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Factors influencing the selection of outstanding craftsmen in art and design education

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ABSTRACT

The purpose of this research is to explore the influencing factors in the selection of outstanding craftsmen among vocational college art and design students. This paper selected the case studies of art majors and collected data on the school performance of 222 students majoring in art and design. Convenience sampling was used to select the sample, which was grouped based on whether or not they had been selected as school-level outstanding craftsmen. The study compares the mean values of variables such as entrance exam scores, in-school comprehensive assessment scores, volunteer service hours, possession of vocational qualifications, gender, single-child status, party membership, and employment rates between the two groups of students. Interviews were also conducted, and SPSS software was used for the data analysis. The research found significant differences between the student group selected as school-level outstanding craftsmen and the student group not selected as school-level outstanding craftsmen regarding the in-school comprehensive assessment scores, volunteer service hours, gender, and party membership. These findings provide support for further optimizing the selection criteria and offer empirical references for the cultivation path and evaluation system of craftsmanship spirit among art students.

Contribution/Originality: This study contributes to the existing literature on the selection criteria for outstanding craftsmen among vocational college students. The paper's primary contribution is its study of the influencing factors in the evaluation and selection of students with excellent craftsmanship in the art major.

1. INTRODUCTION

Craftsmanship spirit is a quality characterized by precision, diligence, perseverance, and innovation. It embodies an individual's professional beliefs, qualities, and capabilities (Wang, 2022) and plays a significant role in the long history of human civilization (Shen, 2022). Since the advent of the Industry 4.0 era, many countries have elevated technological innovation and high-quality development to a national strategy level (Yang & Gu, 2021). The development of various industries relies on the many technical professionals working on the front lines. China's manufacturing industry, as a whole, still faces the stage of being 'big but not strong,' with structural surplus, shortages in talent, and issues related to product quality coexisting (Wu, 2018). Therefore, the cultivation of more craftsmen with a spirit of continuous improvement has become a contemporary imperative. Vocational colleges as primary training grounds for nurturing skilled workers in a large country (Huang, 2016) have been exploring how to cultivate craftsmanship spirit in students while considering the unique characteristics of their respective disciplines. This has been one of the research directions

for many scholars (Fang, Jia, Zhen, & Junwei, 2017; Lu, Geng, & Zhang, 2022; Sun, 2021; Tong, Wang, & Ye, 2016; Xi, 2019).

Art and design skill-based talents refer to individuals in the art and design industry who possess exceptional skills, proficiency in operations, and innovative qualities in both design and production (Xi, 2019). The cultivation and selection of outstanding craftsmen among vocational college art and design major students lack a unified and fixed model and standard. Therefore, research on the influencing factors holds practical significance. Previous studies have predominantly focused on theoretical explanations of the cultivation and assessment of craftsmanship spirit among art and design students. There is an urgent need to conduct research that combines theoretical concepts with empirical validation (Fan, 2020; Huang, 2017; Xi, 2019; Yi, Zhu, & Shao, 2020). This study aims to explore the influencing factors in the selection of outstanding craftsmen among vocational college art and design students, providing empirical validation and references regarding the effectiveness of cultivating craftsmanship spirit in art and design major students at vocational colleges.

When it comes to research on the development of comprehensive vocational competence in various countries worldwide, there is debate in regions such as Europe and North America regarding the possibility of cultivating vocational attitudes, including the development of craftsmanship spirit. This study first discusses whether craftsmanship spirit can be cultivated and supports the viewpoint that craftsmanship spirit can be developed postnatally. Secondly, through a review of previous literature on the influencing factors and assessment of craftsmanship spirit cultivation among vocational college students, it explores the supplementary aspects of research on the selection of art and design students with craftsmanship spirit. Finally, through a survey and data analysis of the selection of outstanding craftsmen among art and design students, it seeks to explore the factors influencing their evaluation, with the aim of providing data support for the optimization of cultivation models and evaluation standards.

2. LITERATURE REVIEW

Different scholars have held varying views on the definition and essence of craftsmanship spirit during different periods (Blair, Blair, & Ramsay, 1991; Li, 2020; Nylund & Gudmundson, 2017; Stow, 1942; Wang & Wang, 2017; Warren & Edelstein, 1966; Wood, Rust, & Horne, 2009; Wu, 2021; Yanagi & Leach, 1989). The focus of Japanese craftsmen, the precision of German craftsmen, and the innovation of American craftsmen have all become significant advantages contributing to the high-quality development of their respective country's manufacturing industries. However, there is still controversy in the academic community about whether the spirit of craftsmanship can be cultivated.

2.1. Can Craftsmanship Spirit Be Cultivated?

Some Western scholars hold the view that vocational attitudes, including craftsmanship spirit, are either not trainable or are challenging to train. For instance, Spencer, McClelland, and Spencer (1994) suggested that aspects of vocational qualities beyond knowledge and skills, such as values and self-awareness, reside in the latent part of competence models and are difficult to acquire through postnatal training. Weber and Kalberg (2013) argued that vocational ethics and craftsmanship spirit do not universally exist but rather develop under specific historical and cultural conditions. Furnham and Eysenck (2002) indicated that early experiences and personality traits are closely related to job performance, and the displayed work attitude only represents the tip of the iceberg of internal vocational qualities or personal potential. Whether one can experience happiness in their work varies from person to person (Seligman & Csikszentmihalyi, 2000). However, some scholars believe that because explicit qualities only represent the tip of the iceberg, efforts should be made to stimulate and cultivate hidden vocational qualities. This perspective is similar to the idea that intelligence is innate, just like the intelligence quotient (IQ), but emotional intelligence (emotional quotient/EQ) can be nurtured postnatally (Goleman, Boyatzis, & McKee, 2013). In research on students' comprehensive vocational competence, there is a significant body of work suggesting that increasing practical

training and hands-on opportunities can enhance vocational competence (Associates, 2015; DeWitt, 2012; Gardner & Van Der Veer, 1998; Kuh, 2008; Muñiz & Eimerbrink, 2018).

This study supports the viewpoint that vocational college students have sustainable development potential (Xiao & Zhu, 2009), and with the coordinated collaboration of various educational resources, the cultivation of craftsmanship spirit is necessary and feasible. Therefore, this study proposes the following hypothesis: In the selection process of outstanding craftsmen among art and design students, there is a significant correlation between students' entrance exam scores, their initial performance in terms of vocational competence, and whether they are recognized as outstanding craftsmen upon graduating.

2.2. Factors Influencing the Cultivation of Craftsmanship Spirit

In existing research on the factors influencing the cultivation of craftsmanship spirit, some scholars have conducted surveys through case analyses. For example, research has been carried out in an Italian district of luxury leather production, and a "craftsmanship index" was defined in order to assign a concrete value to the artisanal competences. Four factors contribute to the craftsmanship index: Craft skills; creativity skills; culture, history and tradition; and territory vocation (Campana, Cimatti, & Melosi, 2016). Qualitative research has also been conducted on the growth experiences of Chinese contestants who have won awards at World Skills competitions. This research utilized open coding, axial coding, and selective coding techniques (Strauss & Corbin, 1998) to explore the participants' competition experiences and the influencing factors. Some studies have focused on apprenticeship, emphasizing the significant role of mentors in cultivating craftsmanship spirit (Zhang & Cerdin, 2020). Mills (2004), in his work on intellectual craftsmanship, emphasized the importance of pursuing excellence in craftsmanship spirit for intellectual workers and the crucial role of social practice and personal reflection. Chen, Xu, Zhu, Sun, and Lu (2019) conducted an analysis of the factors influencing craftsmanship spirit among construction workers. A regression analysis using stepwise regression revealed that the employment mode of enterprises was the most significant factor affecting craftsmanship spirit. Job satisfaction, education level, and annual income also had positive effects on the development of workers' craftsmanship spirit. Furthermore, Zuo, Li, and Yu (2022) conducted cross-regional research and found significant differences in craftsmanship spirit among skills in different regions and industries. School factors had a relatively significant impact on the craftsmanship spirit among manufacturing industry skills in various regions. Research by scholars such as Xu (2018) and Huang (2020) used questionnaire surveys and interviews with selected vocational colleges as examples to construct data models for the cultivation of craftsmanship spirit. It's evident that the influencing factors of craftsmanship spirit cultivation differ based on region, industry, and major. In terms of the overall quantity of existing literature on craftsmanship spirit, theoretical research on its definition, importance, and status analysis still makes up a significant portion, while empirical research remains relatively scarce. The research on influencing factors predominantly focuses on the manufacturing industry and lacks comprehensiveness, leading to a disconnect between theoretical research and practical application (Cao, 2017).

2.3. The Assessment of Outstanding Craftsmen

Regarding the evaluation research on craftsmanship spirit, Li, Shang, and Qin (2022) constructed an evaluation index system for the cultivation of craftsmanship spirit in vocational colleges. This system consists of four dimensions: professional skills, innovation ability, vocational ethics, and psychological qualities, comprising a total of 13 secondary indicators. Lei (2022) conducted a detailed evaluation of indicators from four aspects: ideological and political courses, professional theoretical courses, professional practical courses, and on-the-job internship courses. Deng and Liu (2023) conducted a comprehensive literature review and pointed out that existing research is often abstract or provides a descriptive analysis but lacks a strictly normative exploratory research process. Wei (2019) included 21 tertiary indicators in his developmental evaluation research, covering various aspects of students' daily behavior, such as course learning, daily behavior observation, collective labor, class work, and club activities.

Overall, research on the evaluation of craftsmanship spirit cultivation among vocational college students is still lacking. Due to the differing characteristics of various industries and majors, existing research often refines evaluation indicators based on the regions sampled or schools surveyed. There is currently no unified standardized evaluation system or criteria in place.

3. METHODOLOGY

3.1 Participants

The participants comprise 222 students majoring in art and design who attended Jinan Vocational College from 2020 to 2023. Jinan Vocational College is one of the seven key vocational colleges in Shandong Province, China. A quantitative analysis was conducted on the basic information and three years of on-campus performance data of the 222 students. The data includes entrance exam scores, comprehensive in-school assessment scores, hours spent doing volunteer work, whether they obtained vocational qualifications, gender, hometown, whether they are only children, whether they are members of the Communist Party or Communist Youth League, employment destinations, and more. The study compares the variable means of the 23 students who received the school-level Outstanding Craftsman title with the means of those who did not receive it. Additionally, interviews were conducted to analyze the factors influencing the selection of outstanding craftsmen among vocational art students.

3.2 Design and Procedure

In order to obtain more authentic and valid data, this study adopted a convenient sampling method to select the sample. The data was collected with the consent of the teachers and students in the sample school, and the results will help the school analyze and judge whether the criteria for the selection of outstanding craftsmen are reasonable. The primary study criterion for identifying graduates who should receive the title of outstanding craftsmen is that the students must have completed at least two practical training courses representing core skills in their respective majors as designated Craftsmanship Standard Courses. The formal examination scores for these Craftsmanship Standard Courses, along with students' performance during on-the-job internships, social practices, campus-level skill competitions, and their demonstration of "craftsmanship spirit" and "craftsmanship skills" in their daily studies, are considered. The evaluation criteria for recognition in the specific major are then established, and an overall score is assigned based on these factors.

This is a case study of a particular major in which 222 students majoring in art and design were selected as professional cases for the analysis of sample information and school performance data. Data analysis was conducted using SPSS 25.0 and JASP (a statistical software), and the students were grouped based on who received the school-level Outstanding Craftsman title (23 individuals) and those who did not receive the title (199 individuals). Independent sample T-tests were performed separately for gender, entrance exam scores, average in-school comprehensive performance scores, hometown, whether they are only children, whether they obtained vocational qualifications, employment status at graduation, party membership, and total volunteer hours, with a focus on whether they were awarded the title of Outstanding Craftsman. The analysis also incorporated observations of the students' performance over their three years in school. Descriptive statistics of the student sample demographics are presented in Table 1.

Table 1. Descriptive statistics of student sample demographics (N = 222).

Index	Category	N	Proportion
Gender	Male	92	41.4
	Female	130	58.6
Place of origin of students	Urban	47	21.2
	Rural	175	78.8
Single-child status	Yes	45	20.3
	No	177	79.7

Index	Category	N	Proportion
College major	Art design	94	42.3
	Environmental art design	89	40.1
	Digital media art design	39	17.6
Political affiliation	Probationary member of the Communist Party of China	18	8.1
	Member of the Communist Youth League of China	65	29.3
	The masses	139	62.6
Received the title of 'Outstanding Craftsman'	Yes	23	10.4
	No	199	9.6
Graduate placement	Formal employment by signing a labor contract	107	48.2
	Formal employment by signing an employment agreement	10	4.5
	Pursuing further education (Bachelor's degree)	91	41.0
	Conscripted soldiers	4	1.8
	Self-employment	1	0.5
	Flexible employment	4	1.8
	Awaiting employment	5	2.3
Grade	Junior year	222	100.0

4. RESULTS ANALYSIS

The study conducted group comparisons between the students who were awarded the title of 'Outstanding Craftsman' (N = 23) and the students who did not receive the title (N = 199). It was hypothesized that there were significant differences in gender, entrance scores, in-school average grades, place of origin, being an only child, obtaining vocational qualifications, post-graduation destinations, employment status at graduation, party or youth league membership, and total volunteer hours, between the two groups based on the 'Outstanding Craftsman' status. Independent sample T-tests were conducted for each variable and the results are as follows:

Table 2. Independent sample T-test for gender with 'Outstanding Craftsman' status.

Index	Test	Statistic	df	p	Cohen's d	SE Cohen's d
Gender	Student	-2.496	220.000	0.013	-0.550	0.222
	Welch	-3.043	31.069	0.005	-0.601	0.222

Note: SE = Standard error.

Table 3. Group descriptives.

Index	Group	N	Mean	SD	SE	Coefficient of variation
Gender	Not awarded	199	1.558	0.498	0.035	0.320
	Awarded	23	1.826	0.388	0.081	0.212

The results of the independent sample t-tests, shown in Tables 2 and 3, revealed that there was a significant difference in gender among vocational college students in terms of 'Outstanding Craftsman' status, with females (coded as 2) surpassing males (coded as 1). This difference was even more pronounced within the 'Awarded' group. The t-statistic is $t(31.069) = 3.043$, $p = 0.005$, with an effect size of $d = 0.601$ (medium). In SPSS, SD is the standard deviation, and SE is the standard error. In the data collation process, these two indicators are usually used to show the distribution and statistical significance of the data. The Welch test is a statistical test used to determine whether there is a significant difference between the mean values of two groups. N is the number of individuals sampled, and the p-value represents the significance level.

Table 4. Independent sample t-test for the mean in-school scores with 'Outstanding Craftsman' status.

Index	Test	Statistic	df	p	Cohen's d	SE Cohen's d
Average score	Student	-7.705	220.000	< 0.001	-1.697	0.236
	Welch	-18.390	130.378	< 0.001	-2.217	0.247

Table 5. Group descriptives.

Index	Group	N	Mean	SD	SE	Coefficient of variation
Average score	Not awarded	199	85.570	3.098	0.220	0.036
	Awarded	23	90.574	0.771	0.161	0.009

The results of independent sample t-tests, shown in Tables 4 and 5, indicate that there is a significant difference in the mean in-school scores among the vocational college students based on their 'Outstanding Craftsman' status. Students who were awarded the 'Outstanding Craftsman' title had significantly higher mean scores compared to those who were not awarded the title. The t-statistic is $t(130.378) = 18.390$, $p = 0.001$, with an effect size of $d = 2.217$ (large).

Table 6. Independent sample t-test for party or youth league membership with 'Outstanding Craftsman' status.

Index	Test	Statistic	df	p	Cohen's d	SE Cohen's d
Party or youth league membership status	Student	-3.443	220.000	< 0.001	-0.758	0.223
	Welch	-3.462	27.417	0.002	-0.760	0.224

Table 7. Group descriptives.

Index	Group	N	Mean	SD	SE	Coefficient of variation
Party or youth league membership status	Not awarded	199	0.337	0.474	0.034	1.407
	Awarded	23	0.696	0.470	0.098	0.676

The results of the independent sample t-tests, shown in Tables 6 and 7, reveal a significant difference in party or youth league membership status in relation to the 'Outstanding Craftsman' status. The proportion of students who are party or youth league members and received the 'Outstanding Craftsman' title is significantly higher than that of non-members. The t-statistic is $t(27.417) = 3.462$, $p = 0.002$, with an effect size of $d = 0.760$ (medium).

Table 8. Independent sample t-test for total volunteer hours with 'Outstanding Craftsman' status.

Index	Test	Statistic	df	p	Cohen's d	SE Cohen's d
Total volunteer hours	Student	-6.291	220.000	< 0.001	-1.385	0.231
	Welch	-2.817	22.463	0.010	-0.800	0.224

Table 9. Group descriptives.

Index	Group	N	Mean	SD	SE	Coefficient of variation
Total volunteer hours	Not awarded	199	15.673	23.428	1.661	1.495
	Awarded	23	61.609	77.797	16.222	1.263

The results of the independent sample t-tests, shown in Tables 8 and 9, indicate a significant difference in total volunteer hours concerning 'Outstanding Craftsman' status. Students who were awarded the 'Outstanding Craftsman' title have a significantly higher total of volunteer hours during their school years compared to the students who did not receive the title. The t-statistic is $t(22.463) = 2.817$, $p = 0.010$, with an effect size of $d = 0.8$ (large).

Table 10. Independent sample t-tests for place of origin, single-child status, vocational qualification, employment at graduation, and entrance scores with 'Outstanding Craftsman' status.

Index	Test	Statistic	df	p
Place of origin of students	Student	-0.607	220.000	0.544
	Welch	-0.560	26.317	0.580
Single-child status	Student	0.908	220.000	0.365
	Welch	1.041	29.675	0.306
Obtaining a professional qualification certificate	Student	-1.202	219.000	0.231
	Welch	-1.528	30.221	0.137
Employment status at graduation	Student	-1.234	220.000	0.218
	Welch	-1.158	26.513	0.257
Entrance scores	Student	-1.727	220.000	0.086
	Welch	-1.363	24.867	0.185

The results of the independent sample t-tests, shown in Table 10, indicate that there are no statistically significant differences in the place of origin, single-child status, vocational qualification, employment at graduation, and entrance score means among vocational college students based on their 'Outstanding Craftsman' status. Whether or not they were awarded the title of Outstanding Craftsman does not have an impact on the employment status of students upon graduation.

5. DISCUSSION

This study conducted research based on the results of the Outstanding Craftsman selection at the sampled school, which had criteria that placed a greater emphasis on students' on-campus performance. The criteria leaned toward assessing behaviors, learning attitudes, diligence, precision, and academic performance as they have specificity. The evaluation criteria for craftsmanship spirit among vocational college students majoring in art and design are difficult to standardize and make uniform.

The cultivation of craftsmanship spirit encompasses both pre-employment and post-employment phases. From the perspective of sustainable development, every student has unlimited potential, and pre-employment training is just one stage in this process. Additionally, the cultivation of students' craftsmanship spirit is a systematic process that requires collaboration from multiple stakeholders. The evaluation criteria also include individual, school, industry, and societal aspects, while this study primarily focused on the school-level perspective.

6. CONCLUSIONS

Based on the individual interviews with the participants and observations of their daily on-campus performances, this study draws the following conclusions:

Firstly, vocational college students possess sustainable development potential, and craftsmanship spirit can be cultivated. The data comparison showed that a student's entrance scores have no impact on whether or not they are awarded the title of 'Outstanding Craftsman.' Combined with the synergistic coordination of various educational resources, a student's growth and progress are achieved through continuous effort over their three years at school. The enhancement of students' comprehensive vocational qualities and the cultivation of craftsmanship spirit are both necessary and achievable.

Secondly, for vocational college students majoring in art and design, the factors affecting the school-level 'Outstanding Craftsman' assessment place a relatively strong emphasis on process-oriented evaluation, effectively reflecting students' overall competency. Through the on-site investigations, it was found that the composition of the three-year average in-school performance includes both academic achievements and conduct assessment items related to daily on-campus behavior. This serves as a comprehensive reflection of students' performance in terms of moral, intellectual, physical, artistic, and labor aspects. The significant differences in the accumulated hours of volunteer service over three years in obtaining the 'Outstanding Craftsman' title indicate that awardees have a stronger willingness and greater initiative to participate in voluntary services. This aligns with the intensity of social

responsibility, dedication, and active engagement in community service cultivated by craftsmanship spirit. Additionally, through observations, this study also discovered that awardees have taken on various roles in class or school-level student affairs, indirectly suggesting that assuming student leadership positions contributes to the enhancement of students' craftsmanship abilities.

Finally, in the school-level 'Outstanding Craftsman' assessment for vocational college students majoring in art and design, females hold an advantageous position, and party or youth league members also have an advantageous position. Among the students awarded the title, females account for 82.6%, and party or youth league members account for 69.6%. Combining the observations of on-campus behavior, the study found that females outperformed males in academic achievements and daily conduct assessments. They demonstrated greater diligence and attention to knowledge and skill learning, place a higher value on academic and conduct quantitative assessment scores, are more willing to comply with school regulations, and strive to meet evaluation criteria and requirements. Therefore, they also excel in their average in-school performance. Party or youth league member students also have a comparative advantage in the selection process. In general, Party or youth league members tend to be more self-disciplined and service-oriented, which aligns with the persistent dedication spirit inherent in craftsmanship spirit.

7. IMPLICATIONS

This study provides data support for the formulation of the basis for the selection of outstanding craftsmen for students in higher vocational schools. It provides an empirical reference for the cultivation and evaluation of the craftsman spirit of art students in higher vocational education. Through the results, it can be seen that the case school attaches more importance to the process assessment when selecting students with outstanding craftsmanship, such as the average grades of students after admission, the number of hours spent in volunteer services, and the situation of students serving as student cadres, which can be used as important indicators for the selection of outstanding craftsmen.

On the other hand, this study also confirms the sustainable development of higher vocational education students. There was no significant correlation between a student's entry performance and the final designation as an outstanding craftsman. Students are malleable and growing, and the differences in admission does not represent the difference in the students at graduation, let alone the future development trend of students. To a certain extent, it also confirms the cultivability of the craftsman spirit.

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