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Emotional Design and Consumer Purchase Intention of Digital Cultural Creative Products under the Background of Artificial Intelligence

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Abstract
Digital cultural and creative products have transformed the landscape of cultural dissemination; however, their emotional resonance remains insufficiently examined. Although such products fulfil functional demands, contemporary consumers increasingly seek designs that align with their emotional and spiritual expectations. This study investigates the incorporation of emotional design into digital cultural products, augmented by artificial intelligence (AI), to evaluate its influence on consumer purchase intention. It addresses a notable gap concerning the application of emotional design principles within the realm of digital cultural products. Adopting a mixed-method research design that integrates both qualitative and quantitative approaches, the study utilises parametric design, intelligent hardware, and 3D printing technologies to embed emotional design elements into these products. Through an experimental framework, 20 participants assessed emotionally designed products against traditional ones, evaluating them based on five dimensions: appearance, functionality, cultural significance, creativity, and purchase intention. The results reveal an 8.23% increase in purchase intention for emotionally designed products compared to traditional alternatives. Furthermore, participants assigned higher ratings to emotionally designed products in appearance, creativity, and cultural value, with scores generally exceeding those of traditional products by 1 to 2 points. These findings underscore the capacity of emotional design to strengthen consumer engagement and enhance purchase intention. The study highlights the critical role of emotional design in shaping digital cultural products and suggests that its thoughtful integration may foster greater consumer satisfaction, loyalty, and sales.

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Introduction

In the contemporary era, which prioritises experience and emotion, product design has progressively evolved from a functionalist approach, concerned solely with practicality, towards a human-centred perspective that emphasises user experience. Within the design domain, numerous products have begun to incorporate emotional design concepts. Currently, scholarly research on emotional design predominantly addresses two key dimensions: the types of products and the diverse emotional needs of different user groups (Demirbilek & Sener, 2003). Product types encompass both tangible products and digital products, while user groups exhibit varying emotional expectations. Therefore, the content and methods of product design must be tailored to address these distinct requirements. Although the research framework for emotional design has become relatively well-developed, its application within the sphere of digital cultural and creative products remains limited (Zhou et al., 2021).

Research Objectives

1. To analyse the impact of integrating artificial intelligence technology into digital cultural and creative products on emotional design and its influence on increasing consumers' willingness to buy.
2. To explore the role of emotional design, enhanced by artificial intelligence, in shaping consumer perceptions and emotional engagement with digital cultural and creative products.

Literature Review

Impact of Emotional Design on Consumer Engagement and Learning Outcomes

A growing body of research has examined the role of emotional design in various contexts, emphasising its positive effects on user engagement. For instance, a study on multimedia teaching materials demonstrates that the incorporation of emotional design elements within lessons fosters positive emotions, enhances mental engagement, and improves the academic performance of first-year students (Uzun & Yıldırım, 2018). Similarly, an investigation into affective design in multimedia learning reveals that emotionally designed texts can significantly improve learning outcomes (Stark et al., 2018). Both studies confirm that emotional design supports user engagement; however, while the former specifically links emotional design to academic performance, the latter discusses its broader influence on instructional design. This comparison highlights that emotional appeal in educational materials can serve different purposes depending on their application. Furthermore, research on emotional design in data visualisation illustrates how emotional elements can deepen

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user engagement by adding nuance to the way data are interpreted (Andry, 2020). These findings suggest that the application of emotional design extends beyond educational contexts, influencing other domains such as data visualisation, where it enhances user comprehension and connection.

Emotional Design in Digital Consumer Behaviour and Interactive Interfaces

The role of emotional design in shaping consumer behaviour, particularly within e-commerce, has also been examined. One study found that emotional design significantly influences consumer purchasing behaviour in online environments and offers valuable insights for the development of effective digital platforms (Okur et al., 2020). Another study extended this notion by demonstrating that emotional design can reduce mental effort and enhance performance, particularly in multimedia learning contexts, suggesting its potential relevance for improving online consumer experiences (Le et al., 2018). Both studies emphasise the importance of emotional design in fostering user engagement; however, while the former focuses on actual consumer behaviour in digital marketplaces, the latter explores cognitive responses within learning environments. Further expanding this discourse, research on emotional design in self-media interfaces highlights how emotional design shapes user interaction within the specific context of China's digital ecosystem (Tong, 2023). Additionally, another study identifies that emotional product design is embraced across four distinct levels and indicates a growing trend among industries in recognising the significance of emotional design (Tong, 2023). Collectively, these studies underscore the expanding application of emotional design; nonetheless, its exploration within the domain of digital cultural and creative products remains limited. The disparity between conceptual discussions and practical implementations in this field suggests a need for further research on the potential role of emotional design in the development of such products.

Advancements in Artificial Intelligence Across Various Fields

With the rapid advancement of artificial intelligence (AI), its application has expanded across numerous domains, creating intersections with fields such as neuroscience and telecommunications. One study explored the connections between AI and neuroscience, drawing on insights from neural computation in animals to understand how AI models replicate biological processes (Xu & Wu, 2022). In contrast, another study demonstrated that AI plays a critical role in the development of smart networks within 5G technologies, particularly in resource optimisation and addressing challenges in large-scale communication systems (Hassabis et al., 2017). Distinct from these scientific and technical applications, further research has highlighted AI's profound influence on various social and economic spheres, arguing that AI has the potential to revolutionise industries through digital transformation and by enabling businesses to navigate entrepreneurial risks and achieve competitive advantage (Li et al., 2017). Taken together, these studies illustrate the extensive scope of AI's

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applications, underscoring that its influence on traditional industries is profound and signals the emergence of a new era of innovation driven by AI technologies.

Artificial Intelligence in Practical Applications and Product Design

AI's practical applications extend beyond theoretical advancements into essential fields such as healthcare and cybersecurity. One study focused on AI's role in fault diagnosis, offering insights into how AI algorithms are applied within industrial settings and addressing the challenges associated with their implementation (Makridakis, 2017). Another study examined the use of AI algorithms in the context of non-tariff barriers (NTBs), exploring their economic implications and proposing solutions to challenges related to dataset utilisation and algorithm performance (Liu et al., 2018). In the healthcare sector, research on AI's contribution to radiology has demonstrated AI's capacity to assist in prioritising medical cases and detecting anomalies that are often difficult to identify through conventional methods, thereby enhancing diagnostic accuracy and improving clinical outcomes (Glauner et al., 2017). Regarding cybersecurity, further research showed that AI-based detection methods are effective in uncovering concealed data exchanges between colluding applications, offering practical solutions for safeguarding digital networks (Hosny et al., 2018). The integration of AI with product design holds significant potential for fostering innovative solutions, particularly through the incorporation of emotional design into digital cultural products to enhance user experience and engagement. Collectively, these examples underscore AI's ability to address complex issues, supporting its broader application within creative industries and product design.

Literature Gap

Although substantial research has been carried out on emotional design across diverse fields, including education (Stark et al., 2018; Uzun & Yıldırım, 2018) and consumer behaviour (Okur et al., 2020), a significant gap remains in the integration of AI with emotional design, particularly within the domain of digital cultural products. Existing studies, such as those on data visualisation (Andry, 2020) and multimedia learning (Le et al., 2018), examine the role of emotional design but overlook the potential contribution of AI in strengthening emotional engagement. Consequently, this study aims to address this gap by investigating how AI-enhanced emotional design affects consumer purchase intention and engagement with digital cultural and creative products.

Digital Cultural and Creative Products Emotional Design Technology Algorithm

Analysis of Emotional Design

1) Emotional Analysis

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Maslow classified human needs into five hierarchical levels. The first level comprises physiological needs, followed by the need for safety, the third level reflects the human desire for belonging, the fourth involves the need to be valued, and the fifth represents the realisation of personal values (Fadi et al., 2022). Maslow's theory of needs illustrates that individuals express their needs progressively from lower to higher levels. Once the functional aspects of products fulfil basic human requirements, individuals tend to seek emotional and spiritual satisfaction. The structure of Maslow's hierarchy of needs is illustrated in Figure 1.

Figure 1: Maslow's Theory of Needs
Source: Shikalepo, Elock (2020).

Emotions are an essential aspect of daily human life, guiding individuals in evaluating their circumstances and influencing the decisions they make. By examining the nature of emotions, designers can integrate emotional elements into product design, enabling tangible products to convey emotional experiences and responses during their use.

2) Emotional Design

Contemporary design often places excessive emphasis on the practical functions of products, overlooking the emotional connection between the product and the user. In response, emotional design has been proposed to shift the design paradigm from purely functional to emotionally engaging. A three-level theory of emotionalisation was introduced, which explains human cognitive activities through three dimensions: visceral, behavioural, and reflective (Liu et al., 2024). Corresponding to these dimensions, emotional design also operates on three levels, each addressing different aspects of user experience. The three-level theoretical framework of emotionalisation is illustrated in Figure 2.

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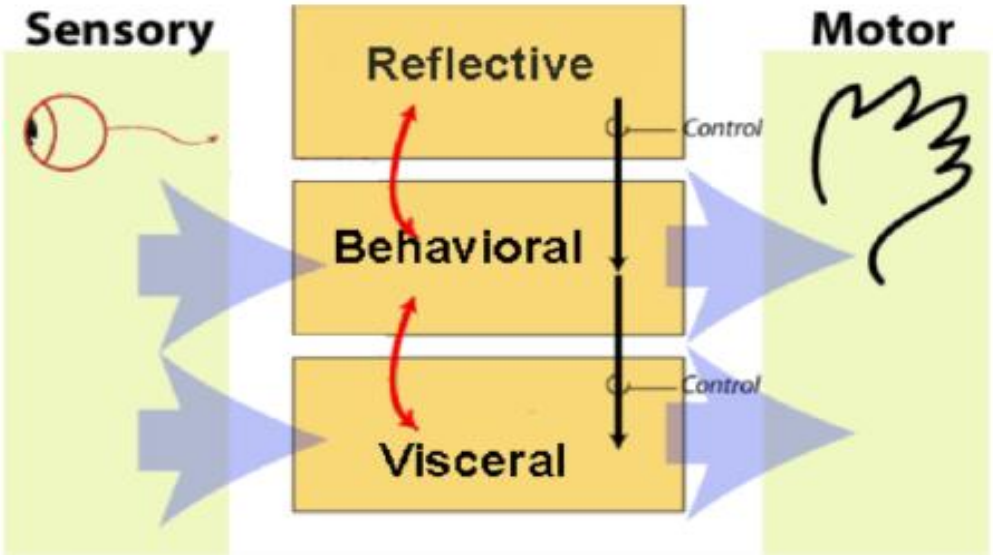

Figure 2: Emotional Three-Level Theoretical Structure
Source: Norman (2002).

Visceral-level design refers to the initial sensory response in which individuals receive information from the external environment through neural signals transmitted by sensory organs such as the eyes, ears, nose, tongue, and skin. This process enables the brain to generate immediate feedback to external stimuli, forming basic feelings. At this design level, it is essential to analyse five sensory dimensions—vision, hearing, smell, taste, and touch—to understand the emotional responses they evoke. Behavioural-level design focuses on the user's experience when interacting with the product, encompassing its primary functions, quality, and practicality. The functional aspect of cultural and creative products is a critical determinant of their market competitiveness; insufficient functionality diminishes a product's appeal and value. Quality reflects a product's durability and consistency in meeting consumer needs. Therefore, in designing cultural and creative products, it is vital for designers to consider consumer demands and to examine the behavioural and psychological dimensions that influence user interaction and satisfaction. Reflective-level design pertains to the deeper, symbolic meaning of a product, shaped by consumer culture, personal experiences, education, and individual differences. This level is concerned with the long-term emotional connection established between the user and the product. It plays a vital role in influencing brand perception and user satisfaction, as the product's use fosters emotional bonds that contribute to brand identity and loyalty, encouraging consumers to favour the brand in future purchasing decisions.

Analysis of Emotional User Demands of Digital Cultural and Creative Products

The emotional design of digital cultural and creative products involves acknowledging and addressing the emotional needs of consumers during the design process, with a heightened focus on users' inner experiences. Effective product design requires a comprehensive analysis of consumers' genuine feelings and underlying

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needs. By carefully considering elements such as the product's form, material texture, and mode of interaction, designers can create products that foster a closer connection between users and products, ultimately delivering a comfortable and engaging emotional experience.

1) Functional Elements

The core aspect of any product lies in its functionality, which serves as the fundamental criterion for assessing product quality. Meeting the functional requirements of cultural and creative products involves two key steps: first, analysing the specific functions of various components, and second, identifying the essential functions the product must fulfil while eliminating unnecessary elements. Incorporating engaging and innovative functional designs can enhance users' enjoyment during interaction and significantly boost their intention to purchase.

2) Morphological Elements

Product form design represents the most immediate visual experience perceived by consumers. It adheres to the principles of design aesthetics, using fundamental aesthetic concepts as core design elements. Through carefully crafted form design, the product's visual appeal is enhanced, thereby fulfilling consumers' aesthetic expectations and their desire for visually pleasing product appearances.

3) Materials and Process Elements

Materials commonly used in industrial design are generally classified into two main categories. The first category comprises natural materials, which are directly sourced from the natural environment, including leather, wood, and stone. The second category consists of synthetic materials, produced by processing natural raw materials to alter their chemical properties; examples include plastics, rubber, and various alloys. In the design process, it is essential to select materials that align with the intended function and practical requirements of the product to ensure both performance and aesthetic quality.

Artificial Intelligence Technology

1) Parametric Design Technology

2) Traditional design methods depend on designers manually converting conceptual ideas into tangible products, whereas parametric design employs data processing, analysis, and logical computation to generate multiple design alternatives. In parametric design, product attributes such as function and form are defined as parameters, and by manipulating these parameters through specialised software, a variety of product outcomes can be produced according to predefined rules (Eltaweel & Yuehong, 2017). This method aligns with the

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current research objective, as it highlights the role of artificial intelligence and parametric design in the creation of emotionally engaging products. By incorporating AI into the design process, both user experience and consumer purchase intention for digital cultural products can be optimised. Consequently, AI-supported parametric design serves as a key mechanism for achieving emotional design in digital cultural and creative products. The structure of parametric design is illustrated in Figure 3.

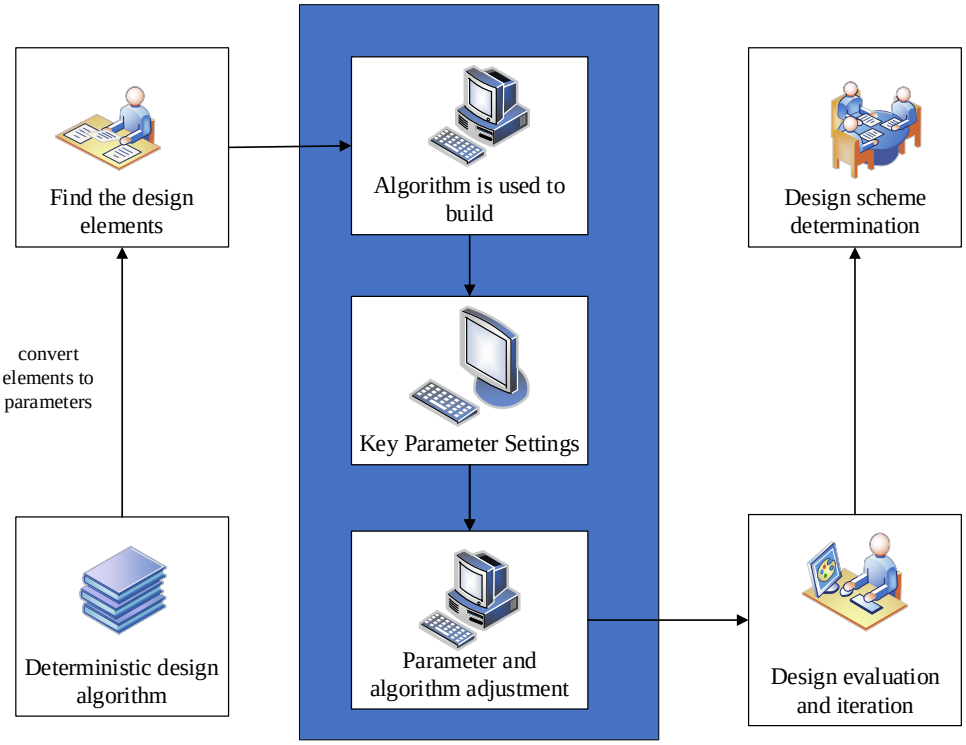

Figure 3: Parametric Design Structure
Source: Monedero (2000).

As illustrated in Figure 3, the parametric design process begins with the designer identifying the design objective and extracting relevant design elements, which are then translated into parameters. Subsequently, an algorithm is developed, and key parameters are established to guide the design process. These parameters and the algorithm are adjusted iteratively based on design requirements. The process concludes with design evaluation and refinement, leading to the finalisation of the design solution.

The parametric design algorithm is outlined as follows (Liu et al., 2024):

X_m is set as the mth attribute of the element X, I_jm indicating the m-th attribute of the j-th element in the feature library I, and W_m indicating the weight of the m-th attribute.

$$d_{jk1} = \sum_{m=1}^{n} W_m \, d(I_{jm}, X_m) \quad (1)$$

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$$\sum_{m=1}^{n} W_m=1 \quad (2)$$

$$f(I_{jm}, X_m) = 1 - \frac{I_{jm}-X_m}{2} \quad (3)$$

Formula 3 represents the degree of correspondence between the m-th element of the element library X and the m-th attribute of the j-th element within the element library I. This degree of matching reflects how well a specific element aligns with a given attribute, serving as a basis for evaluating the suitability of elements during the parametric design process.

According to the above analysis, the fitness function is defined as follows:

$$F_I = C_{max} - E_i \quad (4)$$

$$E_i = \frac{1}{2}\sum_K \sum_P (y_i' - y_i)^2 \quad (5)$$

These parametric design functions allow for precise regulation of product attributes by establishing key parameters and their interrelations through computational algorithms. Through the application of these functions, designers can create diverse variations of digital cultural products that resonate with consumers' aesthetic and emotional expectations. Within the scope of this research, the integration of artificial intelligence with parametric design enhances the flexibility and responsiveness of emotional design, ensuring that products elicit the intended consumer reactions. This method directly contributes to the study's objective of improving consumer purchase intention through AI-driven emotional design.

3) Smart Hardware Technology

Intelligent hardware technology is essential for improving product functionality by enabling autonomous operation, interactive experiences, and aesthetic value (Lin et al., 2024). Within the framework of this research, the integration of intelligent hardware into digital cultural and creative products facilitates a more immersive and emotionally resonant user experience. Through the incorporation of AI-driven smart features—such as adaptive interaction and personalised responses—emotional design is enhanced, fostering greater consumer engagement. This approach aligns with the study's objective of leveraging AI-enhanced emotional design to influence consumer purchase intention and increase product attractiveness. The smart hardware industry ecosystem is illustrated in Figure 4.

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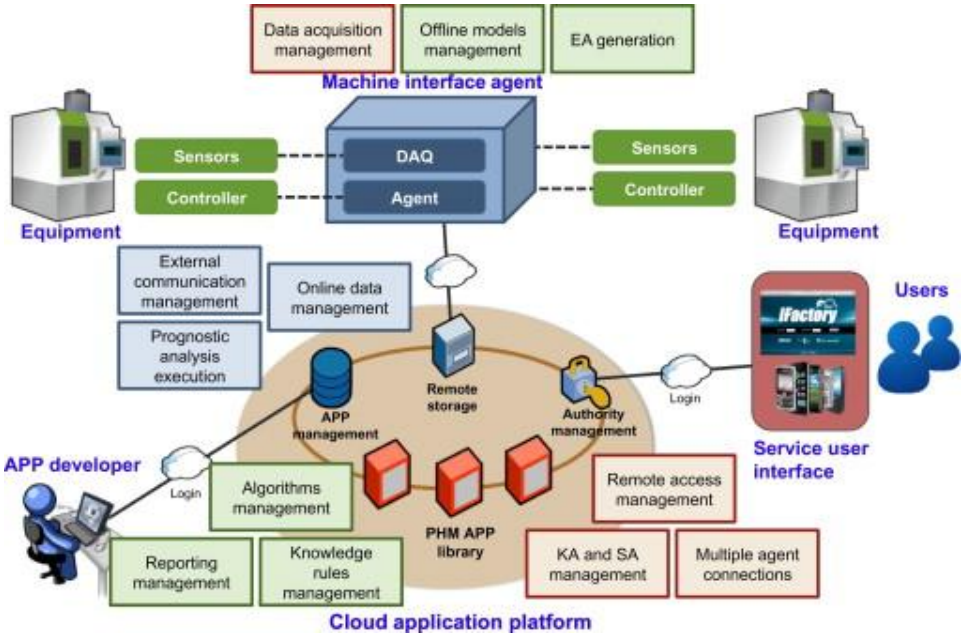

Figure 4: Ecological Map of Intelligent Hardware Industry
Source: Lee et al., (2015).

As shown in Figure 4, AI-based enterprises and component manufacturers supply technologies and devices to smart Original Equipment Manufacturer (OEM) enterprises. Smart OEM enterprises operate on the application side by collecting and processing data, while the application side provides feedback to OEMs to improve products and services. Additionally, AI-based enterprises can directly engage with the application side through general intelligent services. The individual is assessed using a fitness function, where the fitness value reflects the quality of the individual. A lower fitness value signifies poorer quality. The specific design of the fitness function is determined by the problem's solution requirements. Each attribute is assigned a weight ranging from 0 to 1, and the sum of all weights equals 1. Moreover, each attribute is given a corresponding score between 0 and 1. The evaluation score function for each element is expressed as:

$$\text{Score}(x_i) = W_f \cdot C_{f_i} + W_c \cdot C_{c_i} + W_r \cdot C_{r_i} + W_p \cdot C_{p_i} \quad (6)$$

W_f and C_{f_i} are the weight and score, respectively, of the functional attribute, W_c and C_{c_i} are the weight and score of the complexity attribute, respectively. W_p and C_{p_i} are the weight and score of the performance attribute, respectively. W_r and C_{r_i} are the weight and score of the reliability attribute, respectively.

$$W_f + W_c + W_r + W_p = 1 \quad (7)$$

The functional score of an attribute can be described by the following expression:

$$C_{f_i} = \frac{\sum_{j=1}^{total} w_j}{total} \quad (8)$$

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$$w_j = \begin{cases} 1 & if\ i = j \\ 0.8 & if\ i \neq j \end{cases} \quad (9)$$

Among them, total is the total number of parameter types and return value types in the tone that provides the service r_j, and w_j represents the degree of matching between the jth type in the tone.

The complexity score of an attribute can be described by the following expression:

$$C_{c_i} = \frac{1}{f_r+1} \quad (10)$$

The reliability of an attribute can be described by the following expression:

$$c_{r_i} = \begin{cases} 0 & p < p_r \\ 1 & p \geq p_r \end{cases} \quad (11)$$

Among them $p_r$is a reliability standard developed, when the reliability of the service provided by the attribute is lower than the standard, the score is 0, otherwise, the score is 1.

The response time of the attribute, as a measure defined from the user's point of view, can be described by the following expression:

$$C_{P_1} = \begin{cases} 0 & P \leq P_{min} \\ \frac{p-p_{min}}{p_{max}-p_{minn}} & p \in (p_{min}, p_{max}] \\ 1 & p \in (p_{max}, \infty] \end{cases} \quad (12)$$

4) 3D Printing Technology

3D printing employs advanced 3D technology for rapid prototyping, integrating modern innovations such as computers, numerical control, and materials science to directly generate patterns from digital models. This approach eliminates the need for traditional casting methods, thereby shortening the production cycle and reducing manufacturing costs. Typically, the process of creating an object through 3D printing involves four essential stages: modelling, layering, printing, and post-processing.

The 3D printing technology algorithm is expressed as follows (Zhou et al., 2020):

Hidden Layer Activation Function f:

$$f_{(x)} = \frac{1}{1+e^{-x}} \quad (13)$$

The Hidden Layer Output H:

$$H_f = f(\sum_{i=1}^{n} \omega_{ij} x_i - a_j) \quad (14)$$

Predicted Output O:

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$$O_K = \sum_{j=1}^{l} H_j \, \omega_{jk} - b_k \quad (15)$$

Where k=1,2,...m

The prediction error e is calculated, Y is the expected output:

$$e_k = Y_k - O_k \quad (16)$$

Where k=1,2,...m

Weight ω_ij 、 ω_jk are updated:

$$\omega_{ij} = \omega_{ij} + \eta H_j (1 - H_j) x(i) \sum_{K=1}^{m} \omega_{jk} e_k \quad (17)$$

Where i=1,2,...n, j=1,2,...l

$$\omega_{jk} = \omega_{jk} + \eta H_j e_k \quad (18)$$

Where j=1,2,...l, k=1,2,...m

Threshold a, b are updated:

$$a_j = a_j + \eta H_j (1 - H_j) \sum_{K=1}^{m} \omega_{jk} e_k \quad (19)$$

Where j=1,2,...l

$$b_k = b_k + e_k \quad (20)$$

Where k=1,2,...m

In the given expression, n represents the number of nodes in the input layer, m denotes the number of nodes in the output layer, and L signifies the number of nodes in the hidden layer. 3D printing technology facilitates the rapid prototyping of digital cultural and creative products, thereby reducing production costs and enhancing design flexibility (Žarko et al., 2017). The algorithm employs hidden layer activation functions and weight adjustments to optimise the printing process, ensuring precise material layering and structural accuracy. Within this research, 3D printing plays a pivotal role in transforming AI-enhanced emotional design concepts into tangible products, enabling customised, interactive, and aesthetically appealing designs that strengthen consumer engagement and increase purchase intention.

Furthermore, the parametric design method provides new creative directions for product modelling, encouraging designers to integrate diverse design factors. Intelligent hardware technology offers reliable technical support and interactive experiences, while 3D printing technology, as a matured system, enables rapid product prototyping. However, the selection of appropriate machines and materials must align with design specifications and cost considerations. Throughout product

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development, these three digital technologies—parametric design, intelligent hardware, and 3D printing—support and complement each other. Their integration enables the creation of products that better meet consumer needs (Yang, 2017). The emotional design process of digital cultural and creative products is illustrated in Figure 5.

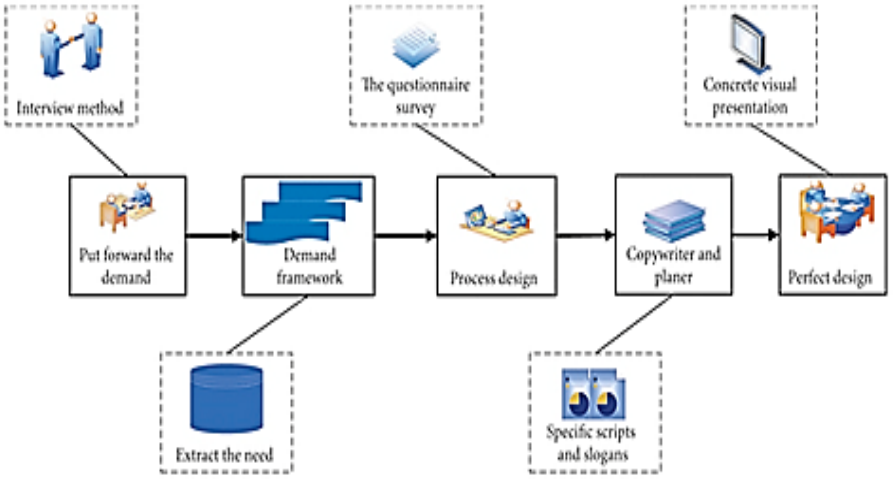

Figure 5: Emotional Design Process of Digital Cultural and Creative Products
Source: Zhang & Hong (2022).

As shown in Figure 5, the emotional design process of digital cultural and creative products begins with the establishment and analysis of a resource database, developed through comprehensive document review and data collation. Following this, design positioning is examined to align the product with consumer needs and cultural relevance. Subsequently, parametric design technology and intelligent hardware technology are employed to define the product's form and functionality. Finally, 3D printing technology is utilised to produce a prototype for evaluation, enabling iterative refinement based on user feedback and performance assessment.

Emotional Design Technology Experiment of Digital Cultural and Creative Products

Experimental Method

The digital cultural and creative products with emotional design were compared to ordinary counterparts to assess their impact on consumer perception. Two categories were selected: architectural model sticky notes and the Palace Museum's Chaozhu Headphones, alongside traditional versions. These were chosen for their emotional design elements, cultural value, and consumer popularity. Using purposive sampling, 20 consumers with prior purchasing experience were selected. Participants rated the products on appearance, function, culture, creativity, and purchase intention using a 10-point scale. The data were analysed to examine the influence of emotional design

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on consumer purchase behaviour.

Data Analysis

1) Comparison of the Appearance of the Two Groups of Products

Figure 6 presents the results of consumers' evaluation of product appearance. Moreover, as shown in Figure 6, the appearance scores of emotionally designed products are generally 1–2 points higher than ordinary products. For the architectural model sticky notes, over 85% of evaluations scored 8 or above, while the Palace Museum's "Chaozhu Headphones" received over 90% of scores above 8. In contrast, ordinary products scored between 6 and 8, with no scores exceeding 9. These results indicate that emotional design makes product appearance more aligned with consumer aesthetics, demonstrating that emotional design can effectively resonate with consumers.

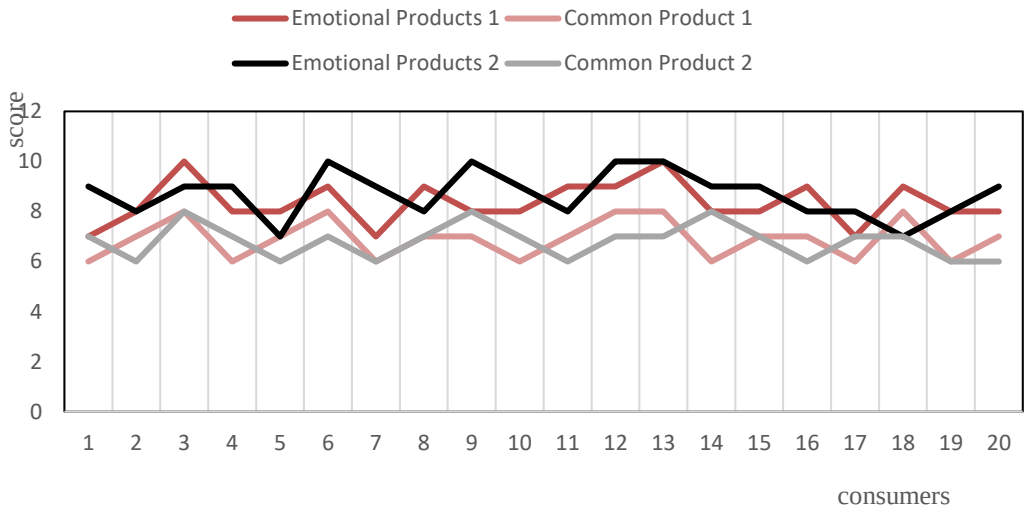

Figure 6: Product Appearance Comparison Data Sheet
Source: Author

2) Functional Comparison of the Two Groups of Products

The results of consumers' functional ratings are shown in Figure 7. As illustrated, 80% of consumers gave higher functional scores to emotional products compared to ordinary ones. Although the practical functions are similar, emotional products focus more on interesting features and participatory experiences, offering users positive emotional engagement. For instance, the architectural model sticky notes enable users to gradually reveal a paper sculpture as each note is removed, enhancing participation and enjoyment, thereby triggering an emotional response.

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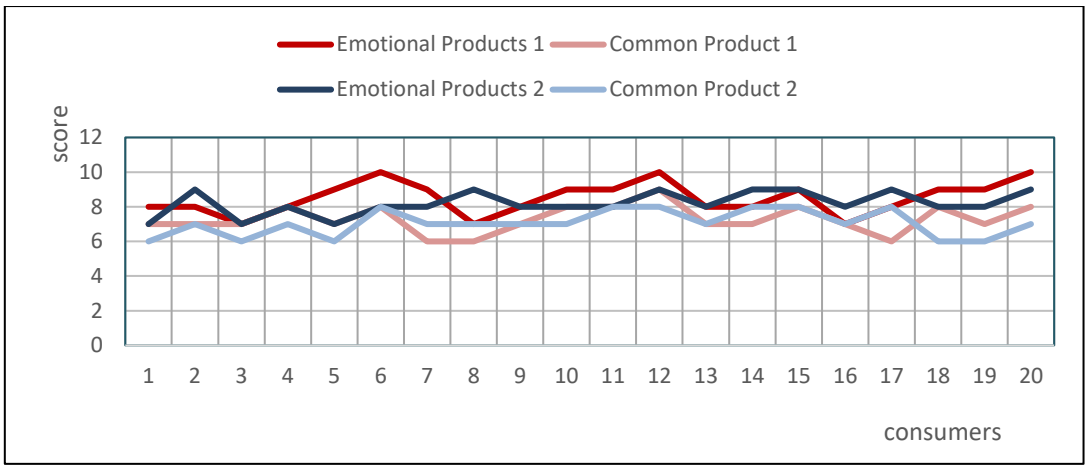

Figure 7: Product Functional Comparison Data Sheet
Source: Author

The Cultural Comparison of the Two Groups of Products

Figure 8 shows the results of consumers' cultural evaluation of products. As shown, the cultural scores of emotional products are consistently 1–2 points higher than those of ordinary products, indicating that emotional products better integrate cultural connotations, enhancing consumer resonance. The Palace Museum's "Chaozhu Headphones" not only retain practical functions but also blend the symbolic status of the Chaozhu with modern electronics, allowing consumers to enjoy cultural significance during use and increasing product attachment.

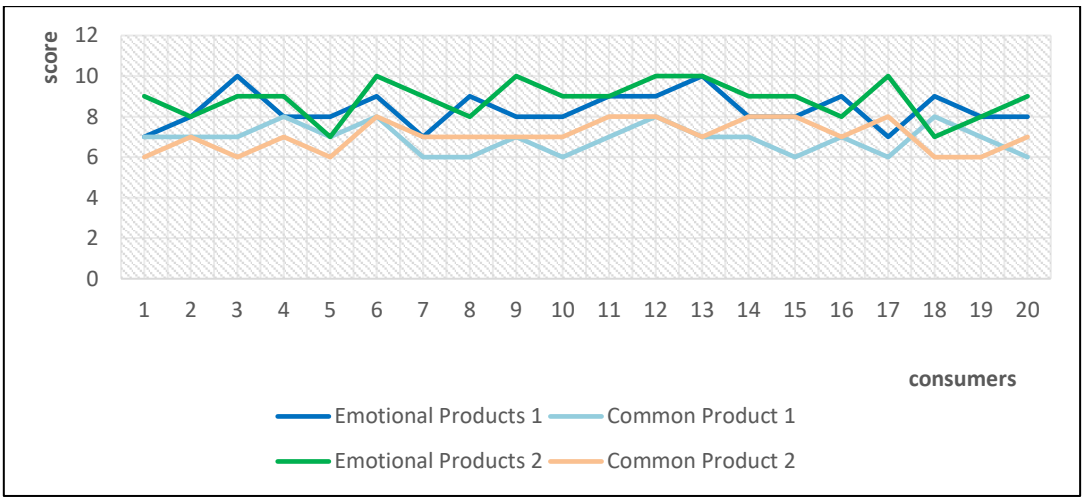

Figure 8: Cultural Comparison Data Sheet of Products
Source: Author

Creative Comparison of Two Groups of Products

Figure 9 shows the results of consumers' creativity score for the product. As shown, consumers generally rated emotional cultural and creative products higher in creativity and expressed positive attitudes towards innovative design. The creativity scores of ordinary products were lower, as consumers felt that although they were

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functional, they lacked innovation and had weaker overall features. The Palace Museum's "Chaozhu Headphones", combining history and technology, and the architectural model sticky notes, which enhance user participation, gained strong consumer recognition. This indicates that creativity in digital cultural and creative products significantly influences consumer experience.

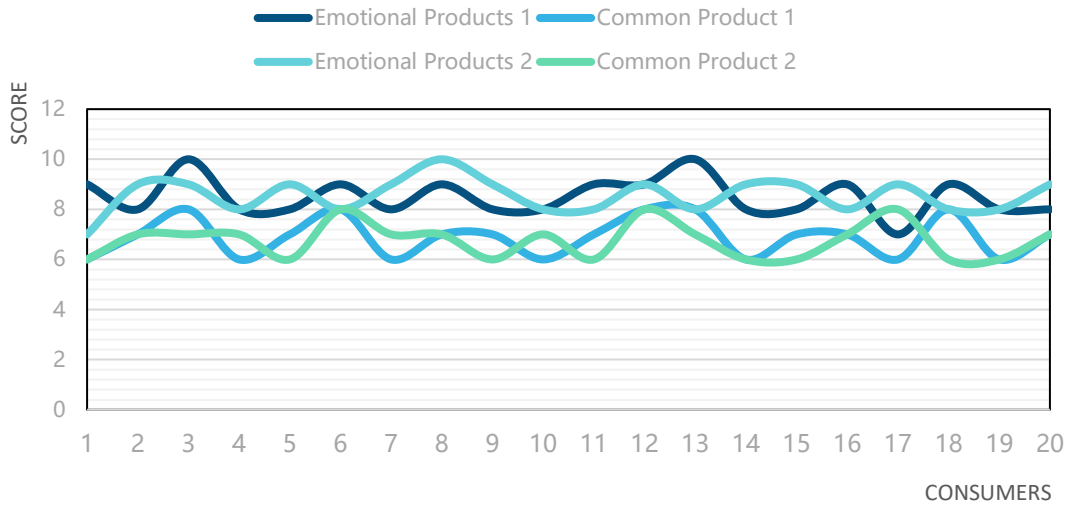

Figure 9: Product Creativity Comparison Data Sheet
Source: Author

Consumer Purchase Intention Survey

Figure 10 shows the survey results of consumers' purchase intentions for the products. As shown, the willingness to buy emotional products was significantly higher, with 95% and 92% of consumers expressing interest, compared to 83% and 85% for the ordinary products. This indicates an increase in consumer purchase intention by 8.23%. It can be concluded that incorporating emotional design into products effectively enhances consumer desire to purchase and increases product user engagement.

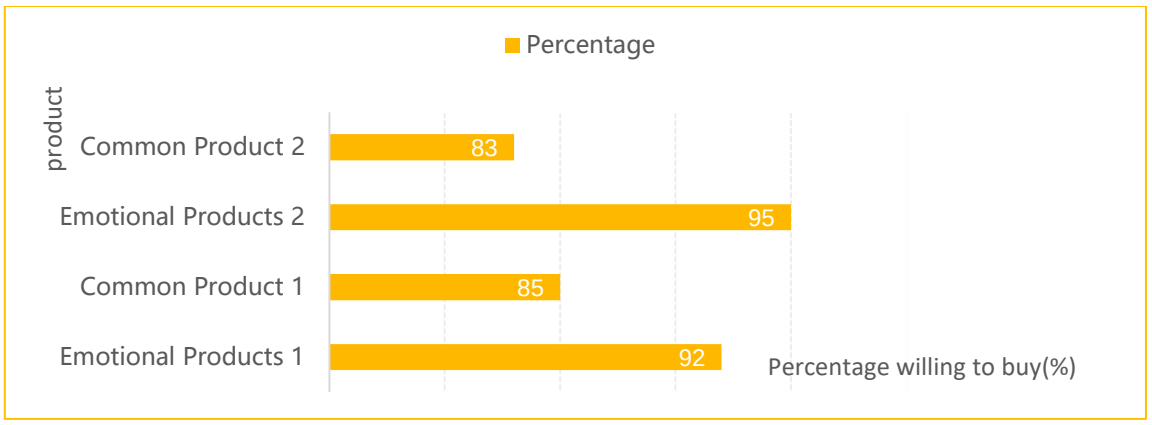

Figure 10: Product Purchase Intention Chart
Source: Author

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Discussion

The findings of this study demonstrate that integrating emotional design into digital cultural and creative products significantly enhances consumer purchase intention. The experimental results showed an 8.23% increase in purchase intention for emotionally designed products compared to traditional ones. This aligns with previous research indicating that emotional engagement in product design positively influences consumer decision-making (Desmet & Hekkert, 2007). Emotional design fosters a sense of connection between the user and the product, making it more appealing and memorable, which in turn increases the likelihood of purchase (Kim & Sullivan, 2019). A key aspect of emotional design is its influence on aesthetics and creativity. This study found that participants rated emotionally designed products higher in appearance and creativity, with an increase of 1-2 points on average compared to non-emotional products. This supports the theory that aesthetically pleasing designs enhance user satisfaction and emotional attachment (Bhandari et al., 2019). Similarly, other research has shown that visually appealing and creative product designs contribute to a more engaging user experience, which fosters a deeper emotional connection and drives purchasing behaviour (Hassenzahl et al., 2010). The findings of this study reinforce these perspectives, demonstrating that consumers prefer digital cultural and creative products that incorporate elements of emotional design.

Additionally, the study highlights the role of cultural integration in consumer engagement. The Palace Museum's Chaozhu Headphones, which blend traditional cultural symbols with modern technology, received higher ratings in cultural significance and purchase intention. This is consistent with findings suggesting that products incorporating cultural heritage elements evoke a sense of nostalgia and belonging, making them more attractive to consumers (Benaissa & Kobayashi, 2023). Moreover, research has shown that cultural storytelling in product design enhances consumer attachment and willingness to buy (Lina et al., 2022). This suggests that integrating emotional and cultural elements in digital creative products can create a more meaningful consumer experience.

Functionality and interactivity also played a critical role in consumer perception. The study found that emotional products were rated higher in functionality due to their participatory and interactive features, such as the architectural model sticky notes that gradually form a sculpture. This finding is supported by research emphasising that interactive and engaging product experiences contribute to a stronger emotional connection (Paramita et al., 2021). Furthermore, it has been highlighted that usability and aesthetics must complement each other to enhance the overall user experience, reinforcing the idea that emotional design should not only focus on appearance but also interactive usability (Sutcliffe, 2016).

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Moreover, the findings of this study align with Maslow's hierarchy of needs, demonstrating that emotional design addresses higher-level consumer desires beyond basic functionality. While traditional digital cultural products fulfil functional and safety needs, emotionally designed products tap into the higher levels of belonging, esteem, and self-actualisation by fostering cultural connection, creativity, and personal expression. Additionally, Norman's three-level emotional design theory supports the results, as emotionally designed products received higher ratings in appearance (visceral level), functionality (behavioural level), and cultural engagement (reflective level). This confirms that integrating emotional design enhances consumer attachment, satisfaction, and ultimately, purchase intention. Overall, the study confirms that emotional design, cultural integration, and interactivity are key factors in enhancing consumer engagement and purchase intention. These findings suggest that digital cultural and creative products should incorporate emotional elements to increase their market appeal.

Conclusion

The rapid development of the digital cultural and creative industry has resulted in many products that only fulfil practical needs, lacking deeper cultural significance. Emotional design, however, can address consumers' emotional needs, providing a more enjoyable experience during product use. This study integrated emotional design into digital cultural and creative products using artificial intelligence technology, leading to an 8.23% increase in consumer purchase intention. This demonstrates that emotional design better aligns with consumers' emotional attitudes and effectively meets their inner needs.

Study Limitations

Despite its valuable insights, this study has several limitations. First, the sample size was restricted to 20 participants, which may not fully reflect the broader consumer population. Second, the study focused on only two product categories, limiting the generalisability of the findings to other digital cultural and creative products. Third, the research relied on self-reported data, which could introduce biases. Future studies should increase the sample size, explore a wider range of product categories, and incorporate behavioural data for more comprehensive results.

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