OPEN ACCESS Freely available online

ISSN 2737-5293
Volume 4, Issue 4
https://www.iikii.com.sg/journal/IJSSAI
International Journal of Social Sciences and Artistic Innovations

Article

Assessment Scale of Core Competencies to Strengthen the Assessment Scale of Core Competencies to Strengthen the Competitiveness of Enterprises in Folk Packaging

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Abstract: The purpose of this paper aims to construct the evaluation scale of professional competence of talents in folklore packaging design, which is a feasible reference basis for improving the professional competence of talents, the standard of enterprises' selection of talents, and the setting of training courses for talents. By adopting Delphi method and factor analysis, professional knowledge, professional skills and professional attitudes were constructed.The results showed that the positive level of the two rounds of expert correspondence was 100%, and the authority level of the expert correspondence was 0.925 and 0.939 respectively, which indicated that the experts' professionalism was sufficient. Besides, the cumulative explanatory variances of the three constructs were 81.478%, 82.288%, and 78.395% and Cronbach's α values were >0.70 after the principal component analysis respectively. The findings of this study concluded that the evaluation scale of the professional competence of talents in folklore-packaging design contains 3 2-level indicators with 12 3-level items of professional knowledge, three 2-indicators with 12 3-level items of professional competence, and 2 2-level indicators with 7 3-level items of professional attitude.

Keywords: Professional ability, Folkloric packaging, Designers, Delphi method

1. Introduction

As the novel coronavirus is contained effectively worldwide, the tourism products of different nations have experienced significant growth alongside the notable rebound of the tourism sector. The integration of packaging design with local folk culture is crucial for the promotion of tourism products. The diversification of these products has led to a growing demand for packaging design technology. The demand for professionals in packaging design is also on the rise. Consequently, having a core competence in talents is essential for enterprises to boost their competitiveness.

As the demand for packaging design incorporating local folk culture grows, it's crucial to reinforce talent training and the advancement of the packaging industry. This not only aids in identifying top-notch design professionals but also guides the development of the folk packaging sector. Additionally, it serves as a powerful instrument to support the folk packaging industry. As mentioned above, this study takes a forward-looking perspective, in line with the industry's need for talents in packaging design, by constructing indicators of professional competence for talents of folklore packaging, and effectively guiding the education and training of related talents, thereby providing useful references. It aims at cultivating the professional competence of talents in folklore packaging, with three dimensions of professional knowledge, professional skills and professional attitude of folklore packaging shown in Liu（2014）. Therefore, the purpose of this study is as follows:

1.To analyse the professional knowledge, skills and qualities of folklore packaging design professionals in accordance with the development of society as well as the requirements of folklore packaging professionals.

2.To construct the scale of professional competence to confirm the professional knowledge, professional skills and professional qualities that the folklore packaging designers are required.

3.To identify the competency scale of folklore packaging professionals as a reference for training course programming for professional staff, in order to enhance the quality of education, professionalism and competitiveness of the industry within the relevant competencies.

2. Literatures Review

At present, there is a clear gap in research on the basic skills and knowledge required for professionals in the field of folk packaging design. With the increasing popularity of folk packaging design in the market, educational institutions are facing the daunting task of

researching and gaining a deeper understanding of this field. Therefore, the discussion of core competitiveness in relevant research is as follows:

Knowles（1970） pointed out that competencies are the knowledge, skills, attitudes, experiences and values that an individual in the practice of his or her profession should possess. Chisholm （1976） studied that there are three factors including knowledge, skills and attitudes that interact with each other and occur simultaneously. Hoachlander（1995）indicated that under the professional model, technical and academic competencies are not only the fundamental competencies for professional workers, but also other competencies such as problem solving, reasoning, and judgement are indispensable for the accomplishment of tasks. Tang（2007） noted that a well-qualified packaging designer with knowledge about the process before and after the printing of packaging should be mastered. Ma（2008）for packaging design skill structure research, packaging designers should have the ability of product positioning, structural design, material selection, graphic design, meanwhile, understand the survey of market demand. Leclerc（2014）identified creativity, exploration, and initiative as watchmen for the level of mature in design. Hu（2009） take industrial design as an example for exploring the design ability that design talents required by the future market should have, which is how to realise the transformation from design knowledge to design ability in teaching of design. Hou（2021）screened the factors of the competency of designers in the context of artificial intelligence, which contains the competency model of designers with 4 first-level and 17 second-level competency factors. Zhng（2019）analysed the connotation of teacher competence, to identify the digital competence of teachers, to construct a model of quality competence for teachers in primary and secondary schools. Peng（2022）found that the professional competence of social work contains three dimensions: professional knowledge, pragmatism, and identity. Dai（2022）used the Delphi method to analyse Chinese teachers' competence in cultural and literary communication, including the five indicators of competence: attitudes, knowledge, awareness, skills, and expected goals, which promotes the development of cross-cultural research. Cao（2015）constructed the competence structure system of industrial designers based on the component sub-theory by using the Delphi method that establishes the evaluation index system of industrial designers' competence. Xu（2024）constructed a core competency model for on-site first aid as a basis for on-site first aid training and examination. As mentioned above, there is a relative lack of research on the competence of designers in folklore packaging. Above all, there is a relative lack of research on the competence of designers in folklore packaging, while most of the articles have explored the competence of teachers and industrial designer. Therefore, it is necessary to draw our attention to the professional competence of people working in the field of folklore packaging design, which is precisely the topic that needs to be explored by researchers at present.

3. Research Methodology and Implementation

3.1. Research Framework

The purpose of this research is to develop an assessment tool for the professional abilities of folk packaging designers. The target participants include instructors from art and design institutions, practicing packaging designers, marketing specialists, and folklore experts, with the research focus being the folk packaging industry.The research methodology based on relevant theories as well as literature is conducted, also, the qualitative and quantitative research in parallel, using Delphi method and literature survey method are used. In this study, the Delphi method was used, which is an anonymous method that allows for the selection of suitable experts to form a panel of experts. The structure of this study, as shown in Table 1, divides the contents of the professional competence for folklore packaging designers into three dimensions: professional knowledge, professional skills, and professional attitudes, as well as nine 2-level indicators with a total of 124 3-level items. The three dimensions are: (i) professional knowledge: basic knowledge, applied knowledge, and feasibility knowledge; (ii) professional skills: research and development skills, practical skills, and applied skills; and (iii) professional attitudes: self-growth, personality traits, and interpersonal communication.The questionnaire in this study was based on a six-point Rickert's scale, i.e., "1" for " extremely unimportant," "2" for "unimportant," "3" for " normal," "4" for "important," "5" for "very important," and "6" for " extremely important.". By exploring the suggestions of experts and scholars on the evaluation of the professional competence for folklore packaging designers through Delphi technique, the reliability test of the exploratory factor analysis is conducted. Also, each of the three-level indexes is established. Therefore, the evaluation scale of the professional competence of folklore packaging designers was constructed.

Table 1. Folklore packaging designer professional ability evaluation scale architecture table.

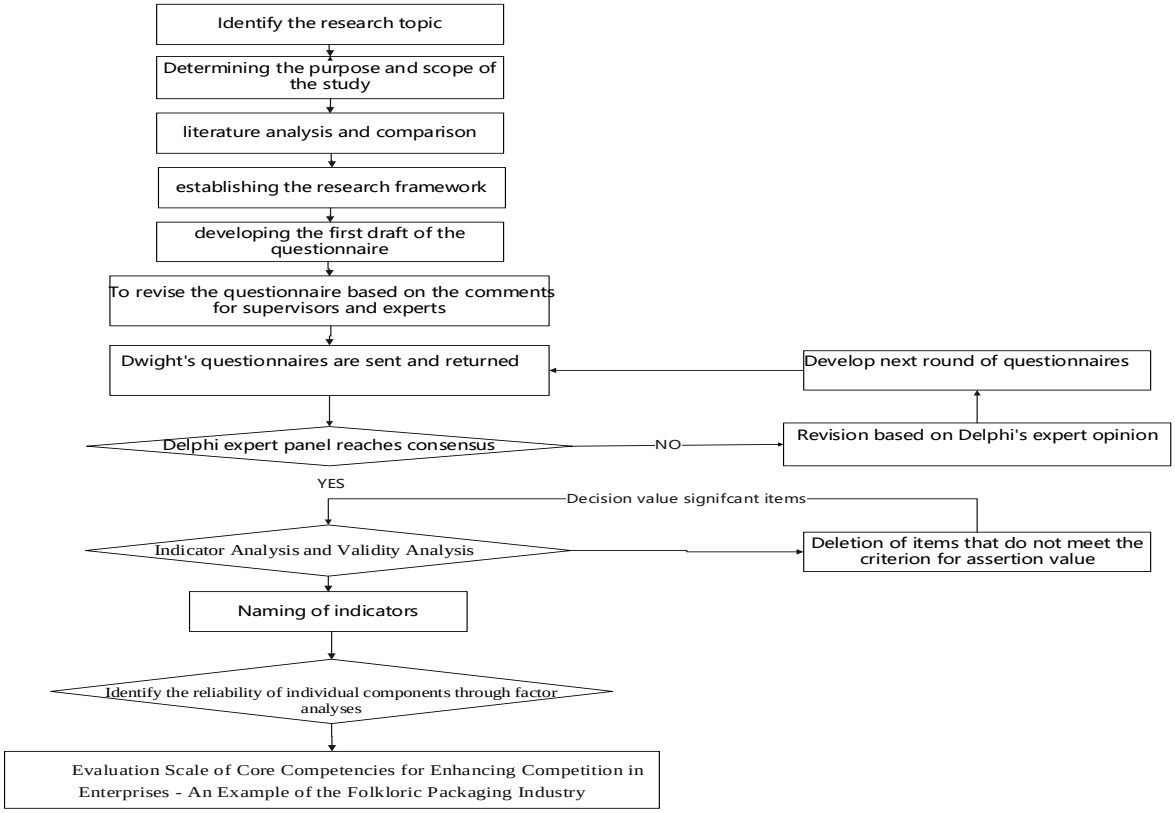
Evaluation indexes of the connotation of professional competence of folklore packaging designers	Professional expertise	Basics: 20 indicators
		Applied knowledge: 19 indicators
		Feasibility knowledge: 9 indicators
	Professional skills profile	R&D skills: 17 indicators
		Practical skills: 26 indicators

	Professional Literacy Component	Applied skills: 8 indicators
		Self-growth: 5 indicators
		Personality traits: 15 indicators
		Interpersonal communication: 4 indicators

3.2. Implementation Procedure

The implementation procedure for the establishment of the indicators for this study is shown in Figure 1. Through the literature analysis and expert consultation, the content of the first round of the Delphi questionnaire was organised. Furthermore, the first round questionnaire is prepared by making amendments based on the comments of the supervising professors. Firstly, the scale was drawn up with a total of 124 indicators in three main dimensions, which included 48 indicators for professional knowledge, 52 indicators for professional skills and 24 indicators for professional attitudes. The author of the research made invitation to 15 experts to participate in the Delphi questionnaire, which was expected to be conducted 2 times. Questionnaire for Round 1 was sent out on the 5th of March with a return date of the 15th of March. The results of the first round questionnaire were analysed by exploratory factor analysis and reliability analysis with the removal of items whose decision values had failed to meet the criteria on which the reliability of the indicators was constructed. Round 2, based on revisions to the Round 1 questionnaire, which was sent out on 25 March, with a return date of 31 March, was agreed upon by the Panel of Experts on Delphi. Furthermore, the results of the second round of questionnaires were filtered by exploratory factor analysis and principal component analysis. After repeated screening, significant items were selected in the factor analysis and the evaluation scale for the professional competence of designers in folklore packaging was constructed.

Fig. 1. Flowchart for the construction of indicators.



3.3. Analysis of Data

Following multiple rounds of filtering, key elements were identified through factor analysis, resulting in the development of an evaluation scale for the professional skills of folk packaging designers. Upon initial assessment using the questionnaire, the indicator met four criteria necessitating its retention.The four criteria were mean greater than or equal to 4, standard deviation less than or equal to 1, quartile difference less than or equal to 0.5, and absolute value of the difference between the plural and the mean less than or equal to 1. All the items were deleted if they did not fulfil the criteria for the indicator, as shown in Table 2.

Table 2. Criteria for reservations.

1.	**Mean M≧4;**
2.	Standard deviation SD≦1;
3.	Quadratic difference Q≦0.5;
4.	Absolute value of the difference between the multitude (MO) and the mean (M) ≦ 1.

The results of the second round of questionnaires were subjected to exploratory factor analysis, in which the items were screened for the dimensions of professional knowledge, professional skills and professional attitudes. Using principal component analysis to remove items with low explanatory power. Also, a decision was made to remove indicators that did not meet the criteria. As shown in Table 3, they consisted of "items covering both common factors", "common factors with eigenvalues below 1", "factors below only two themes", and "question items with factor loadings of 0.5 or less". As noted above, if one of these four items was not met, it was deleted.

Table 3. Deletion criteria.

1.	**Question items with eigenvalue < 1;**
2.	Question items that cover both common factors;
3.	Only factors below the two question items are included;
4.	The question of too low for reliability.

4. Results and Discussion

4.1. Comprehensive discussion

The members of Delphi are experts in folklore and design of art, with a wealth of knowledge and experience. They have high levels of status and impact. Meantime, the level of positivity of both rounds of expert correspondence was 100 %, while the level of authority of the expert correspondence was 0.925 and 0.939, respectively. The evidence suggests that a team of experts can provide a strong guarantee of the credibility of the questionnaire. Based on the analysis and evaluation of the results of the first Delphi survey, a total of 52 items were deleted while 72 indicators were retained, which included 25 indicators of professional knowledge, 35 indicators of professional competence and 12 indicators of professional attitudes. Additionally, the mean values of |MO-M丨for the first and second questionnaire results in this study were 0.479 and 0.466, respectively. It is obvious that the mean values of |MO-M丨for the two rounds are both less than 1 while the value of the second round is smaller than the value of the first round. Meantime, the Kendall coordination coefficients for both rounds were greater than 0.5. This indicates that the opinions of the various experts in Delphi have reached a consensus. However, the results of the second Delphi questionnaire were updated by deleting 19 items but retaining 53 indicators, as shown in Table 3, which included 19 indicators of professional knowledge, 27 indicators of professional skills, and 7 indicators of professional attitudes. Overall, the mean of the results of the two rounds of the Delphi questionnaire was greater than 4, and the quartiles were less than 0.5, In addition, the cumulative explained variances of the three dimensions were 84.622 %, 85.633 %, and 78.395%, respectively, which were higher than 60 %. In addition, Cronbach's α values >0.75 for all three dimensions. This indicates that the common factors were reliable. Based on the results of the questionnaire and the statistical analysis of the data, the results of the two rounds are found to be effective. Nevertheless, a further step in optimisation was needed. Exploratory factor analysis and reliability analysis were handled and the reduction of indicator content was carried out. Using principal component method in factor analysis, a total of 32 indicators were deleted and 40 indicators were retained, which included 18 indicators in the professional knowledge, 15 indicators in the professional skills, and 7 indicators in the professorial attitudes. However, it further deletes the question items with too little confidence, whereby a total of 31 indicators are retained, comprising 12 indicators of professional knowledge, 12 indicators of professional skills, and 7 indicators of professional attitudes. In conclusion, the overall results of the factor analysis of the questionnaire are shown in Table 4.

Table 4. Results of the second revision of the questionnaire on Dwight's technique.

I. Professional Expertise	
1-1 Basic knowledge	1-2-5 Packaging Printing Knowledge
1-1-1 Core Fundamentals of Design	1-2-6 Branding Knowledge
1-1-2 Knowledge of design history and theory	1-2-7 Computer Basics

1-1-3 Packaging Design Methodology	1-2-8 Knowledge of new media technologies
1-1-4 Objects of study of folklore	1-2-9 New media communication knowledge
1-1-5 Surface characteristics of folklore	1-2-10 Media planning knowledge
1-2 Applied knowledge	1-2-11 Cultural Translation Knowledge
1-2-1 Frontiers of Design Theory	1-2-12 Information Visualization Knowledge
1-2-2 Design Research News	1-3 Knowledge of feasibility
1-2-3 The current situation and development trend of packaging design	1-3-1 Knowledge of Marketing
1-2-4 Status and development trends of folklore	1-3-2 Knowledge of Advertising
II. Professional Profile	
2-1 research skill	2-2-2 Ability to operate pixel drawing software
2-1-1 Excellent aesthetic ability	2-2-3 Ability to design graphics
2-1-2 A wealth of creative skills	2-2-4 Capable of packaging styling
2-1-3 Ability to design and position	2-2-5 Capable of packaging structure
2-1-4 Ability to plan packaging production processes	2-2-6 Ability to design fonts
2-1-5 Ability to analyze information data	2-2-7 Ability to design packaging and decorations
2-1-6 Ability to collect data	2-2-8 Ability to create brand image
2-1-7 Ability to categorize information	2-2-9 Ability to design digitally
2-1-8 possess the ability to think philosophically	2-2-10 Ability to test packaging
2-1-9 Ability to give multimedia presentations	2-2-11 Ability to design systematically
2-1-10 Ability to design from user experienc	2-2-12 Ability to familiarize yourself with the essentials of communication and coordination expertise
2-1-11 Possesses the ability to use the theories and methods of the humanities	2-4-7 Ability to compare different AI painting tools
2-1-12 Recognizing the capacity to design problems	2-3 applied skill
2-2 practical skill	2-3-1 Ability to conduct market research and studies
2-2-1 Ability to extract key information	2-3-2 Ability to prepare design specifications
III. Professional Literacy Component	
3-1 Personal Growth	3-2-3 Team player
3-1-1 Ability to take the initiative to participate in relevant seminars	3-2-4 Have a sense of integrity
3-2 Character Traits	3-3 interpersonal communication
3-2-1 Creative thinking	3-3-1 Ability to communicate effectively
3-2-2 sense of responsibility	3-3-2 Ability to build good synergy with team members

The professional knowledge was analysed through four times of continuous exploration of factors, which resulted in the extraction of a total of 12 indicators for the three subscales of professional knowledge，as shown in Table 5, subscale I contains 7 items 001, 003, 006, 021, 022, 023, 024, named “Theory of Design”; subscale II contains 3 items, 036, 037, 044, named "Application Knowledge", and subscale III contains 2 items, 032, 043, named "Feasibility Knowledge". Through the validity test, the eigenvalues were 5.528, 2.881, and 1.369, respectively, which cumulatively explained 81.478% of the variance. The professional skills were analysed through six continuously exploratory factor analyses, which extracted three subscales of professional skills with a total of 12 questions: subscale I contains 071, 073, 075, 079, 080, 088 with 6 items, named "Professional Practices"; subscale

II contains 083, 084, 094, 095 with 4 items, named "Applied Technology"; and subscale II contains 056, 057 with 2 items named " Development and Research in Design". The validity test with eigenvalues of 5.722, 2.548, and 1.604, respectively, which cumulatively explained variance was 82.288%. In addition, the subscales of professional attitudes were analysed through 3 times of continuous exploratory factor analysis, which extracted two subscales of professional attitudes with a total of 7 items: subscale I contains 4 items of 106, 110, 122, and 123, named " Interpersonal Communication"; subscale II contains 3 items, 103, 110 and 115, named " Applied Knowledge"; subscale III contains 2 items, 032 and 043, named " Personality Traits". The validity test has eigenvalues of 3.696 and 1.791, respectively, which cumulatively explains 78.395% of the variance. In addition, the eigenvalues of the dimensions were higher than 1.0 and the Cronbach's alpha coefficients for the professional knowledge, skills and attitudes were 0.844, 0.888, and 0.835, respectively. Nunnaly（2018）suggests that the Cronbach's alpha coefficient for acceptable reliability is above 0.7, while in this study the Cronbach's alpha coefficients for all constructs were > 0.8. Based on the above results, the evaluation scale of professional competence is found to be highly valuable.

Table 5. Factor analysis results.

Surface	Factor Nomenclature	Questionnaire Number	Total Number Of Questions	Sum Of The Squares Of The Loads	Eigenvalue (Math.)	Rotational Load Sum Of Squares	Explaining The Amount Of Variation	Cumulative Explained Variance
Specialized Knowledge	Design Theory	001	7	0.925	5.528	5.331	44.427	81.478
		003		0.871				
		006		0.873				
		021		0.924				
		022		0.814				
		023		0.831				
		024		0.814				
	Applied Knowledge	036	3	0.759	2.881	2.733	22.773	
		037		0.934				
		044		0.908				
	Knowledge Of Feasibility	032	2	0.839	1.369	1.713	14.278	
		043		0.575				
Specialized Skill	Professional Practice	071	6	0.661	5.722	4.755	39.628	82.288
		073		0.898				
		075		0.959				
		079		0.958				
		080		0.934				
		088		0.812				
	Applied Technology	083	4	0.929	2.548	2.677	22.305	
		084		0.575				
		094		0.763				
		095		0.780				
	Design And Development Research Ability	056	2	0.964	1.604	2.443	20.354	
		057		0.922				
Professional Attitude	Interpersonal Communication	106	4	0.822	3.696	2.857	40.813	78.395
		110		0.891				
		122		0.760				
		123		0.834				
	Personality Trait	103	3	0.825	1.792	2.631	37.582	
		110		0.926				
		115		0.866				

4.2. Comprehensive discussion

In response to the changes in society, the training of folklore packaging designers has become an important issue in order to increase the demand for folklore packaging designers. The scale of indicators of professional competence developed by this research not only provides an assessment for the selection of outstanding professionals in the enterprises, but it is also the focus of the educational programmes in design. The important indicators are divided into three constructs with a total of 31 indicators, as shown in Table 6, which are 12 indicators of professional knowledge, 12 indicators of professional skills and 7 indicators of professional attitudes. The results from the ranking of the mean values of the different dimensions show that the top five most important indicators of the professional knowledge are: knowledge of information visualisation, packaging design methodology, core fundamentals of design, current status and development trends of packaging design, and knowledge of advertising; The five most important indicators of professional skills are: the skill of graphic design, the skill of packaging structure, the skill of packaging decoration design, the

skill of operating pixel drawing software, and the skill of being familiar with the essentials of professional knowledge in communication; The top five most important indicators of professional attitudes are: creative thinking, teamwork, communication, synergy and integrity. The findings above illustrates that when carrying out learning and training programmes of folklore packaging designers, the order of learning and training can be organised according to the level of importance of the indicators.

Table 6. Ranking of importance of faceted indicators.

SURFACE	CONTENT OF THE INDICATORS	MEAN VALUE
Professional Expertise	Information Visualization Knowledge	5.33
	Packaging Design Methodology	5.27
	Core Fundamentals of Design	5.20
	The current situation and development trend of packaging design	4.93
	Knowledge of Advertising	4.87
	Knowledge of cultural translation	4.73
	Knowledge of design history and theory	4.73
	Status and development trends of folklore	4.73
	Knowledge of Marketing	4.60
	Design Research News	4.60
	Frontiers of Design Theory	4.53
	Computer Basics	4.47
Professional Skills Profile	Ability to design graphics	5.47
	Capable of packaging structure	5.33
	Ability to design packaging and decorations	5.33
	Ability to operate pixel drawing software	5.13
	Ability to familiarize yourself with the essentials of communication and coordination expertise	5.07
	Ability to apply packaging protection technology	5.00
	Ability to create brand image	4.93
	Ability to design digitally	4.73
	Ability to analyze information data	4.60
	Ability to conduct market research and studies	4.53
	Ability to collect data	4.53
	Ability to prepare design specifications	4.20
Professional Literacy Component	Creative thinking	5.60
	Team player	5.53
	Ability to communicate effectively	5.47
	Ability to build good synergy with team members	5.40
	Have a sense of integrity	5.33
	sense of responsibility	5.20
	Ability to take the initiative to participate in relevant seminars	4.80

5. Conclusions

This study is able to provide a professional competence evaluation scale for the cultivation of professionals in folklore packaging design. It provides a feasible benchmark for the professional upgrading of people working in folklore packaging. Also, the selection of talents by the enterprises and the arrangement of courses by the universities provide the evaluation criteria that should be followed. The results of the questionnaire show that the positive degree of the two rounds of expert correspondence is 100%, and the authority degree of the expert correspondence is 0.925 and 0.939 respectively, which indicates that the experts' professionalism is adequate. Furthermore, the mean values of |MO-M | for the first and second questionnaire results in this study were 0.479 and 0.466, respectively. Meantime, the Kendall coordination coefficients for both rounds were greater than 0.5. This indicates that the opinions of the various experts in Delphi have reached a consensus. Based on the factor analysis with the two rounds of Delphi survey, the mean of the results of the Delphi questionnaire was greater than 4, and the quartiles were less than 0.5, In addition, the cumulative explained variances of the three dimensions were 84.622 %, 85.633 %, and 78.395%, respectively, which were higher than 60 %. Also, Cronbach's α values >0.75 for all three dimensions. The assessment of the two rounds of questionnaires was therefore satisfactory. Overall, the evaluation scale of the professional competence for folklore packaging designers consists of 31 indicators in three dimensions after two rounds of Delphi questionnaire and exploratory factor analyses. professional knowledge with 12 indicators, professional skills with 12 indicators, and professional attitude with 7 indicators.

Author Contributions: conceptualization, H. Lin; validation, Q. Chen; writing—review and editing, M. Jean.

Funding: The authors gratefully acknowledge financial support from the Industry University Cooperative Education Projects of the Ministry of Education (202102100020; 202102391031; 2022H6031;231103231121958), and Undergraduate Education and Teaching Reform Research Project of Fujian Province (No. FBJG20220194); Key Project of Xiamen Social Science Federation (2024B31) and Key Issues of Xiamen Humanities and Social Sciences Research Centre (2024B31).

Acknowledgments: The authors gratefully acknowledge financial support from the Project of Science and Technology Department of Fujian Province(No. KL5022006), Industry-University Cooperative Education Projects of the Ministry of Education (No.202102100020; No.202102391031), Project of Educational Teaching Reform of Fujian Province(No.C150825),Undergraduate Education and Teaching Reform Research Project of Fujian Province (No. FBJG20220194).

Conflicts of Interest: The authors declare no conflict of interest.

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