Understanding university graduate’s independent entrepreneurship by 3D designing cultural and creative products

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Abstract. In the context of the COVID-19 pandemic, the global economy is sluggish and the employment situation is grim. It is difficult for fresh graduates to find a job with a stable income. Therefore, college students' self-employment has become one of the main forms of college graduates. Among them, designing a meaningful cultural and creative product for sale is one of the ways for art graduates to achieve employment. However, college students' entrepreneurship must face fierce competition from existing cultural and creative products in the market, which often leads to a high failure rate of college students' entrepreneurship and a weaker ability to resist market risks. Based on the above problems, this paper is triggered to help college students quickly adapt to the business competition environment. The research methods of this subject mainly include the following two: (1) With the help of teachers, college graduates majoring in art and design can design cultural and creative products with practical, beautiful, and cultural characteristics, so that these novel cultural and creative products have price competitiveness and product design competitiveness in existing cultural and creative products. (2) Helping college students to visit enterprises broadening employment channels, and expanding sales forms through college leaders are also effective ways to improve students' self-employment. From these two aspects, the main research content of this paper is to promote the entrepreneurship and employment of college students in the context of COVID-19.

Keywords: Art and design; Creative products; Entrepreneurship education.

1. Introduction

In the context of the epidemic, the reasons for the interruption of education are not limited to the epidemic, but are also affected by wars, local conflicts, and other types of impacts. These factors also have a great influence on the further study or employment of college students after graduation. For graduates majoring in art and design, it is also the original intention of this article to design a set of cultural and creative products with cultural connotations that can be sold, to help students start their businesses, and to provide broader and more timely solutions for graduate employment. (Bozkurt, 2020). In recent years, the sales of cultural and creative products have become a marketing growth point for brand value. Cultural and creative products are processed and designed in the process of well-known cultural brand concepts, such as Disney, Forbidden City cultural and creative products, Dunhuang cultural and creative products, etc.

The economic impact of cultural heritage values penetrates every aspect of life (Doyon, 2019) For example, in terms of the protection and utilization of intangible cultural heritage, Catalonia and other regions have made effective use of the local intangible cultural heritage in the fishery economy and promoted the prosperity of the local fishery economy. The decline of the fishery economy and the revitalization after the introduction of the concept of intangible cultural heritage have witnessed different social changes and changes in economic conditions. Such cases inspire us to make good use of the concept of intangible cultural heritage and to be good at converting the concept of intangible cultural heritage protection into economic value. As you can see, creativity is a fascinating talent. How to use it efficiently: Cognitive psychology researchers try to analyse the relationship among
humans, machines, and psychology, to make the design more humanized, better serve people, and reflect the human-oriented nature of the design. Creating more popular products is the only way for designers to learn and create. (Abidin, Christoforidou, & Liem, 2009). This leads us to the original research direction and the research question: what kind of cultural and creative products can win the favour of consumers? In other words, which cultural and creative products can better bring economic benefits to the brand through effective marketing methods? Therefore, this paper attempts to research the design types and sales patterns of cultural and creative products in the Chinese consumer market and find market vacancies to meet more brand demands and consumer demands.

After setting the discussion background of the topic, a new path for college students' entrepreneurial business is designed for art and design graduates to refer to the form of independent entrepreneurship. The objectives of this study are as follows: (1) design a set of cultural and creative products in combination with the local cultural background. (2) Broaden the new employment path for art and design students under the background of the epidemic.

2. Literature Review

The literature review part of this paper will summarize and summarize four parts, including the changes in university education mode under the background of the epidemic, the employment and entrepreneurship forms of college students, cultural and creative products of intangible cultural heritage elements, and elements of humanized product design.

2.1. The reform of university education under the background of epidemic

Since the covid-19 pandemic started in 2019, it has been affecting the way everyone around the world lives and learns, including schools, universities, and educational institutions. Globally, when the massive Covid-19 outbreak hit, and all schools and universities were required to close to avoid the spread of the virus, the mechanism for continuing teaching has shifted to online learning (online distance education). Some of them related it with the physical system environment which relevant to the industry 4.0 (Abidin et al., 2021). Virtual awareness programs should be conducted to provide the public with the most up-to-date information on infection control procedures and how to maintain a hygienic environment, as well as encourage people to adopt social distance and avoid social gatherings (Abu Hasan et al., 2022). However, according to the results of students' satisfaction with online distance teaching from the first to sixth semesters of the University of Malaya, Malaysia shows that there are many difficulties in the transformation of the distance online teaching mode, such as poor network connection, lack of understanding of online teaching and learning, and insufficient facilities etc. However, most students are satisfied with the teaching platform used in online courses. It is hoped that in the future online distance teaching, the teaching platform can be optimized to bring a better remote online learning experience. (Mohamad Kamil, 2022).

New understanding of open distance online learning. Many factors affect students' satisfaction with the whole online course. Among the many factors that affect satisfaction, teachers' quality, curriculum design, timely feedback and students' expectations are the most important four factors.

It is determined that online distance learning is the most appropriate teaching and convenient method during the covid-19 pandemic, especially for overseas students.

Abdul Rahim et al investigated the self-perceptions of Malaysian pre-university students in the context of covid-19 and discussed the relationship between university counselling and the 2019 coronavirus pandemic. The findings indicated that the main issues facing college prep students were related to their future careers and education; followed by adjustment to school work, personal-psychological relationships, moral and religious psychosocial relationships, health and physical development, family and family, curriculum and teaching Procedures, social and recreational activities, finances, living conditions and employment; and finally romantic relationships, gender relations and marital issues. These findings highlight the importance of considering mentoring and
counselling services to help students in need more specifically to help college prep students ensure that these self-perceived problems do not affect their emotional and academic performance in life. (Abdul Rahim et al., 2020) From the research results of this paper, we can find the following characteristics:

The findings of this article can be used as a guide to carry out planned daily activities in student service at their respective levels.

The research results of this paper can help guide the teaching department to plan the basic level students, and the activities or interventions needed to help students.

It will help the university teaching departments run well, such as the academic department, student affairs department, consulting department, Foundation Center, University boarding college, and finance department, and improve the quality of service.

2.2. The current situation of Students’ employment and Entrepreneurship

The employment of college graduates is getting more difficult year by year. The main factors are the economic downturn and the reduction in the number of jobs under the background of the epidemic (Jia et al., 2021; Li, Tsai, & Sun, 2022). (Jia et al., 2021). Jia et al. investigated the current employment problems of college students from the perspective of professional course learning and current job satisfaction, and conducted return visits and graduate questionnaires, and established an employment situation analysis based on the College Students' employment model. (Jia et al., 2021).

Chinese colleges and universities continue to expand the scale of enrolment, and the number of students in various majors continues to increase, but the number of positions is still limited, which invisibly increases the employment pressure on college students. To alleviate the employment pressure of college students, leaders of functional departments of colleges and universities take activities such as connecting with enterprises and expanding employment positions to effectively help graduates solve common problems in employment channels. (Gong, 2017).

The government, universities and enterprises are actively taking corresponding measures under the situation of College Students' employment difficulties.

Under the background of the epidemic, the current situation of difficult employment for college graduates has been aggravated.

2.3. The added value of intangible cultural heritage to the industry

Intangible cultural heritage is the meaning of life given by history and culture, so it is worth protecting, inheriting and promoting. It carries the history of a country and combines various forms of national protection with efforts to improve legal mechanisms, popularize education and economic development, and maintain the vitality and vitality of culture (Kurin, 2004). This interest in intangible cultural heritage is based on the understanding of its role in shaping national culture, which is not only out of the desire to protect endangered folk customs, but also a way to continue and develop a culture in a new situation (Morsi, 2005).

For the protection of intangible cultural heritage, individuals and non-governmental organizations have made efforts, and have received the support of some government agencies and authorities, such as the folk literature and Art Committee (Zanten, 2001).

At the same time, governments, museum systems and museum professional communities across Africa attach great importance to the protection of intangible cultural heritage (Luby, 2017)

2.4. Humanized product design

In product design, most products attract consumers' attention through their appearance design (Toyong, Abidin, & Mokhtar, 2021). For example: Gorgeous shell, cool shape. The human brain will automatically recognize the information conveyed by-products and integrate this external information, so that this information affects people's thinking (Jamaludin, Zulkapli, & Abidin, 2013). Because designers’ ideas can be used as a form of visual hand-painted expression, different designers have
different. But the ultimate goal of designers is the same. They all need to design humanized products and improve product sales (Abidin, Warell, & Liem).

Humanized design products should consider more factors of interaction design (Abidin, Bjelland, & Øritsland, 2008).

Considering industrial design and interaction design is the basic factor of cultural and creative product design (Abidin, Warell & Liem, 2011).

3. Methodology

This paper adopts the practical research method to carry out the research, which includes two parts: (1) the research of existing brands of cultural and creative products, including existing product types, sales models, etc; (2) According to the questionnaire survey of consumers, we can see which product form consumers prefer.

3.1. Case Selection

This paper adopts practical research, including the research on the existing brands of cultural and creative products, including: cultural and creative products of the Forbidden City, Dun Huan Cultural and creative products, Disney cultural and creative products, scientific and technological cultural and creative products, and cultural and creative products of the giant panda base. Conduct research on the product characteristics, product types and marketing methods of the four cultural and creative products. We select these most representative, best-selling and most well-known cultural and creative products. The purpose is to find the vacant part of the market. In the existing mature cultural and creative product market, find a blank area for design and creation, so that the success rate of obtaining the cultural and creative product market will be higher.

3.2. Consumer questionnaire survey

In designing cultural and creative products, we have adopted the form of a consumer questionnaire survey to carry out targeted research. The questionnaire survey collected 3001 valid data from the questionnaire survey. The 3001-questionnaire data came from the people who are most likely to buy cultural and creative products, including college students, tourists to tourist attractions, art museum visitors, museum visitors and other people.

3001 questionnaires were collected as shown in Table 1 What is your favourite cultural and creative product? including: (1) What is the most reasonable price range for cultural and creative products? (2) What is your favourite cultural and creative products? (3) What is your favourite cultural and creative products? All the research data and the guiding opinions given to this topic.

In terms of research methods, in the case of intangible cultural heritage protection and application, we adopted the boundary object from each field of knowledge, that is, the implicit part of shared knowledge and the external explicit transformation form of implicit knowledge (Suib, Van Engelen, & Crul, 2021).

In the case of the research Party's entrepreneurial start-ups, we chose the successful entrepreneurial case "Xiaomi", which provides an example for the case study method of this topic (Xihui Sylvia Liu 1, 2019).
Table 1. What is your favourite cultural and creative product?

<table>
<thead>
<tr>
<th>Price range</th>
<th>10–20 RMB</th>
<th>21–50 RMB</th>
<th>51–80 RMB</th>
<th>81–100 RMB</th>
<th>&lt;100 RMB</th>
<th>The price does not matter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tick “v”</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. What is your favourite type of cultural and creative product?

<table>
<thead>
<tr>
<th>Product type</th>
<th>Necklace pendant</th>
<th>Food packaging</th>
<th>Stationery/pen/book</th>
<th>Doll/stuffed/toy</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tick “v”</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. What is your favorite cultural and creative product?

<table>
<thead>
<tr>
<th>Product themes</th>
<th>Focus on science</th>
<th>Interested in art</th>
<th>Interested in science</th>
<th>Interested in new energy</th>
<th>Interested in micro world</th>
<th>Interested in nano technology</th>
<th>Interested in artistic illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tick “v”</td>
<td></td>
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</table>

3.3. Design creative products, display, and sale

The design process of cultural and creative products contains 5 steps as shown in Fig. 1. (1) Extracting the most representative element factor of intangible cultural heritage; (2) Building the element borrowing link from the extracted element theme to realize the basic modelling and colour appearance. Add the subjective creativity of designers, not copying; (3) Recreating the element concept based on the designer's knowledge background and reading category. There is no unified formula for this process, which is a constantly changing creative process; (4) Ingeniously integrating design elements with connotation and meaning into creation to express their meaning; (5) Reshaping the relationship between various elements, that is, placing cultural and creative products and ontology elements in the same environment to reconstruct their harmonious relationship, and finally forming a unique cultural and creative design product.

The final designed cultural and creative products will be displayed and sold to help college students start businesses and obtain employment.

![Fig 1. Five steps in the design process of cultural and creative products.](image)

4. Result and Discussion

The following is a discussion on the research project to promote entrepreneurship and employment of college students in the context of the epidemic, mainly focusing on two parts: (1) can the design and promotion of cultural and creative products promote the protection of intangible cultural heritage? (2) With the help of the government and enterprises as the premise, can the sales of cultural and creative products promote the employment mode of college students?
4.1. Cultural and creative product designing

In the stage of market research of cultural and creative products, this topic selected the five most representative types of cultural and creative products. The product name, product type, theme elements, and representative items of each cultural and creative product are shown in Fig. 2, which shows the characteristics of the cultural and creative products of the five brands. The details of the five most representative types of cultural and creative products are as follows:

The cultural creation of the Forbidden City is based on the design characteristics of China's royal architecture and creates Royal stories. Cultural and creative products include bookmarks, food, cosmetics, calendars, and other products.

Dun Huang Cultural Creation is based on Dun Huang Buddhist culture and spreads Buddhist stories. Cultural and creative products include scarves, ice cream, pens, bookmarks and other products.

Nanotechnology cultural and creative products is based on the energy storage and conversion materials, that is, the illustration art is created with the scanned images of nanomaterials, and the concept of green environmental protection to promote the concept of green environmental protection. Cultural and creative products include playing cards, mouse pads, schoolbags, and other products.

Disney-themed cultural and cultural creation is based on the design of Disney-themed films, aiming at the artistic creation of the characters in the films to promote the Disney brand value concept. Cultural and creative products include food, theme parks, water cups, dolls, and other products.

The theme of cultural creation of Chengdu Panda Base is based on the shape characteristics of giant pandas to promote the value concept of animal protection. Cultural and creative products include clothing, theme parks, tourism, dolls, and other products.

In fact, a good cultural and creative product should have the following three advantages: (1) High brand awareness (conducive to later sales, quickly attracting consumers' attention); (2) A certain audience, and even a small group of people are fans of the brand (these people are the first to sell products in the later stage); (3) The culture accumulated for thousands of years has enough background stories to be tapped (cultural content + marketing communication); this advantage can be transformed into a high topic potential and consumption potential in the later stage.

4.2. Questionnaire survey data analysis

The results of the questionnaire survey are shown in Figure 3. We designed a questionnaire survey and collected 3,001 valid questionnaire data feedback results. In this survey, we can see that the price range is targeted. The people who choose the most are actually “it doesn't matter the price, just like it.” It can be seen that when consumers buy cultural and creative products, the most important thing is the design concept, not the price concessions. Therefore, the guiding significance brought to us is to design creative cultural and creative products first, and then control the price of products and improve the quality. In the survey on which types of cultural and creative products are the most popular, we found that the stationery products that are used most frequently are the products that adults most want to buy. In the question on the theme of cultural and creative product design, it can be seen that everyone's favourite themes are art, technology, and culture, so with the support of the above data, it can help us design an excellent cultural and creative product.
Fig 2. The characteristics of the cultural and creative products of the five brands.

<table>
<thead>
<tr>
<th>Number</th>
<th>Cultural and creative products</th>
<th>Product feature</th>
<th>Picture display</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cultural creation of the Forbidden City</td>
<td>cultural deposits, fashion elements, higher cultural added value, royal culture story, increase cultural knowledge</td>
<td>![Picture 1]</td>
</tr>
<tr>
<td>2</td>
<td>Cultural creation of the Dunhuang</td>
<td>buddhist cultural stories, full of traditional art, profound mystery, cultural heritage protection, digital cultural creation</td>
<td>![Picture 2]</td>
</tr>
<tr>
<td>3</td>
<td>Science and technology cultural innovation</td>
<td>green environmental protection concept, nanometer materials, popularize the concept of new energy, protect the home</td>
<td>![Picture 3]</td>
</tr>
<tr>
<td>4</td>
<td>Theme park culture and creation</td>
<td>disney company, film and television industry, disney park, derivative consumer goods, franchise right</td>
<td>![Picture 4]</td>
</tr>
<tr>
<td>5</td>
<td>Cultural creation of the panda base park</td>
<td>natural scenery, black and white, love to protect animals, animals under first-class protection</td>
<td>![Picture 5]</td>
</tr>
</tbody>
</table>

Fig 3. The results of the questionnaire on what forms of cultural and creative products.
The cultural and creative products designed in this paper are obtained using the five-step method (Fig. 1). Our subject of cultural and creative products selected the most famous "Qin Bricks and Han tiles" in the list of intangible cultural heritage protection in Xi'an, Shaanxi Province, China (Fig. 4a). After reshaping and integrating current elements, the Art and design students created the final new types of cultural and creative products (Fig. 4b). Although the creation of cultural and creative products filled the gap in the design of cultural and creative products with the theme of "Qin Bricks and Han tiles", which is the innovation of the wok, it cannot cover all cultural and creative products of intangible cultural heritage. More importantly, the construction of cultural and creative products can play a positive role in promoting the protection of intangible cultural heritage, and also allow buyers and recipients to increase the inheritance and dissemination of culture based on the value of the original gifts. It is an effective way to combine design and application to transform the protection of intangible cultural heritage into economic value.

4.3. Help students expand employment methods

In this paper, when studying the path to help college students' entrepreneurship and employment, the work relied on the school-enterprise cooperation platform to display the sales and show the sales exhibition designed by the college graduates. Under the epidemic situation, under the premise of good epidemic prevention measures, it is also a new model created by the government and enterprises to help students sell their graduation design works in the form of exhibitions. In the exploration of such a model, can we test whether such a model of College Students' independent entrepreneurship and employment is feasible? If such a model can generate good economic benefits and help college graduates gain economic income, the government can open up entrepreneurial blocks, implement tax
cuts, rent cuts, water and electricity cuts, encourage and help college graduates start businesses and create new jobs model. If such a creative exhibition cannot achieve good sales, such sales experience and practical training are also a work experience for students.

Figure 5 presents the display and sales site of the cultural and creative products we designed. With the help and support of the government, the cultural and creative products designed and produced will be displayed at exhibitions jointly organized by the government and enterprises to help college students start businesses and obtain employment. Especially during the epidemic, such activities are particularly important for college graduates. The main products sold at the fair are cultural and creative products, artworks, handicrafts, paintings, etc. designed and developed by college students. Among the many college student booths on sale, only the products that are beautifully designed and well-crafted can be competitive. Especially for cultural and creative product forms, such as scarves, mouse pads, ceramic plates, tapes, notebooks, etc. have good sales and praise.

The "Qin Bricks and Han Tile" cultural and creative products in this design research are the graduation design works of the students of the research group, and at the same time, they have also become cultural and creative products that can be sold. According to the actual sales data, for the cultural and creative products of our research group, a college student's entrepreneurial sales booth can earn $150 during the sales period from 8:00 am to 12:00 am, which is enough to guarantee the living cost of a college student afterward, graduate.

5. Conclusion

The four research questions designed at the beginning of this paper have been fully proved by data in the research process. Based on the concept of intangible cultural heritage protection, a cultural and creative product with the cultural characteristics of Xi’an, Shaanxi Province is designed. Finally, the cultural and creative products designed by this project will be sold through a trade fair platform jointly built by the government and private enterprises to help college students start businesses and find jobs. It has helped college graduates develop a new employment model and path, and effectively solve the difficult problem of employment under the background of the epidemic. The research on this topic not only protects intangible cultural heritage, but also helps students expand employment. It has opened a road of innovation and entrepreneurship education for art and design college graduates.
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