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Models and Measures of Arts Teacher Competency Under COVID-19 Normalization

Yan Pei[1], Manman Wang[1], Yating Zhao[1], and Yihang Du[1,2*]

[1]National Academy of Chinese Theater Arts, Beijing, 100073, China
[2]Beijing Institute of Technology, School of Design and Arts, Beijing, 100081, China

ABSTRACT

Arts teacher competency refer to the collection of professional skills and personality traits that contribute to excellent working performance in accordance to occupation requirements. The education has a huge changed from traditional face-to-face classroom to online environment when the epidemic normalization of COVID-19, and the change has a profound impact on teaching method and puts forward higher requirements for arts teacher's competency. In this paper, we adopt analytic hierarchy process (AHP) to establish an evaluation model for arts teacher competency. The model contained ethic, teaching skills, IT application and non-technical skills (NTS), which provided a theoretical basis for arts teacher selection and continuing education.

Keywords: Arts teacher competence, COVID-19 normalization, Evaluation model

INTRODUCTION

With the continuous development of internet technology, college arts teacher has been adaption new education forms combining traditional classroom with multimedia technology, while the sudden emergence of COVID-19 has completely changed the education forms of college arts teacher in 2020. The teaching mode changed from spontaneous exploration activities to mandatory teaching routine, and online teaching swept the college classroom as a new form of education (Du et al.,2020). The sudden change makes it urgent for college art teachers to improve their competency to adaption the growth required under COVID-19 normalization. Competency is a set of professional skills and personality traits that are essential for a certain profession, which includes ethics, teaching skills, knowledge reserve and other aspects especially for arts teacher. Competency is not only the basic ability for teachers to engage in educational work, but also an important aspect to cope with the changes of epidemic environment. The study of arts teacher's competency would be application for arts discipline education improvement and arts teacher selection.

The research of competency originated in early 1950s and was first proposed by Dr. McClelland. The research of competency is mainly applied to industry job training, human resource management and education teaching system research. In terms of competency, Liu Chuanjian summarized

seven types of civil aviation pilot competency characteristics based on the literature induction method, and adopted the grounded theory proposed by Strauss and Glaser (1967) to code the interview content, and finally identified six psychological competency characteristics of civil aviation pilots in crisis situations, namely, mental toughness, acumen, decisiveness, composure, self-efficacy, and self-efficacy, decisiveness, calmness, self-efficacy, strength of will, and courage to take responsibility (Liu, 2021). Han Lu et al. proposed "T" competency model for public hospital managers, which breaks through the two-dimensional limitations of existing competency models and presents the competency characteristics of public hospital managers in a more comprehensive and three-dimensional way (Han et al., 2022).

The research on competency in the field of education and teaching is more focused on college teachers. Ren Jingjing et al. constructed a competency evaluation model for a team of college counselors, and used hierarchical analysis and expert scoring to find that individual team members have a strong internal drive to pursue self-breakthrough and improvement, which is more helpful to improve the overall competency level of the team(Ren and Dong, 2021). Liu Yanfang et al. studied the competency of college teachers in the context of new liberal arts, defined "new liberal arts" and "teacher competency", summarized the new requirements for the competency of college teachers in the context of new liberal arts, and proposed specific ways to improve the competency of college teachers (Liu et al.,2022). Sun et al. analyzed how the Digital Competence framework for teachers from UNESCO, the European Union, Norway, and Spain reflects the Learner-Centered principle based on the overall competency model for the Education Informatization 2.0 Action Plan issued by the Ministry of Education in April 2018. Learner-Centered" principle (Sun and Li, 2022).

In summary, arts teacher competency is critical aspect for development and the overall progress of the education field. This paper attempts to construct arts teacher competency evaluation model in four aspects: ethics, teaching skills, information technology (IT) application and NTS, and to explore the improvement and optimization of teaching quality in the COVID-19. In order to provide theoretical basis and data support for the selection, management and evaluation of arts teachers in college.

CONSTRUCTING COMPETENCY INDEXES FOR ARTS TEACHER

Since McClelland proposed the concept of competency, it has received attention from various circles of education and management, and the connotation of competency has been enriched and the evaluation indicators have been subdivided. Nowadays, most international scholars define competencies based on the definition proposed by Spencer in 1993: competencies are deep-seated characteristics of individuals such as knowledge, skills, abilities, motivation, attitudes, values, and self-image in a certain field that can be reliably measured or counted (Saaty and Kearns, 1985). Since 1989 McClelland began to observe and study the competency qualities involved in different industries, and after gradual development and refinement distilled 21 generic

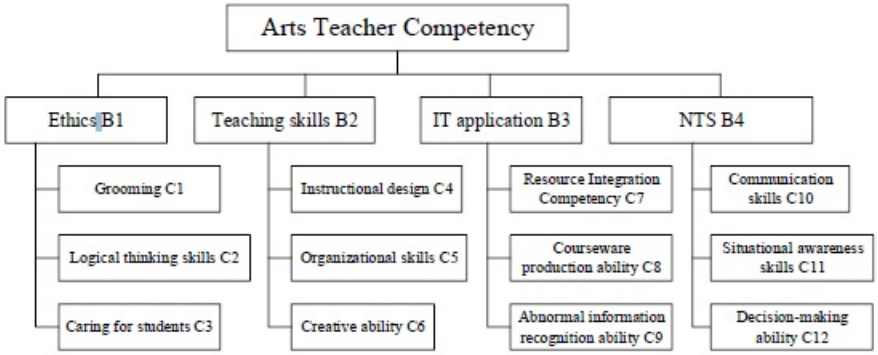

Figure 1: Arts teacher competency evaluation model.

competency elements and constituted a competency dictionary (Competency Dictionary), which includes characteristics such as knowledge and skills, social roles, self-concept, traits, and motivation. At present, the Iceberg competency model (Li et al., 2021) and the Onion competency model are more frequently used in competency research. The Iceberg model divides the composition of human qualities into two parts: the first part is the baseline qualities above the sea level, including human behavior as well as knowledge and skills, and the second part is the potential qualities below the sea level, including social roles, self-concept, traits, and motivation. The onion model is more hierarchical than the iceberg model. The outermost part of this model is the most superficial knowledge and skills, and the innermost part is the most difficult and core motivation and traits of individuals.

The ultimate purpose of the research on the competency of college teachers is to improve the personal qualities of teachers and promote the optimization of teaching quality in college classrooms, as well as to provide specific guidelines for the recruitment, training, assessment and training of college teachers for their positions (Li et al., 2021). In this paper, based on the iceberg model theory, the evaluation indexes were initially determined through open-ended questionnaire research, and then after several rounds of discussion by a group of experts consisting of several teachers who had served for more than 2 years and whose annual assessment was qualified or above, four dimensions and twelve evaluation indexes were finally determined. Specifically, we can consider the overall competence quality of college teachers from the level of teacher moral style, teaching skills, IT application and NTS, among which the teacher moral style includes three parts of appearance, classroom charm and care for students; Teaching skills includes three parts of teaching design, organization ability and innovation ability; IT application includes three parts of resource integration ability, courseware production ability and abnormal information recognition ability; and IT application includes three parts of resource integration ability, courseware production ability and abnormal information recognition ability. The level of NTS includes three parts: communication ability, situational awareness ability and decision-making ability, see Figure 1.

Table 1. Importance assignment.

Scale	Meaning
1	i and j are of equal importance
3	i is slightly important compared with j
5	i is relatively important compared with j
7	i is absolutely important compared to j
2, 4, 6	Intermediate state of the above comparison

CONSTRUCTION OF COMPREHENSIVE EVALUATION MODEL BASED ON AHP

Hierarchy model

American operation researcher Professor Saaty proposed the Analytic Hierarchy Process (AHP) in the 1970s (Saaty and Kearns, 1985), this mathematical method of multi-criteria decision making can realize the transformation from qualitative to quantitative, decompose the complex problem into different constituent factors of multiple levels, decide the relative importance of each level of factors by means of two-by-two comparison The relative importance of the factors at each level is determined by a two-by-two comparison, the weights of the factors at each level are calculated and determined by a specific mathematical method, and finally the essence of the research problem is analyzed based on the ranking of the weights of the factors as a result of the calculation (Li, 2021). The AHP method is hierarchical and systematic, and is often used in the construction of comprehensive evaluation models. Base on the competency list and reference to relevant domestic and foreign materials, the AHP method is used to categorize the evaluation indexes according to the target level, criterion level and sub-criterion level, as shown in Figure 1.

Calculation of Weights

A complete recursive hierarchy is formed for the screened index framework, and the Delphi method is applied to organize the expert group to give feedback on the critical degree of the indexes, respectively, and the two-two judgment matrix is obtained and the weights are calculated through discussion and summary. The importance assignment was constructed by using the 1-7 scale method, which is shown in Table 1.

Inverse the degree of importance of the latter compared to the former when two factors are compared.

The $A = (aij)_{n\times n}$ matrix, represents the relative importance between n indicators, where aij is the expert's assessment of the importance of factor i relative to factor j. The judgment matrix is constructed as follows.

$$A = \begin{bmatrix} a_1 & a_2 & L & a_{1n} \\ a_{21} & a_{22} & L & a_{2n} \\ M & M & O & L \\ a_{n1} & a_{n2} & L & a_{mn} \end{bmatrix} \quad AI = \begin{bmatrix} 1 & 2 & 4 & 5 \\ 1/2 & 1 & 1/2 & 3 \\ 1/5 & 1/2 & 1 & 2 \\ 1/5 & 1/3 & 1/2 & 1 \end{bmatrix}$$

Table 2. Weight of indicators.

Indicators	Ethics	Teaching skills	IT application Skills	NTS
Weight value	0.5025	0.2650	0.1425	0.0875

The relative weights of the compared elements for the hierarchical elements are calculated from the judgment matrix. Taking the judgment matrix *A1* as an example, note that the maximum characteristic root is λ max and its corresponding eigenvector is adopted as Eq.

$$\omega_i = \frac{\omega_i}{\sum_{j=1}^{n} \omega_j} = 4.0189029599$$

Calculating the weight vector from the judgment matrix equation requires the judgment matrix to have a general consistency. Consistency Index (*C.I.*) needs to be calculated

$$C.I. = \frac{\lambda_{\max} - n}{n-1} = 0.0063$$

Calculate Consistency ratio (*C.R.*)

$$C.R. = \frac{\text{C.I.}}{\text{R.I.}} = 0.0071$$

When $C.R. < 0.1$, the consistency of the judgment matrix is considered acceptable. Since $0.0071 < 0.1$, the matrix is proved to pass the consistency test. The weight values of the four first-level indicators were calculated as shown in Table 2.

The factors of the index level were calculated and ranked in the same way, and the correlation calculation results of judgment matrices B1, B2, B3, and B4 were derived in the same way, all of which passed the consistency test.

Finally, the constructed model is subjected to the hierarchical total ranking and its consistency test. The top-down hierarchical ranking is performed by calculating the weight of individual factors of each matrix relative to the overall target, and the relative weights of each index layer and its priority are finally obtained. According to the scoring situation of this decision, the relative weights of each factor in the index layer were calculated and ranked with extreme weights, as shown in Table 3.

DISCUSSION

The importance of ethics ranked first (as shown in Table 3) with a guideline level weight of 0.50. For all teachers, high professional ethics and good personal cultivation are the basic guidelines for teachers to enter the classroom. Compared with secondary education, students' initiative is stronger in higher education, and the subject contents are professional, independent and practical. Teachers in higher education should pay more attention to mutual respect and understanding with students in the teaching process, pay attention to

Table 3. Weights of competency factors.

Criterion layer factors	Ranking	Indicator level factors	Indicator level weights	Ranking	C.R.
B1	1	C1	0.215	6	0.000
		C2	0.430	3	
		C3	0.855	1	
B2	2	C4	0.439	2	0.009
		C5	0.241	5	
		C6	0.133	8	
B3	3	C7	0.273	4	0.004
		C8	0.097	9	
		C9	0.051	11	
B4	4	C10	0.062	10	0.004
		C11	0.175	7	
		C12	0.033	12	

the improvement of their own quality, show good teacher moral and teacher style, and create a good learning atmosphere and a relaxed and equal communication environment for students by example. In the dimension of ethics, caring for students has the highest rating, with an index weight of 0.855 and the first overall weight. College education is essentially a communication and cooperation between teachers and students, and genuine concern for students helps establish a good teacher-student relationship and create a more harmonious and beautiful classroom atmosphere. The second ranking is logical thinking ability, ranked 3rd in total weighting. Logical thinking ability is the key to carry out classroom teaching and communicate the teaching content, and the communication between students and teachers in the college classroom is closer, and logical thinking ability determines whether teachers can effectively communicate their teaching ideas and answer students' academic questions in a timely manner. Grooming is a direct manifestation of teachers' personal spirit and behavior, and it is an important part of university teachers that cannot be ignored in both online and offline teaching.

Teaching skills ranked second in importance, with a guideline tier weight of 0.27. Teaching skills is the fundamental guarantee of teachers' classroom quality, which is reflected in three aspects: teachers' teaching design ability, organization ability and innovation ability. Teaching design is based on teachers' logical thinking ability and IT application, which requires teachers to complete the teaching content specified in the textbook, but also requires teachers to use their creative ability to combine with the actual situation and use new teaching methods such as multimedia courseware and online teaching to realize the organic combination of teaching theory and teaching practice. The second ranking in this dimension is organizational ability, which is ranked 5th in the total weight layer. Teaching organizational ability is closely related to the classroom learning atmosphere, and excellent organizational ability helps teachers create a more orderly and intense classroom learning atmosphere. The third ranking is innovation ability, ranked 8th in total weighting. College teachers not only need to guide students to develop thinking

habits and encourage them to be bold and innovative, but also need to lead students to actively participate in practical innovation activities, in addition, innovation ability is also one of the important ways for teachers to improve themselves.

Information technology competence ranked third with a guideline tier weight of 0.14. Information technology competency refers to teachers' ability to understand, acquire, and use information as well as their familiarity with and mastery of Internet tools. With the popularity of online teaching formats, the importance of IT application for college teachers is growing. In this dimension, the ability of resource integration ranks first, and the total weight ranks 4th. In the current information explosion, college teachers, as the main body of collecting information and imparting knowledge, the ability of processing information and integrating resources largely affects the classroom content and teaching forms of teachers. After the arrival of the epidemic, online teaching forms have been divided into three teaching forms: real-time live lectures, students' independent learning and a combination of the two, and online courses include a combination of audio lectures and slide shows, software demonstration courses and hardware operation courses, etc. Such changes in teaching forms require college teachers to have more proficient courseware making ability and more rapid software learning ability. These changes in teaching formats require college teachers to have more proficient courseware creation and more rapid software learning ability. At the end of the ranking is the ability to identify abnormal information, and the total weight is 11th. Online teaching can play back the course because of the software feature, but the difference between live learning and watching recorded broadcast is not small for students, so even though online teaching provides convenient playback function, college teachers need to pay attention to the identification of abnormal information in the teaching process.

NTS ranked fourth, with a guideline tier weighting of 0.09. Situational awareness is a prerequisite for decision making and communication. Whether in online or offline classes, creating a good classroom atmosphere is more helpful for students to focus their thinking and innovation, and the creation of a good classroom atmosphere cannot be achieved without teachers' excellent situational awareness ability. The second ranking is communication ability, which is ranked 10th in total weighting. Communication between teachers and students is indispensable in college teaching, so communication ability is a necessary NTS for college teachers. In addition, decision-making ability ranked third among the NTS, with a total weighting of 12th.

CONCLUSION

Arts teacher competency involves ethics, self-management, teaching skills and NTS. This study conducted a questionnaire survey based on literature analysis in four aspects: teacher moral, Teaching skills, IT application and NTS, and used the hierarchical analysis method combined with group decision making to assign the indexes, and finally constructed the competency model of college teachers. The role that teachers should play in teaching activities since the epidemic was explored and studied, and the teaching responsibilities

of college teachers were clarified. It is expected that through further research, a comprehensive evaluation system for college teachers can be formed to provide a basis for the selection, evaluation and cultivation of teachers and to better guide teaching practice and enrich relevant teaching theories.

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