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College student perceptions about the incorporation of cultural elements in fashion design

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Abstract

The cultural and creative industries have received considerable global attention in recent years; in particular, the close relationship between these industries and design has been identified. Because mysterious and attractive East Asian aesthetic are a crucial contemporary style, this study examined a fashion exhibition held in the New York Metropolitan Museum, which entitled "China: Through the Looking Glass" and conducted a literature review, scale design, survey and data analysis, and factor analysis about the incorporation of cultural elements in fashion design. Subsequently, the perceptions of college students with various educational backgrounds on several selected exhibits were identified and analyzed. The results were revealed that: (1) the research scale can be used as a reference for related design teaching and in the appraisal of fashion products in the design industry; (2) cultural connotations are more notable in design than the technical aspects; (3) compared with students of other backgrounds, students with a background in fashion design emphasized more on the technical and professional aspects and expressed a preference for design pieces with experimental qualities, such as those made with stiff materials and having exaggerated styles, and neutral and neat straight lines.

Keywords: Cultural and creative industry, Cultural elements, Design product, Fashion design, Fashion show, Design perception

Introduction

The origins of modern design lie in Renaissance art and succeeding eras such as European aestheticism in the nineteenth century; however, modern design was not clearly defined and adequately developed until the Bauhaus school in the twentieth century (Bony 2008). After this substantial period of accumulation, "design" is a broad field with a rich diversity of styles. From a domain perspective, fashion design is an essential aspect, and clothing is the first item which most people would associate fashion with. Personal clothing styles directly affect appraisals of fashion (Yen et al. 2015). The contemporary concept of "fashion" used to be referred to simply as popular trends of clothing. The fashion dictionary defines fashion as the "clothing styles, colors, or patterns accepted by the majority of people at a particular time and place" (Yen et al. 2014a, b).

One style that has been difficult to ignore in recent years is the "East Asian aesthetic" trend that has spontaneously swept the world, including the eastern cultural elements that convey an aesthetic of mystery, depth, and fantasy. Of all eastern cultures, Chinese culture is one of the most prominent and representative. Contemporary designers using elements of China's aesthetics draw not only from traditional clothing, but also from Chinese painting, calligraphy, and characters; furthermore, the rich history of Chinese culture and aesthetics that spans over thousands of years has ensured an expansive evolution of clothing. China's rich historical inheritance, including intangible philosophical thoughts, meanings and forms of Chinese characters, poetry, and ancient cultural artifacts, has become indispensable elements of contemporary design; by incorporating these elements in product design, an emerging industry of aesthetic design based on the integration of culture and aesthetic economy is created (Chiu et al. 2013). Thus, this study examined the "China: Through the Looking Glass" fashion exhibition held at the New York Metropolitan Museum of Art to explore the incorporation of cultural elements into fashion design. The purpose of this study was to develop an evaluation scale for the integration of cultural elements into fashion design, which can be used as a reference for future design instruction, product evaluation, and relevant future studies.

Literature review

Fashion design in cultural and creative industries

The cultural and creative industries facilitate the production of quality goods by supporting brand creation in the design industry; in which process, culture, fine art, and creativity are incorporated. In short, the cultural and creative industries produce creative design products on the basis of rich cultural heritage and artistic styles, prompting consumers to approve the brands as well as the content of quality products. Therefore, consumers are likely to purchase the goods because of the emotional resonance they experience (Wu 2007). The development of fashion is aligned with mainstream social developments, and represents a refined and innovative lifestyle, rather than the simple pursuit of luxury (Lin et al. 2012). The use of culture to establish market differentiation is an advantage that traditional industries can adopt; of all traditional industries, fashion industry is the most appropriate one to facilitate the development of fashionable lifestyles to satisfy public need of cultural consumption. For example, Taiwan is a multicultural and multiethnic country suitable for producing innovative and creative products. Effective integration of diversified local cultural characteristics into clothing styles facilitates developing new design elements on the basis of existing cultural inheritance. Chen and Chen (2011) pointed out, this practice improves design styles through innovation, assists with the development of the fashion industry by finding new opportunities, and increases the added-value of products.

Cultural elements incorporated in design

The most notable difference between cultural products and other products is cultural connotation. Specifically, cultural products draw upon various cultural elements as their creative source and facilitate the interpretation of distinctive meanings or appreciation of the culture. Furthermore, cultural and creative products are mass-produced commodities, rather than luxury goods (Yeh 2006). Cultural and creative products

that improve lifestyle through product design are products that have cultural meaning; designers infuse cultural, historical, and ethnic elements into their products to increase product value. Furthermore, consumers are able to reacquaint themselves with historical or lifestyle culture through these products, while simultaneously being involved in the passing-down of culture. The emphasis of cultural values and local features has already become a key aspect of the product development process (Gobe 2009; Koike 1992; Yeh 2006; Hsu and Hsieh 2009).

When individuals experience positive emotions, both the left and right hemispheres of the brain are activated. Sensory and cognitive studies on psychological and physical sensations, and the subsequent quantification of sensory perceptions, have indicated that product designers must consider psychological and physiological sensations (Berridge 2003; Lin 2003). Ashby and Johnson (2003) have also proposed the theory of product personality, which suggests that products possess physiological (e.g., features that meets the primary purposed of the design, functions, and other features) and psychological (e.g., personality and usability) dimensions. Notably, personality includes product aesthetics, associations, and perception conditions, whereas usability concerns consumer interaction. Overall, products possess two layers of meaning: the practical layer manages function and performance, and the other layer manages symbols, identification and emotions. Herein, attractiveness, beauty, and creativity are psychology qualities of products, and delicacy and engineering are physiological qualities of products. If a product possesses both functional (physiological) qualities and emotionally appealing psychological qualities, this product can satisfy consumers in both functional and emotional dimensions; moreover, if a product possesses cultural connotations in addition to the qualities of attractiveness, beauty, creativity, delicacy, and engineering, it can also be referred to as a quality good (Pogrebin and Trebay 2015; Yen et al. 2012, 2014a, b).

Elements of fashion design

An analysis of fashion design elements is critical in the examination of clothing styles, including ideas and concepts, creativity, material, color, form and construction, techniques, human elements, accessories, elements, and time. The basic presentation elements of clothing are lines, material, and color, of which in-depth understanding and effective usage are required for creating superior designs (Huang 2015; Jung 2011). In addition to satisfying the material needs of consumers, clothing should also echo their psychological reactions. Furthermore, fashion trends can be viewed as the understanding and acceptance of certain ideas in a group; thus, clothing is not only a reflection of daily ideologies, but also a creative product that demonstrates cultural style. Because the creation of contemporary clothing design aesthetics must integrate function, design content, and technical considerations, a designer should aim to create products that satisfy the demands of functionality in the physiological dimension and the demands of aesthetically appealing shapes in the dimension of psychology, so that the products can not only meet basic demands of usability, but also remonstrate added values such as desire-fulfilling pleasant use experience (Fornell and Larcker 1981; Jung 2011).

The basic composition of clothing includes material, structure, form, and function. Material is the framework of a clothing system; specifically, it effects change in the structure and form of clothing. Certain materials can even be interacting with consumer

senses directly and become a form of the product. Structure refers to the result of interconnection and mutually interaction between elements in the system, or the method of connection between diverse materials. Comprising color, line, and shape, form is the appearance of clothing developed on the basis of the combination of material and structure. Form can be considered a symbol or message. Finally, the function of clothing refers not only to an article's usage function, but also to the value of interaction between individuals and clothing in social relationships (Verganti 2013). Thus, the composition of clothing can be divided into two levels: the formal and technical level, and the cultural connotation level. In design, cultural connotation is a basic element of clothing, whereas form and technique are elements that help convey cultural connotations (Cao 2011).

Methods

Research framework

This study was based on the results of a literature review, and included the qualia characteristics of cultural and creative products as the six dimensions; namely, the form, technique, and cultural connotation elements of clothing, as well as overall performance. This study used an imagery survey, data analysis, and result inferences to conduct a factor analysis about the incorporation of cultural elements in fashion design.

Sample costumes

A spring exhibition piece that was based on the concept of Chinese influences on western fashion was selected from the Costume Institute at the Metropolitan Museum of Art in August (2015). Entitled "China: Through the Looking Glass," the exhibition was identified by Costume Institute curator, Andrew Bolton, as an inauthentic representation of China that was based on fantasy rather than reality (Bai 2005; Nagamachi 2010). In addition to showcasing traditional artifacts, the exhibition employed contemporary technology to produce a fantastical style similar to the imagery of Alice in Wonderland. For example, it was filled with mirrors, and included various pieces of Chinese-styled clothing, accessories, and couture ranging from the fifteenth century to the present day (Lin 2007). Inauthentic and fantasy tendentious of this exhibition cause of many of the works in the exhibition were displayed in different forms. However, for the present study, seven pieces of clothing that were displayed separately were selected because they embodied the incorporation of cultural elements in clothing design. Notably, the designs in each exhibit were inspired by a particular physical antique artifact from Chinese culture, namely Chinese arched shoes, snuff bottles, female figurines, and bronze mirrors, vessels, pots, and bells. Each piece and its corresponding antique are shown in Table 1.

Research instrument

This study conducted a literature review and data analysis of relevant studies, and used a research framework for the incorporation of cultural elements into fashion design as its basis. The evaluation items were then expanded and compiled by defining the evaluation dimensions and secondary questions; hence, an evaluation scale suitable for measuring creative and cultural fashion products was developed. The dimensions and evaluation questions are outlined in Table 2.

Table 1 Sample costumes

Code/name	Image	Costume description
P1. Costume converted from arched shoes		Fabrics with different textures are stitched in a stack, including pink embroidery, gold thread, an auspicious bird pattern, a cloud-patterned belt, and an above-elbow sleeve. The gap in the hem of this garment is similar to the concave shape of arched shoes
P2. Costume converted from snuff bottles		A long cut-out shoulder one-piece dress that shapes like a container, with a design similar to patterns painted inside traditional snuff bottles. The meticulously embroidered surface of the costume features ancient Chinese architecture, flowers, and other decorative patterns in various colors
P3. Costume converted from female figurines		A one-piece long-sleeved dress, with a style adapted from dancing figurines. The collar is presented with modern lines, while the sleeves are comparatively shorter to match normal wear. The surface of the garment is embroidered with floral patterns using gold thread
P4. Costume converted from bronze mirrors		A black silk straight-collared one-piece A-line long dress with puff sleeves. It includes a chest decoration with three arcs, similar to a necklace, and a skirt fashioned out of a bronze mirror-textured material to connect different fabrics. The bronze mirror pattern is scattered asymmetrically on the surface of the upper skirt

Table 1 continued

Code/name	Image	Costume description
P5. Costume converted from bronze vessels		A two-piece garment combination. The primary incorporation of cultural characteristics is reflected in the top garment, which is a neutral style short-sleeved jacket layered with three-dimensional wave patterns reminiscent of bronze vessels. The design and metallic colors of the garment provide a futuristic feel
P6. Costume converted from bronze pots		A two-piece garment combination. The primary incorporation of cultural characteristics is reflected in the top garment, which is a neutral Chinese-style single-breasted top with tall shoulder pads and fur sleeves sewn together with other materials. The design is a distinct presentation of the conflict between order and escape from tradition
P7. Costume converted from bronze bells		A wine-colored one-piece long-sleeved short dress. The surface pattern comprises a bell motif that extends from the top to the umbrella-shaped skirt. A single color was used in the stitching and embroidery on the surface of the garment. A western-style bow attached to the collar invokes a sense of fusion between Chinese and western styles

Experimental design and data collection

This study had two stages of the investigation. Stage 1 were reliability analysis of measuring scales and exploratory analysis of factors. This stage involves a preliminary verification of the measuring scales used in this study. Stage 2 were proposed measurement model by confirmatory factor analysis (CFA). The authors conducted the confirmatory factor analysis by using SPSS and Amos of the Statistical Data Analysis software.

This study involved the fashion design survey through the cultural elements into fashion design questionnaire. College students in Taiwan with a basic understanding and familiarity with Chinese cultural artifacts and design were recruited for this study, and were recruited to participate in the survey through purposive sampling. This study was conducted during design-related classroom courses. The students were invited to participate as subjects and agreed to follow the experimental procedure. The purpose of

Table 2 Quantitative scale and evaluation of the incorporation of cultural elements into fashion design

Dimension	Evaluation questions
Attractiveness	A0. This costume is charming
	A1. This costume possesses an appealing story or meaning
	A2. This costume is able to convey cultural connotation
	A3. This costume is interesting
	A4. This costume evokes memories of daily life
	A5. This costume is fashionable
	A6. This costume possesses a positive meaning
Beauty	B0. This costume possesses aesthetic beauty
	B1. This costume has a positive shape ratio
	B2. This costume conveys a sense of contemporariness
	B3. This costume uses color appropriately
	B4. This costume exhibits an ingenuous use of materials
	B5. This costume was designed based on the original characteristics of concrete items (e.g., animals, plants, things)
	B6. This costume has an exceptional tactile feel
Creativity	C0. This costume is creative
	C1. This costume is novel
	C2. This costume is original or innovative
	C3. This costume feels special
	C4. This costume features an ingenuous manner of wearing
	C5. This costume meets the needs of various users
	C6. This costume is multifunctional
Delicacy	D0. This costume is refined
	D1. This costume has an elegant structure
	D2. This costume has a favorable detailed design
	D3. This costume features fine surface ornamentation
	D4. This costume has fine and exquisite accessories
	D5. This costume has a high quality texture
	D6. The overall design of this costume is refined
Engineering	E0. This costume is ergonomic
	E1. This costume possesses practical functionality
	E2. This costume is easy to wear
	E3. This costume does not accidentally expose the wearer easily
	E4. This costume allows for convenient movement
	E5. This costume appears to be durable
	E6. This costume uses professional or cutting-edge production techniques
F. Overall performance	F1. I like this piece
	F2. This piece is a model of a creative and cultural product
	F3. This piece is well designed

the experiment was explained to the subjects and slides showing the 7 sample costumes was juxtaposed with a slide of their corresponding description and evaluation questions. Each subject completed the experiment within 20 min. A total of 194 individuals, comprising 86 students who were enrolled in fashion-related programs and 108 who were enrolled in design-related programs, of which 86% were female. The mean age of the sample was 21 years, completed an online questionnaire. The questionnaire employed a 7-point Likert scale and consisted of 38 questions that retrieved basic personal

information and students' opinions regarding various dimensions of each fashion piece. Subsequently, a detailed review of the completed surveys was conducted, through which blank surveys or surveys with an excessive number of unanswered questions were excluded from subsequent analysis. In total, 192 valid surveys were returned.

Results and discussion

Survey reliability and validity analysis

The scale used in this study comprised six dimensions: attractiveness, beauty, creativity, delicacy, engineering, and overall performance. Cronbach's α reliability coefficient was used to determine the reliability of the questionnaire on each of these dimensions. Overall, scale reliability was .98 ($p < .001$), and the content reliability of each dimension were all greater than .9 ($p < .001$); this indicated that each dimension and the questionnaire as whole were sufficiently reliable. Additionally, these results are consistent with (The Metropolitan Museum of Art 2015) proposal that scales with appropriate reliability should exhibit a reliability coefficient greater than .80 for the overall scale and reliability coefficients greater than .70 for each dimension. The assessment of the content validity of each dimension indicated that the factor loadings of all six dimensions fell between .72 and .97, which is consistent with (Chen and Wang 2011) recommendation that the standard values should be greater than .5. Moreover, the variance of each dimension was between 74 and 92%. Thus, the overall results met relevant standards, and demonstrated that this research instrument was feasible. The reliability and validity analysis results are summarized in Table 3.

Analysis of correlation coefficients of the questionnaire on cultural elements incorporated into fashion design

The Pearson product-moment correlation coefficient was used to evaluate the correlation between each dimension and the overall scale. The results indicated that a significant correlation existed between each dimension, and between each dimension and the overall scale. The correlation coefficient analysis results are presented in Table 4.

Proposed measurement model

In this phase, the authors proposed measurement model of cultural elements into fashion design. The data of this study were subjected to delete the questions' factor were less than .85 (base on Table 3), and to reduce the number of items as a scale to analyze fashion design. Confirmatory factor analysis (CFA) was conducted to analyze five latent variables (attractiveness, beauty, creativity, delicacy and engineer) of the "cultural elements into fashion design scale."

Through the adjustment of various dimensions of the model by the deletion of some questions, this study established 29 measurement variables for the five dimensions. The final model and model verification are shown in Fig. 1. According to the structure of the tests used by Chen and Wang (2011) and Jung (2011), the model fit test results for this study showed that the indicators of this model were almost always at or close to an acceptable level. This indicated that the overall structure of this research as well as its theoretical structure had a good fit with the empirical data.

Table 3 The reliability and validity of questionnaire (N = 192)

Dimension	Code	Cronbach *α*	Factor	Variance explained (%)
A. Attractiveness	A0	.958	.909	80.326
	A1		.912	
	A2		.907	
	A3		.883	
	A4		.834	
	A5		.923	
	A6		.903	
B. Beauty	B0	.964	.931	82.767
	B1		.946	
	B2		.885	
	B3		.936	
	B4		.942	
	B5		.835	
	B6		.888	
C. Creativity	C0	.955	.942	79.846
	C1		.945	
	C2		.928	
	C3		.915	
	C4		.944	
	C5		.785	
	C6		.775	
D. Delicacy	D0	.982	.963	90.263
	D1		.942	
	D2		.965	
	D3		.946	
	D4		.903	
	D5		.961	
	D6		.969	
E. Engineering	E0	.939	.863	73.506
	E1		.901	
	E2		.919	
	E3		.722	
	E4		.900	
	E5		.884	
	E6		.795	
F. Overall performance	F1	.955	.956	91.886
	F2		.955	
	F3		.964	

The overall model fit verification results showed that the ratio between the Chi square value and the degrees of freedom was between 1 and 5 ($\times 2/df = 3.392$) which was within the acceptable range. Other index values showed that they all complied or were close with the testing standards (RMR = .068 < .08; PGFI = .573 > .5; NFI = .9 = .9; RFI = .9 = .9; IFI = .905 > .9; NNFI (TLI) = .9 = .9; CFI = .905 > .9; PNFI = .798 > .5; PCFI = .829 > .5; RMSEA = .1). Overall, all index values in the model reached or were close to the acceptable levels. This showed that the model had a good fit in terms of the theoretical and empirical data structure.

Table 4 Internal relationship between the dimensions and the scale (N = 192)

Dimension	M	SD	A.	B.	C.	D.	E.	F.	All
A. Attractiveness	4.623	.9239	1						
B. Beauty	4.620	.8794	.931**	1					
C. Creativity	4.443	.9370	.908**	.907**	1				
D. Delicacy	4.914	.9512	.866**	.920**	.850**	1			
E. Engineering	4.151	.8260	.780**	.817**	.824**	.693**	1		
F. Overall performance	4.564	1.0186	.896**	.918**	.901**	.890**	.776**	1	
All	4.551	.8570	.957**	.976**	.958**	.928**	.867**	.946**	1

** Level of significance is .01; two-tailed

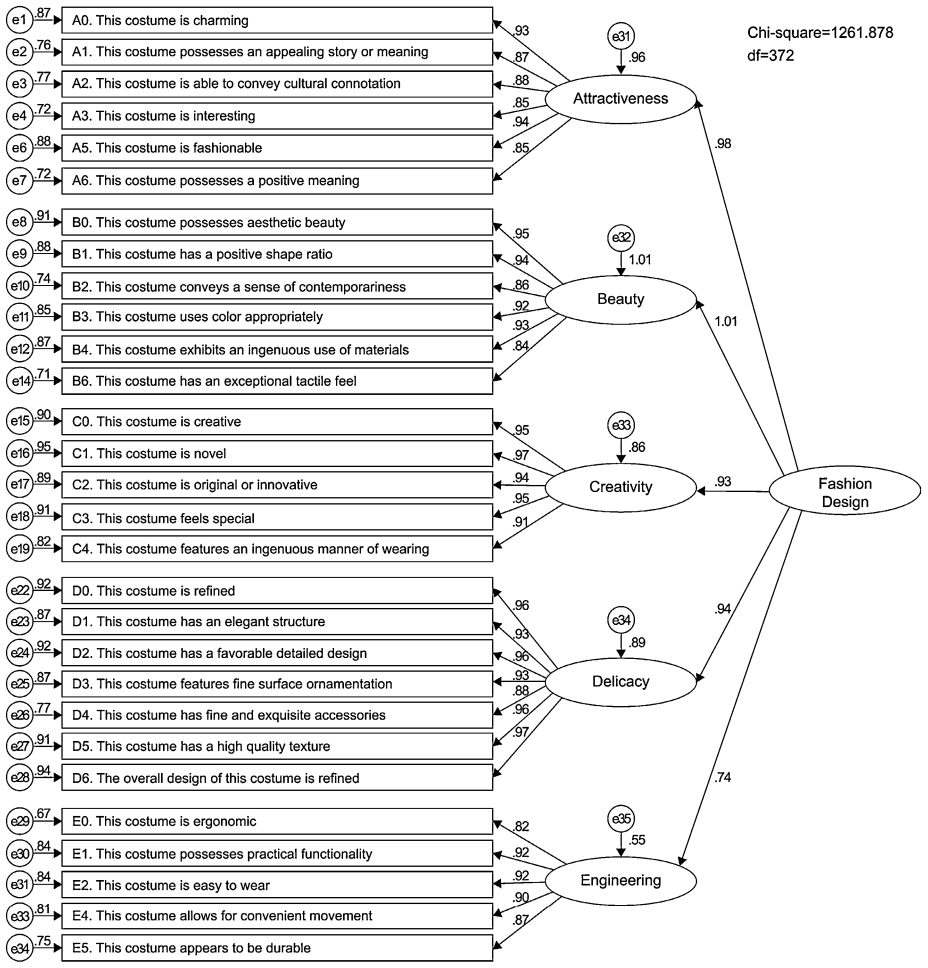

Fig. 1 The model of cultural elements into fashion design

Effects of different educational backgrounds

This study conducted an independent samples *t* test on each dimension of the survey for respondents of various educational backgrounds. The analysis of the results revealed that the respondents with fashion design backgrounds exhibited a higher average sample value compared with the respondents who had other design backgrounds. A Levene's

test for equality of variances was subsequently performed and determined no significant difference between the results generated from these two respondent groups in all dimensions (F = .077, .206, .002, .007, .633, .000; p > .05), indicating that there was no significant difference in the discreteness of the two respondent groups. This equal variance t test showed that the test results reached significance only in the engineering dimension. In short, the two respondent groups only exhibited notable diversity in their respective opinions on the engineering dimension; the two groups held consistent opinions towards the attractiveness, beauty, creativity, delicacy, and overall performance of the seven artifacts examined (Table 5).

To perform an additional analysis according to the preceding results, this study conducted another independent samples t test on all question of the survey. Results of this equal variance t test indicated that significance was achieved in only seven questions: A4 (attractiveness dimension); C5 and C6 (creativity dimension); E1, E2, and E4 (engineering dimension); and F1 (overall performance dimension). Similar to the previous t test, the engineering dimension exhibited the greatest variance. These results suggested that respondents with a background in fashion design tend to emphasize the technical and professional dimension, as well as different aspects of creativity, compared with those of other design groups. Furthermore, the majority of questions regarding beauty and delicacy exhibited virtually no difference between the two groups, signifying that the perceptions of the aesthetics and concrete structures of the products are consistent between the two groups. Table 6 shows the t test results of the survey questions.

Finally, this study used the average values of the F1, F2, and F3 questions (overall performance dimension) to conduct a third independent samples t test on the educational backgrounds of the participants. The results indicated that each question reached a level of significance for P5 and P6; in both cases, students with fashion design backgrounds indicated higher scores than did those of other design backgrounds, suggesting that these two pieces were more well-received by students with fashion design backgrounds. Further observation of these two pieces revealed a marked difference between them and the other five pieces, namely that they were design pieces that possessed greater

Table 5 T test of dimensions of the questionnaire of different learning background (N = 192)

Dimension	Learning background	M	SD	F	t
A. Attractiveness	Background in other design	4.5337	.91683	.077	−1.493
	Background in fashion design	4.7333	.92592		−1.492
B. Beauty	Background in other design	4.5637	.87964	.206	−.975
	Background in fashion design	4.6882	.87926		−.975
C. Creativity	Background in other design	4.3972	.93925	.002	−.743
	Background in fashion design	4.4983	.93667		−.743
D. Delicacy	Background in other design	4.8554	.97488	.007	−.939
	Background in fashion design	4.9850	.92167		−.944
E. Engineering	*Background in other design*	*4.0337*	*.79563*	*.633*	*−2.208**
	Background in fashion design	*4.2957*	*.84429*		*−2.194**
F. Overall Performance	Background in other design	4.4555	1.02301	.000	−1.645
	Background in fashion design	4.6977	1.00296		−1.649

Italics for the words of questions with significant differences; two-tailed: * p < .05

Table 6 T test of dimensions of the questionnaire of different learning background (N = 192)

Dimension	Code	Learning background	M	SD	F	t
A. Attractiveness	A0	Background in other design	4.7049	1.02035	.004	−1.428
		Background in fashion design	4.9153	1.00882		−1.430
	A1	Background in other design	4.8100	1.01758	.161	−1.527
		Background in fashion design	5.0316	.97788		−1.533
	A2	Background in other design	4.9542	.98867	.117	−1.061
		Background in fashion design	5.1080	1.01204		−1.058
	A3	Background in other design	4.5526	1.00264	.061	−.426
		Background in fashion design	4.6146	1.00517		−.426
	A4	*Background in other design*	*3.8854*	*1.13491*	*.058*	*−2.429**
		Background in fashion design	*4.2874*	*1.14715*		*−2.426**
	A5	Background in other design	4.4704	1.01705	.380	−1.018
		Background in fashion design	4.6179	.97519		−1.023
	A6	Background in other design	4.3585	1.05794	.030	−1.311
		Background in fashion design	4.5581	1.03889		−1.313
B. Beauty	B0	Background in other design	4.7062	.98971	.010	−.874
		Background in fashion design	4.8289	.93891		−.879
	B1	Background in other design	4.5620	.93963	.243	−.931
		Background in fashion design	4.6894	.94563		−.931
	B2	Background in other design	4.3706	.96262	.377	−.092
		Background in fashion design	4.3837	1.01188		−.091
	B3	Background in other design	4.6321	.94369	.177	−1.037
		Background in fashion design	4.7757	.96829		−1.034
	B4	Background in other design	4.7412	.95844	.005	−.855
		Background in fashion design	4.8588	.93267		−.858
	B5	Background in other design	4.5714	1.04867	.112	−.974
		Background in fashion design	4.7176	1.01631		−.977
	B6	Background in other design	4.3625	1.00227	.361	−1.456
		Background in fashion design	4.5631	.87964		−1.476
C. Creativity	C0	Background in other design	4.7318	1.04378	.451	−.106
		Background in fashion design	4.7475	.98529		−.107
	C1	Background in other design	4.7264	1.06378	.699	−.008
		Background in fashion design	4.7276	.98503		−.008
	C2	Background in other design	4.7736	1.08113	2.162	.261
		Background in fashion design	4.7342	.98516		.264
	C3	Background in other design	4.8895	1.09992	1.560	.902
		Background in fashion design	4.7542	.94549		.916
	C4	Background in other design	4.5013	1.05094	.008	−.226
		Background in fashion design	4.5349	.98590		−.228
	C5	*Background in other design*	*3.6900*	*1.08912*	*.106*	*−2.513**
		Background in fashion design	*4.0914*	*1.11412*		*−2.507**
	C6	*Background in other design*	*3.4677*	*1.10684*	*.064*	*−2.663***
		Background in fashion design	*3.8987*	*1.12547*		*−2.658***
D. Delicacy	D0	Background in other design	4.9488	1.06343	.132	−1.149
		Background in fashion design	5.1196	.97431		−1.159
	D1	Background in other design	4.7965	1.02504	.336	−.201
		Background in fashion design	4.8256	.95879		−.203
	D2	Background in other design	4.8235	1.05947	.229	−.875
		Background in fashion design	4.9535	.97716		−.883

Table 6 continued

Dimension	Code	Learning background	M	SD	F	t
	D3	Background in other design	5.0984	.97118	.036	−.768
		Background in fashion design	5.2060	.95834		−.769
	D4	Background in other design	4.5849	1.01371	.122	−1.598
		Background in fashion design	4.8140	.95394		−1.609
	D5	Background in other design	4.8248	1.04054	.154	−1.057
		Background in fashion design	4.9784	.95002		−1.067
	D6	Background in other design	4.9111	1.02457	.031	−.595
		Background in fashion design	4.9983	.99398		−.597
E. Engineering	E0	Background in other design	4.2412	.96031	.498	−1.740
		Background in fashion design	4.4850	.97219		−1.738
	E1	*Background in other design*	*3.6173*	*1.07693*	*.025*	*−2.477**
		Background in fashion design	*3.9967*	*1.02852*		*−2.489**
	E2	*Background in other design*	*3.9434*	*.89977*	*.205*	*−2.053**
		background in fashion design	*4.2209*	*.96956*		*−2.037**
	E3	Background in other design	4.6388	.83281	.051	−.922
		Background in fashion design	4.7542	.89728		−.915
	E4	*Background in other design*	*3.6995*	*.98382*	*.215*	*−2.426**
		Background in fashion design	*4.0432*	*.96719*		*−2.430**
	E5	Background in other design	3.8760	.95559	.582	−1.852
		Background in fashion design	4.1246	.88574		−1.866
	E6	Background in other design	4.2197	.98880	.016	−1.587
		Background in fashion design	4.4452	.96727		−1.590
F. Overall Performance	*F1*	*Background in other design*	*4.3167*	*.98640*	*.325*	*−2.273**
		Background in fashion design	*4.6462*	*1.01341*		*−2.267**
	F2	Background in other design	4.4973	1.11762	.267	−1.380
		Background in fashion design	4.7176	1.07754		−1.385
	F3	Background in other design	4.5526	1.10886	.860	−1.132
		Background in fashion design	4.7292	1.03179		−1.141

Italics for the words of questions with significant differences; two-tailed: * $p < .05$, ** $p < .01$

experimental qualities and were thus less likely to be worn as actual clothing. The data analysis results for this final t test are as summarized in Table 7.

Conclusion

This study reached the following results through conducting a questionnaire survey and associated validation analysis. The final conclusions are as presented below:

First The reliability, validity, and correlation coefficient analysis results met the test standards, and The model of Confirmatory factor analysis(CFA) had a good fit in terms of the theoretical and empirical data structure. Therefore, the model for the incorporation of cultural elements in fashion design is feasible, and thus it can be used in related design instruction or the industrial appraisal of fashion design. From the overall model, attractiveness and beauty of fashion design of the most significant, and engineering is the followed factor to be considered.

Second Conclusions related to the comparison of participants with diverse educational backgrounds are described as follows:

Table 7 T test of the dimension of overall performance (N = 192)

Sample	Code	Learning background	M	SD	F	t
P1	F1	Background in other design	3.7264	1.61265	2.432	−1.734
		Background in fashion design	4.1163	1.46664		−1.751
	F2	Background in other design	4.1415	1.55189	1.533	−1.129
		Background in fashion design	4.3837	1.38197		−1.143
	F3	Background in other design	4.0943	1.54012	1.217	−.591
		Background in fashion design	4.2209	1.39243		−.597
P2	F1	Background in other design	4.4340	1.46722	1.489	−1.026
		Background in fashion design	4.6395	1.26410		−1.042
	F2	Background in other design	4.5849	1.43340	1.613	−1.168
		Background in fashion design	4.8140	1.24155		−1.186
	F3	Background in other design	4.6226	1.50841	5.359	−.783
		Background in fashion design	4.7791	1.19214		−.803
P3	F1	Background in other design	4.9057	1.60076	.531	.194
		Background in fashion design	4.8605	1.60267		.194
	F2	Background in other design	4.8302	1.55821	1.504	−.087
		Background in fashion design	4.8488	1.36784		−.088
	F3	Background in other design	4.8491	1.49789	.068	.338
		Background in fashion design	4.7791	1.33197		.342
P4	F1	Background in other design	4.9434	1.58463	2.141	−.261
		Background in fashion design	5.0000	1.38054		−.264
	F2	Background in other design	4.7830	1.38705	.018	.138
		Background in fashion design	4.7558	1.32786		.138
	F3	Background in other design	5.0000	1.43427	.644	.854
		Background in fashion design	4.8256	1.37363		.858
P5	*F1*	*Background in other design*	*3.4151*	*1.59085*	*1.419*	*−4.644***
		Background in fashion design	*4.4419*	*1.43572*		*−4.694****
	F2	*Background in other design*	*3.9717*	*1.58239*	*.698*	*−2.813***
		Background in fashion design	*4.5814*	*1.37597*		*−2.854***
	F3	*Background in other design*	*4.0189*	*1.71259*	*7.785*	*−3.182***
		Background in fashion design	*4.7209*	*1.24287*		*−3.287***
P6	*F1*	*Background in other design*	*3.6321*	*1.53266*	*.066*	*−3.107***
		Background in fashion design	*4.3256*	*1.54495*		*−3.104***
	F2	*Background in other design*	*4.1415*	*1.48285*	*.021*	*−2.109**
		Background in fashion design	*4.5930*	*1.46631*		*−2.111**
	F3	*Background in other design*	*4.0660*	*1.55085*	*.007*	*−2.282**
		Background in fashion design	*4.5698*	*1.48356*		*−2.292**

Italics for the words of questions with significant differences; two-tailed: * p < .05, ** p < .01, *** p < .001

1) The evaluation of factors that influence the incorporation of cultural elements into fashion design indicated that the students with an educational background in fashion design place greater importance on whether a fashion piece evokes memories of daily life, whether a fashion piece fits the needs of different users, and whether a fashion piece is multifunctional, practical, easy to wear, and provides ease of motion than the students with other design backgrounds. Furthermore, the fashion design students typically offered a more favorable opinion for the selected pieces compared with other design students, with the physiological engineering dimension exhibiting the greatest difference. Therefore, it is evident that fashion design students place greater

emphasis on the technical and professional aspects of these pieces. Finally, fashion design students emphasized different aspects of creativity than those highlighters by other design students. However, for the aesthetic and delicacy dimensions, no significant difference was identified between the two groups, showing consistency in their opinions on the aesthetic and structural features of these fashion pieces.

2) According to the answers of the two respondent groups to questions F1, F2, and F3, only those of P5 and P6 exhibited significant between-group differences; specifically, these two pieces were highly regarded by design students. Further observation of P5 and P6 demonstrated that the most substantial difference between these two pieces and the other five was that they were the most unlikely to be worn in real life; as they featured stiff materials, exaggerated styles, and neutral and sharp lines, they had a greater degree of experimental, rather than practical, qualities.

The contemporary fashion scene has been swept by a trend of East Asian aesthetic; because "China: Through the Looking Glass" was presented as the theme of a Met Gala New York fashion event, Asian designers have rapidly emerged on the international stage (Hsu 2004). The long and rich history of Chinese culture is the greatest advantage of ethnic Chinese people. Creativity and beauty appeal to the psychological dimension of the consumers and are the key to design products that exhibit the added value of cultural connotations as well as satisfy the physiological needs. The conclusions of this study can be used as a reference for educational organizations and other design-related organizations. Furthermore, this study can be referred to for industry appraisals of fashion designs, which will assist firms in improving their cultural creativity and industry competitiveness.

Authors' contributions

Both authors work together in questionnaire distribution, and first author work in conception, implementation, write and apply the proposed methods in this paper then both authors read and approved the final manuscript.

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Competing interests

All authors declare that they have no competing interests.

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