introduce high-level talents, further enhance the academic level and teaching ability of the teacher team; Secondly, GAFAU should further promote the continuing education and training of teachers.

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