Application Model Analysis of Design Psychology in Digital Media Design

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Abstract. With the comprehensive popularization of digital media technology in China, digital media technology has become the main popular trend in art and design. Design psychology, a crucial aspect of design thinking, has also received significant attention from many design professionals. This article is based on digital media technology and analyzes the three basic elements of design psychology: color, graphics, and composition. This study aims to evaluate the applicability of design psychology in digital media design, focusing on its impact on color, graphics, and composition, and exploring seven different design methods to improve the quality of digital media design.

Keywords: Digital media technology, Design psychology, Design.

1 Introduction

With the rapid development of science and technology, it has brought us a new form of design - digital media technology design. Designers have integrated their understanding of design psychology with this technology to create further works of art[1]. This study is based on a questionnaire survey of designers, design students, and design audiences to investigate the impact of design psychology on digital media design. The questionnaire reliability and validity tests are conducted, and the correlation analysis with the background dimensions of the respondents is conducted. Finally, multiple linear regression analysis is conducted to investigate the shortcomings of design psychology in digital media design and improve design ability[2].

2 Research object and methodology

2.1 Headings, tables and figures

The research object of this article is the relevant population who have an understanding of the design. After publishing the survey questionnaire through questionnaire star, the survey was conducted anonymously. Mainly distributed through social media, class groups, and design software. A total of 245 questionnaires were distributed, and after screening out invalid questionnaires, 210 valid questionnaires were received, with males accounting for 57.1% and females accounting for 42.9%. The questionnaire recovery rate was 100%, and the effectiveness rate was 85%.

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2.2Research method

This article mainly uses the questionnaire survey method to collect sample data, and uses SPSS 23.0 statistical analysis software for data analysis.

3 Data analysis

3.1 Questionnaire reliability test

The research object of this article is the relevant population who have an understanding of the design. After publishing the survey questionnaire through questionnaire star, the survey was conducted anonymously. Mainly distributed through social media, class groups, and design software. A to in order to understand the reliability of the questionnaire data, Cronbah was used α The coefficient is used to analyze the reliability of seven situations in design psychology, including only considering color, only considering composition, only considering pattern, considering color and composition, color and pattern, composition and pattern, and considering composition, color and pattern (hereinafter referred to as T1, T2, T3, T4, T5, T6, T7). The results are as follows, as shown in Table 1. According to the results, Cronbah α The coefficient is between 0.8 and 0.9, indicating that the reliability of the survey data is relatively ideal.

Table 1. Reliability statistics.

Reliability statistics	
Cronbah Alpha	Number of items
.863	7

3.2 Questionnaire validity test

In order to test the structural validity of the questionnaire, this article conducted KMO test and Bartlett sphericity test on the 7 relevant factors in the questionnaire, as shown in Table 2, with a p-value of 0.000 ($p<0.05$), indicating that the questionnaire data is suitable for factor analysis. The KMO value is 0.878, which is greater than 0.8, indicating good validity of the questionnaire. According to the common factor display, the extracted common factor is greater than 0.8, indicating that the extracted common factor can better explain the data in the questionnaire.

Table 2. KMO and Bartlett tests**.**

KMO and Bartlett tests		
KMO	.878	
Bartlett sphericity detection	Approximate chi square	640.462
	Degrees of Freedom	21
	Significance	.000
	Initial	Extract
T1	1.000	.543
T2	1.000	.532
T3	1.000	.843
T4	1.000	.508

T5	1.000	.519
T6	1.000	.472
T7	1.000	.982

3.3 Analysis of the Improvement of Digital Media Design Works by Seven Application Methods of Design Psychology

Based on 7 different application methods of design psychology, the Likert 5-level scale was used to measure three situations: important, average, and unimportant. The importance of seven design scenarios in digital media technology design is analyzed by the respondents, as shown in Table 3.

Table 3. KMO and Bartlett tests**.**

	Very important	Important%	General%	Not important%	Very unimportant	Mean value
T1	32.4	30.0	17.6	8.6	11.4	3.63
T2	33.3	35.7	18.1	6.7	6.2	3.71
T3	32.9	42.9	12.9	5.7	5.7	3.61
T4	32.9	29.5	20.0	10.5	7.1	3.70
T5	31.0	30.0	22.9	8.6	7.6	3.68
T6	33.3	28.6	16.7	10.0	11.4	3.62
T7	37.1	29.5	17.1	10.5	5.7	3.82

According to the data, in the analysis of the importance of seven design psychology application methods, T7- considering color, composition, and pattern at the same time - has the highest importance, with a mean of 5.41. T3 only considers the importance of pattern elements, with an average of 3.18. In digital media design, considering the three elements of color, composition, and pattern simultaneously has the highest degree of improvement for digital media design works, while considering the pattern element alone has the worst effect, which is not significant for improving digital media design works[3].

3.4 Multivariate correlation analysis between the application of design psychology and the characteristics of respondents

Conduct a correlation analysis on the improvement of digital media design and the background related characteristics of the respondents through seven application methods of design psychology. The Pearson correlation coefficient is used to represent the strength of the correlation relationship, as shown in Table 4.

Table 4. Correlation analysis of background features**.**

	Gender	Age	Major	T1	T2	T3	T4	T5	T6	T7
Gender	1									
Age	-0.16 1.402	1								
Major	-.081 1.003	-.019 1.393	1							
T1	.044 1.287	.019 1.395	-.150 .428	1						
T2	.004 1.420	.044 1.345	-.004 1.420	.646 .000	1					

T3	.054 1.220	-.076 1.046	-.096 .871	.682 .000	.483 .000	1				
T4	-.070 1.098	-.071 1.400	-.139 .508	.607 .000	.402 .000	.386 .000	1			
T5	-.067 1.123	.061 1.403	-.035 1.332	-.577 -.000	.383 .001	.357 .000	.501 .000	1		
T6	-.075 1.058	.023 1.384	-.122 .645	.594 .000	.381 .000	.423 .000	.388 .000	.414 .000	1	
T7	-.063 1.150	.004 1.420	-.016 1.049	.638 .000	.481 .000	.459 .000	.436 .000	.458 .000	.420 .000	1

The results showed that the background characteristics of the respondents, such as gender, age, major, and 7 application methods of design psychology, were analyzed for overall correlation with the improvement of digital media design. The correlation coefficient between major and T7 was -. 016, and showed a significance level of 0.05, indicating a significant negative correlation between major and T7. It can be seen that respondents in design majors attach greater importance to the application of design psychology in digital media technology.

3.5 Multiple linear regression analysis of various factors and design psychology in digital media design

Based on the survey and analysis above, this article applies multiple linear regression analysis, as shown in Tables 5 and 6, to integrate the common factors that affect the application of design psychology in digital media technology design. There are eight factors, namely major, T1, T2, T3, T4, T5, T6, and T7. Through data analysis, the weight of each factor is obtained. The higher the weight, the greater the impact of the item on design psychology in digital media technology design. Conversely, the impact is minimal[4].

Table 5. Anova**.**

Model	Sum of squares	Degrees of Freedom	Mean square.	F	Significance
Return	15.721	6	2.619	3.321	.003
Residual	988.860	1254	.789		
Total	1004.571	1269	.797		

The results showed that the regression model in this study had statistical significance, with F (6102)=3.321, P<0.001, indicating a linear correlation between the dependent variable and the independent variable. The null hypothesis for this test is the multiple correlation coefficient R=0. At the same time, it also indicates that compared to null models, incorporating independent variables helps predict the dependent variable.

Table 6. Coefficient**.**

Model	Unstandardized coefficients		Standardization coefficient	t	Significance	Correlation		
	B	Standard error	Beat			Zero order	Bias	Part
7 elements (constant)	1.410	.122		11.527	.000			
T1	.0.49	.028	.157	1.732	.085	-.004	.002	.001
T2	.001	.032	.002	.022	.983	-.096	.002	.001
T3	-.084	.052	-.225	-1.611	.109	-.150	-.133	-.111

T4	-.034	.030	-.101	-1.138	.256	-.095	.002	.001
T5	.035	.030	.103	1.175	.242	-.139	-.080	-.078
T6	-.018	.026	-.058	-.673	.502	-.035	-.082	.081
T7	.004	.031	.102	.132	.895	-.122	-.047	-.046
Major	.000	.061	.000	.005	.043	.077	-.001	.000

The results show that the constant term a=1.410. Set the regression coefficients of each item to X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, and bring them into the equation. The regression equation is:

$$Y=1.410+0.049X_1+0.001X_2+-0.084X_3+-0.034X_4+-0.035X_5+-0.018X_6+0.004X_7+0.000X_8$$

From this, it can be seen that the P-values of T1, T2, T3, T4, T5, T6, T7, and the professional partial regression coefficient tests of the respondents are all<0.05. At a test level of a=0.05, it can be considered that their partial regression coefficients are not 0 and have statistical significance, which can be included in the final regression model. Among them, T7 has the greatest contribution in the application of design psychology, with a regression coefficient of 0.839. The background characteristics of the respondents have the smallest contribution, with a regression coefficient of 0.000. This indicates that the respondents' profession has a relatively small impact on the application of design psychology in digital media technology design and can be ignored. Among the seven application methods of design psychology, T3 has the smallest contribution of 0.026. Therefore, to improve the level of digital media design, it is necessary to grasp the application of the three elements of color, composition, and pattern in design psychology, optimize design methods, and enhance design level.

4 Conclusion

This article draws the following conclusion through a survey of questionnaire data: According to the analysis of multiple linear regression equations, the seven application methods of design psychology in digital technology media contribute the most, in order: considering color, composition, pattern, considering color and composition, considering color and pattern, considering composition and pattern, only considering color, only considering composition, only considering pattern, and the subject's major, There is a significant positive impact of design psychology on the improvement of digital media technology design (P<0.05). Color, composition, and pattern, as important elements in design psychology, play an important role in digital media design[5]. By using these three elements, we can scientifically grasp the balance of works in digital media design, better face the new needs of digital media technology creation, and create digital media technology works that are more in line with the psychological needs of the audience[6].

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