

ISSN 2821-9074 (Online)

ISSN 2730-2601 (Print)

RICE Journal of Creative Entrepreneurship and Management, Vol. 4, No.1, pp. 65-76,

January-April 2023

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doi: 10.14456/rjcm.2023.5

Received 11.10.22/ Revised 1.04.23/ Accepted 15.04.23

The Professional Competencies of Art Teachers to Teach Non-art Students in Colleges and Universities in Guangxi Province

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Abstract

The requirement for all students in Chinese colleges and universities to take art subjects before graduation has created concerns as to how to prepare art teachers with proper and effective qualities and professional competencies. The objectives of this research were: (1) to determine the professional competency models of art teachers to teach non-art students in Chinese colleges and universities; (2) to assess the quality of the developed professional competency models; and (3) to evaluate the best fitted professional competency model with empirical data from art teachers. The research used a mixed method with a theoretical framework based on literature review and consultation with five local experts. The respondents were 507 art teachers drawn by using multi-stage random sampling from the population of 3,243 art teachers in colleges and universities in Guangxi Province. The instrument was a questionnaire constructed with specifications on target data to be obtained. The statistics used in the study included descriptive statistics, chi-square test, confirmatory factor analysis, one-factor, multi-factor, second-order-factor and bi-factor analyses, and model comparison, using likelihood ratio test. The research findings revealed that: (1) there were four alternative models for art teachers' professional competencies; (2) except one-factor model, the remaining three models showed acceptable qualities, in terms of both validity and reliability; and (3) the bi-factor model was the best fit model. The bi-factor model composed of a general factor and six specific factors, namely, achievement, affiliation, power, management, cognitive, and personal effectiveness, respectively.

Keywords: *Art teachers, art education for non-art students, professional competency model, colleges and universities in Guangxi Province*

1. Rationale and Background of the Study

Recently, China has positioned art education to maintain and sustain in perception regarding the function of art in Chinese society. Such positioning views art as not only a specialty restricted to artists but also a basic quality for every Chinese citizen who lives in modern society (Boyd, 1999; Zhang, 2020; Wei, 2008). From 2006 to 2020, the Minister of Education of China (MOEC) issued policies on art education or aesthetic education stipulating that students in colleges and universities be required of art course credits for

graduation (MOEC, 2006, 2019, 2020). Educational management in higher educational institutions is specialized by various disciplines, and requires students to be screened for enrolment in various majors by their aptitudes and interests. Provision of a cross-disciplinary course like art education for non-art students therefore poses a challenging demand. To make teaching and learning activities in the classrooms effective, the art education course requires to a great extent that art teachers possess certain capabilities and skills to deal with both academic contents and students' attention and understanding. For art teacher education and training, the key competencies of art teachers to teach non-art students has been a focal concern for all parties involved. The authors of this paper have perceived an urgent need for research into the desired competencies—knowledge and skills—for those art education teachers who are to teach non-art education students in colleges and universities. The Chinese government has also encouraged and supported research on the art education trend to obtain findings as foundations to formulate relevant policy and implementation in this particular discipline. As seen in this paper, the researchers gave brief conceptual backgrounds of the research design and specific theoretical aspects in the sections that follow.

1.1 Art Education for Non-Art Students

Art education for non-art students is primarily art-oriented education open to all students at Chinese colleges and universities (Guo, 2012; Liu, 2012). The differences between art education for professional art students and art education for non-art students are teaching objects (Liu, 2012), teaching contents, and teaching purposes (Xie, 2020). Aesthetic education aims to cultivate learners' abilities to recognize, experience, appreciate and create beauty (Wan & Song, 2020; Xu, 2018; Huang, 2021). Promoted moral level is in fact a profound aim of art education (Meng, 2020). In this study, the researchers put emphasis on the general and special characters of art education for non-art students in Chinese colleges and universities. Effective learning depends on many factors, though teachers are typically expected to be well prepared to motivate and inspire students with various learning abilities and interests. For the case of non-art students learning art education, certain knowledge, skills and pedagogy are specifically required. The researchers needed to collect information on learners' willingness, behaviour, and reflection from current art teachers via a questionnaire on professional competencies. The purpose was to have a good understanding of effective art education for non-art students.

1.2 Competency Theories

The term competency was first proposed by the famous American psychologist David C. McClelland in 1973 (McClelland, 1973). There were many definitions on competency (Levenson, Stede & Cohen, 2006); Zhong & Shi, 2003). The definition by Spencer and Spencer (1993) was widely used: "competency" as an underlying characteristic of an individual that is causally related to criterion-referenced effective and/or superior performance in a job or situation (Spencer & Spencer, 1993). In this study, the researchers used Spencer's definition of competency as the main reference for elaborating the concepts. According to Spencer & Spencer (1993), there are six types of competencies: achievement,

affiliation, power, management, cognitive, and personal effectiveness, respectively (Spencer & Spencer, 1993).

- The achievement competency is reflected in achievement orientation (ACH), Initiative (INT), concern for order and quality (CO), and information seeking (INFO).
- The affiliation competency is reflected in interpersonal understanding (IU) and customer service orientation (CSO).
- The power competency is reflected in impact and influence (IMP), organization awareness (OA), and relationship building (RB).
- The management competency is reflected in developing others (DEV), directiveness (DIR), teamwork (TW), and team leadership (TL).
- The cognitive competency is reflected in analytical thinking (AT), conceptual thinking (CT), and professional knowledge (EXP).
- The personal effectiveness competency is reflected in self-control (SCT), self-confidence (SCF), flexibility (FLX), and organizational commitment (OC).

1.3 Factor Analysis Models

In this study, four statistical models were used to analyze the obtained data. Of these four models, a comparison was carried out to determine the best-fit model of professional competencies of art teachers for non-art students, as shown below:

1.3.1 One-Factor Model (Single Factor)

This model was based on Alfred Binet's intelligence theory (Binet & Simon, 1997). The one-factor model was a confirmatory factor analysis (CFA) model corresponding to the total score method. It took the whole construct as factors (latent variables) and all topics as observation indicators. As the only factor, general competency (overall construct) was directly defined on 20 observation indicators. In this study, the researchers hypothesized the art teacher's competency as the one-factor model among the four alternative models.

1.3.2 Multiple-Factor Model

The multi-factor model was based on the theory of E. L. Thorndike (1927), who believed that there was nothing like General Ability and each mental activity required an aggregate of different sets of abilities. The multiple-factor model was a CFA model corresponding to the component reporting method. It took each dimension as a factor, the corresponding topic as an observation indicator, and used factor correlation to reflect the covariance between dimensions. Therefore, the model was also called "correlation trait model." Like the component reporting method, although the model could test the unique effects of each dimension, it could not analyze the common effects between dimensions. In this study, the researchers hypothesized the art teacher's competency as the 6-factor model among the four alternative models.

1.3.3 Second-order model

The second-order factor model assumed that each first-order factor was directly affected by two factors at the same time; one was the second-order factor representing general competency ("g" factor), explaining the common variation between dimensions; the other was the residual of the first-order factor, explaining the special variation of each dimension. In this study, the researchers hypothesized the art teacher's competency as the

second-order factor model among the four alternative models, which consisted of art teacher's competency--general competency as a primary factor, and the other six hierarchical factors (Thorndike, 1927; Cortina, 1993; Hu, 1999).

1.3.4 Bi-factor model

The last alternative model, the researchers hypothesized the art teacher's competency as comprising 2 types of factors--the first was the g-factor which held that an underlying factor of general-art-teacher competency existed and formed the foundation out of all intellectual abilities; and the second was the s-factor or the specific factors. In a bi-factor model, a general factor and multiple group factors (or domain-specific factors) competed to explain the variance of the indicators, and no factor was higher than the other. In this study, the researcher hypothesized the art teachers' competencies as categorized into the bi-factor mode--holding general-art-teacher competencies and special competencies (Thorndike, 1927; Cortina, 1993; Hu, 1999).

2. Research Objectives

In this study, there were three main objectives:

- 1) To determine the professional competency models of art teachers to teach non-art students in Chinese colleges and universities.
- 2) To assess the quality of the developed professional competency models of art teachers to teach non-art students in colleges and universities.
- 3) To evaluate the best fitted professional competency model with empirical data from art teachers.

3. Research Methodology

3.1. Population and Samples

The population in this research was art teachers teaching art courses to non-art students in 38 colleges and universities in Guangxi Province, totalling of 3,243 persons. The Optimal Design Software was used to calculate the sample size, indicating that the sample size of at least 500 was acceptable. To guarantee the minimum, the researchers sent out 520 questionnaires and the actual return was 507, or 98 percent.

3.2. Instruments and Data Analysis

A Likert-type self-rating questionnaire, consisting of six detailed parts was used to collect data on Achievement, Affiliation, Power, Management, Cognitive, and Personal Effectiveness, respectively (Likert, 1932). The Item-Objective Congruence (IOC) was used to evaluate the validity of the questionnaire by five local experts. The items with IOC scores lower than 0.8 were revised. The final draft of the questionnaire consisted of 67 items, which were further used for a reliability try-out. Based on Cortina's criteria (1993), the Cronbach's alpha coefficient for the final questionnaire of 65 items was 0.983. The computer software, SPSS, was used for descriptive statistics and AMOS for hypothesis testing and model evaluation.

4. Research Results

4.1. Demographic Characteristics

Of 507 respondents, 59 percent was male, in contrast to 41 percent female, with no obvious indication of gender bias. The majority (73.2%) of the respondents were between 31-55 years old, followed by 19.5 percent in their 30s or below, and the remaining 7.3 percent over 55. Most respondents (67.75%) were holding graduate degrees, with 67.8 percent Master's, 24.1 percent doctoral, and the remaining 8.3 percent with Bachelor's degrees. As for work experience, most of the respondents (78.7%) were in the range between 6 to 15 years, and about 10 percent in the ranges of less than 6 years and more than 16 years. Most of the respondents were holding lecturer titles (37.9%), associate professors (47.7%), professors (12.8%) and assistant professors (1.6%), respectively.

4.2. Analysis of the Models

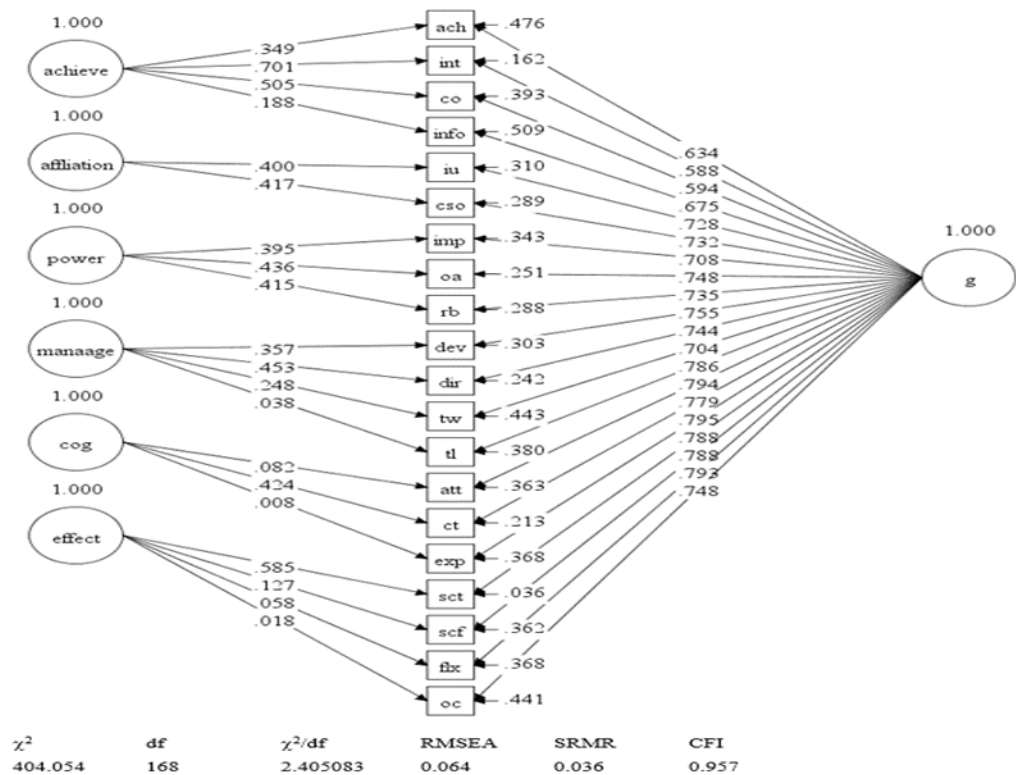
The four alternative models were tested by using chi-square tests, confirmatory factor analysis and an AMOS computer software, and each model revealed certain peculiarities. In the one-factor model (chi-square value=903.522; df=170; ratio value=5.3148; CFI=0.859; RMSEA=0.112; and SRMR=0.053), the overall analysis indicated the measurement model was acceptable (Hu & Bentler, 1999). Though the indicators showed that all 20 factor loadings were statistically significant, ranging from .622 to .794, and the coefficient of determination (R^2) ranges from .387 to .630, the interpretation was that all indicators could be used to measure art teachers' competencies as one general factor at a moderate level. It appeared that one-factor model might not be suitable to access the competencies of art teachers for non-art students in colleges and universities.

In the multiple-factor model, the statistics (chi-square value=527.186; df=155; ratio value=3.401; RMSEA=0.083; SRMR=0.042) showed that it was acceptable (Hu & Bentler, 1999), and the CFI value was 0.982, indicating the model fitted well. The multiple-factor model was good for accessing the competencies of art teachers for non-art students in colleges and universities in Guangxi province. All of these factors were statistically significant with loadings more than 0.50 in standardized scores. The composite reliability (CR) of all factors was over .70, which met the cutting point (Hu & Bentler, 1999) and the means all factors at an acceptable reliability.

In the second-factor model, the statistics (chi-square value was 597.758; df=164; ratio value=3.6449; RMSEA=0.088; SRMR=0.047), showed that it was acceptable (Hu & Bentler, 1999), and the CFI value was 0.916, indicating that the model fitted well. All of the indicators had significant factor loading values more than .70, which indicated that they were good indicators (Hair et al., 2017) for measuring the professional competencies of art teachers for non-art students in colleges and universities in Guangxi Province.

The bi-factor model analysis, shown in a graphical model in Figure 1, with the key statistics (chi-square value=404.054; df=168; ratio value=2.4051; RMSEA=0.064; SRMR=0.036), indicating that it was acceptable (Hu & Bentler, 1999). The CFI value was 0.957, also indicating that the model fitted well. The bi-factor model was good for accessing the competencies of art teachers for non-art students in colleges and universities.

Figure 1: Bi-factor Model in Standardized Mode



In addition, Table 1 shows the estimated factors loadings of general factors and specific factors of the bi-factor model of art teachers’ competencies in Guangxi Province. The general factor revealed the factor loadings of more than 0.50, which were statistically significant and showed the convergent validity (Hair et al., 2017), and the omega hierarchical reliability at 0.939, which was at a high level.

4.3. Reliability of Bi-Factor Model

Cronbach’s alpha coefficient has been recognized as a popular method to evaluate the reliability of the scale. However, measurement specialists have reiterated the limitations of coefficient alpha and demonstrated that its assumptions were likely to be violated in practice, and provided alternatives that were not dependent on such unrealistic assumptions. The omega coefficient gradually replaced the Cronbach’s alpha coefficient (Peters, 2014).

The omega hierarchical (ω_h) represents the proportion of variance of the total scores explained by the single general factor in the bi-factor. The ω_h value based on the data obtained in this study was 0.939, meaning 94% of the variance generated by general competencies.

The omega hierarchical subscale coefficients (ω_s) can also be calculated for each subscale that provides an estimate of subscale reliability, controlling the general factor (Peters, 2014). Based on the bi-factor model data, the omega hierarchical subscale coefficients value on achievement was 0.008, on affiliation at 0.004, on power at 0.005, on management at 0.005, on cognition at 0.001, and on personal effectiveness at 0.003,

respectively. Relative to the general factors, the reliability of each special factor (ω_s) was low.

The Explained Common Variance (ECV) estimates the proportion of the common variance in the bi-factor model attributable to the single general factor, and thus it is considered an indicator of uni-dimensionality. A high ECV indicates that the obtained data have a strong general factor compared to group factors. In this study, the ECV value was 0.969, the deviation of parameter estimates (such as general factor loading and path coefficient) generated by fitting the multidimensional test data with a one-dimensional model was small but acceptable. The high ω_h and high ECV of the general factors indicated the reliability and high intensity of the identified general competencies.

Table 1: Factor Loadings in Standardized Mode and R2 of Bi-Factor Model

Indicators	Fcators							R ²
	general	achieve	affiliation	power	manage	cog	effect	
ach	0.636**	0.346**						0.524
int	0.589**	0.701**						0.838
co	0.595**	0.503**						0.607
info	0.674**	0.188**						0.490
iu	0.728**		0.401					0.691
cso	0.732**		0.416					0.710
imp	0.709**			0.392**				0.657
oa	0.751**			0.430**				0.749
rb	0.738**			0.409**				0.712
dev	0.765**				0.254**			0.650
dir	0.744**				0.497**			0.800
tw	0.706**				0.227**			0.550
tl	0.77**				0.132**			0.610
att	0.791**					0.159		0.651
ct	0.782**					0.079		0.617
exp	0.795**					0.08		0.638
set	0.796**						0.231**	0.687
scf	0.79**						0.138	0.644
flx	0.791**						0.115**	0.640
oc	0.743**						0.107**	0.564
Σ	14.625	1.738	0.817	1.231	1.11	0.318	0.591	
$\omega_h =$	0.939							
$\omega_s =$		0.008	0.004	0.005	0.005	0.001	0.003	

Note: ** = $p < .01$, ω_h = Omega hierarchical coefficients, ω_s = Omega hierarchical subscale coefficients

4.4. Comparison of Fitting Indexes of Models

Table 2 shows the indicator values on the models fit among the four alternative models. Comparatively, the chi-square value of the bi-factor model was the least among the four models, with the value of 518.059. On the RMSEA values, the bi-factor model showed the least values of 0.082, while the RSMR values, the bi-factor model shared the least value of 0.04 with the one factor model. On the CFI values, where the criterion suggests the highest value is the most desirable, the bi-factor model also showed the highest value of 0.93. Thus, it could be taken that the bi-factor model was the most suitable model in explaining the professional competencies of art teachers for non-art students in colleges and universities in Guangxi Province.

Table 2: Summary of Fit Statistics for Alternative Models

Alternative Models	χ^2	df	χ^2/df	RMSEA	SRMR	CFI
1. Onefactor	903.522	170	5.314835294	0.112	0.04	0.859
2. multifactor	527.186	155	3.4012	0.083	0.042	0.928
3. 2ndorder	597.758	164	3.644865854	0.088	0.047	0.916
4. Bifactor	518.059	155	3.342316129	0.082	0.04	0.93

5. Discussion

This study revealed that the bi-factor model was the most suitable model in evaluating art teachers' professional competencies for non-art students in colleges and universities. As for the achievement competency, to comply with the government policies, art teachers should understand well the goals of art education for non-art students in colleges and universities as well as other related information. The finding from this study was consistent with the study carried out by Kong (2012).

The affiliation competency suggested that art education for non-art students be different from art major students; therefore, art teachers should pay attention to their specialty as adjusted to those students with no basics in art. They may be able to understand the art knowledge, but they may not be able to master the art skills as quickly as art major students. Art teachers need to understand the situation of non-art students (Xu, 2018). Further, art teachers need art professional competencies to teach non-art students, and help them to attain the identified goals of art education for non-art students (Tang, 2021; Wan & Song, 2020).

As for the power competency, art classroom can be considered as a temporary organization. In this organization, an art teacher has power to play a critical role to organize efficient teaching and learning activities. In the practice of school education by controlling teachers' power, building dialogue relationships, cultivating learning communities, and balancing the relationship between power and non-power, the teachers can give full play to the role of teachers' influence (Sun & Sun, 2020). As for art teachers, the power competency mainly acts as general competency in creating good products or lessons as well as delivering quality services or teaching (Sukiam & Likitsarun, 2021).

The management competency also acts as general competency, especially in a company, factory, or other organizations with definite goals. Some researchers suggest that classroom management of colleges and universities, based on the humanistic management theory, has the characteristics of scientific, humanistic, and innovative dimensions (Jin, 2022). In the area of art education for non-art students, such as painting, it is only embodied that art teachers direct the students to draw and finish the painting work.

The cognitive competency acted as part of the competencies of teachers. Sun (2012) asserted that teachers' cognitive ability was the basic condition in improving teachers' professional quality in teaching, optimizing teaching effects, and realizing educational and teaching goals. As for art education, getting a good cognition on concepts of art, education, innovation and authentic assessment of the target learning outcomes (Petchroj, 2022) will

help promote the teaching quality in attaining the goals of art education for non-art students in colleges and universities.

As for the personal effectiveness competency, teaching and educating are the basic work content for teachers. Students not only gain knowledge from teachers, but also get good quality training from their teachers. Undoubtedly, the influence of teachers' good character on students is vitally important. A teacher's character is an irreplaceable educational factor, and it will have a profound impact on students' life.

6. Conclusion and Recommendations

6.1. Conclusion

This study aimed to identify the professional competency model of art teachers for non-art students in Guangxi Province, using four alternative factor analysis models and competency classification from Spencer's competency dictionary. Through the factor analysis and comparison of the models, it was found that except one-factor model, the remaining three models were statistically acceptable. Comparatively, the bi-factor model was the best fit professional model, which showed the best values on the chi-square test, RMSEA, SRMR, and CFI. The model contained two main factors--general and specific competencies, with six sub-dimensions: achievement, affiliation, power, management, cognition, and personal effectiveness competency.

6.2. Recommendations

Based on the research findings, the researchers would like to suggest that the policymakers should focus on both art teachers' general and specific competencies, as requirements for recruited art teachers to teach non-art students. Art teachers should have profound professional knowledge to be able to cultivate and strengthen students' artistic literacy, aesthetic ability, and innovative and broad perspective toward work. The policymakers should also pay attention to the ideological quality of art teachers as ethical educators to help strengthen self-education in learners. In this regard, colleges and universities need to focus on the innovative concept of education and awareness of the country's reform on public art courses at the higher education level.

The researchers also would like to see that art teachers be sensitive to the difference between profession art education and art education for non-art students. Instead of emphasizing the teaching and training of art skills and the indoctrination of art knowledge, art teachers should aim at artistic innovation created by their non-art students. Taking innovation as a major aspect of public art education, teachers will work on innovative teaching content and pedagogy in support of students' ability to innovate in public art, particularly in line with current developments in the art discipline.

6.3. Limitations of the Study and Further Research

The researchers were aware of the limitation in selecting the participating subjects under study in that they were confined to colleges and universities in Guangxi Province. The results and conclusion were not generalized to other educational contexts in China. More diversified subjects should be included in further study to make a comprehensive

picture of the competencies required of art teachers for non-art students. Moreover, this research obtained perception data from the participating art teachers; it would be more convincing to secure empirical data via interview and group discussion to shed light on clear-cut and effective competencies required of art teachers to work with non-art students at colleges and universities in China as well as in similar educational contexts.

7. Acknowledgements

The first author would like to thank most sincerely Dr. Prapatpong Senarith and Dr. Sukhum Moonmuang for their research guidance and kind support in the stages of the doctoral research. Great appreciation was also for the local experts, colleagues, and art teachers who kindly provided needed data for the study.

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