

Enhancing Industry-Academia Collaboration in Art and Design Vocational Education in China: Bridging the Gap

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Abstract: During the past decades, vocational education in China has experienced tremendously fast growth and a quick reform in production areas, particularly in creative fields such as artwork and design. A summary expounding 50 studies is written to assess whether art and design curricula in Chinese vocational colleges are based on their design, pedagogy, industry relations, and graduate hiring [12]. The review shows that despite a rise in the number of vocational art and design students, far-ranging challenges concerning the disparate deployment of teaching resources, imbalanced curriculum coverage and gaps in cross-cutting of practical training and technology skills, difficulties in making graduates proper fit for career purposes, and partial hitches with industry needs still exist [35]. The proposals include short-term creative tutoring gain, excellent career services, school-enterprise partnership support through material incentives, and long-term result tracking. The government's proposition to channel its funding towards a holistic improvement of vocational education's quality and interconnectivity is a significant step towards forming an intellectually capable working class that is mainly fit to meet the changing market rates [25]. The review is built upon previous studies to disseminate such information to policymakers and employers to assist in developing vocational training in China's constantly changing economy.

1. Introduction

Since the beginning of reforms in the 1990s, China has experienced a significant development of its higher vocational education education. The number of students enrolled in these programs has increased from approximately 3 million in 1978 to over 23 million by the year 2020 [43]. Many specialized colleges have been established for a long time to be ready for the labor market requirements and to accommodate the increase in the pool of higher vocational education, as some researchers indicated [23]. The favorable government policies and investments and the growing awareness and demand for renewable energy systems and equipment support this growth trend [51].

Into this recent period, priorities have become centered around emerging economic fields like information technology, digital creative arts, culture, tourism, sports, and other service sectors, which have rapidly gained great economic significance [14,35]. Through a revolutionary period, the older movement had been in the hands of work industries, and yet, recent changes have shifted the emphasis on new fields like these.

Ahmed et al. (2016) highlights the need for closer collaboration between academia and industry to align curriculum with market needs in information and communication technology fields [1]. The authors argue that sharing knowledge contributes significantly to socio-economic development and marketability, emphasizing the importance of access to academia, human resources development, and understanding market needs.

A considerable amount of creative careers, represented through art and design programs, is in high demand [34]. However, the statistics indicated a tendency towards the growth of employment and vocational education opportunities in the arts and sports domains. According to the data by Chen, in 2012, art, sports, and culture majors, they made up 23% of the total number of higher vocational education programs [6]. The population of college students who make their majors as arts has increased to 144% over the last ten years; this shall reach at least 800 000 of the total vocational students, including career areas such as tourism design, exhibition design, visual displays, and various product designs by the end of this decade [4]. Through the lens of the policy intentions to change the structure of the national economy into innovation and high-value services, further studies and career goals of students in those fields will persist even more [50].

Some aspects of the training process must be clarified, and more attention must be invested in studying how applicable models for students are and how compatible they are with market needs [8, 40]. However, there have been evident weaknesses, as this field of education has yet to be given due attention to the government. Therefore, following the system's quick expansion to meet the mounting demand, it may be possible to identify areas for improvement in the resources provided and the curriculum used, which are insufficient to produce graduates well-prepared to tackle the challenging area of creativity [36]. The main goal of this study is to present a holistic analysis of 50 papers on studying art and design subjects within the Chinese vocational educational system. The following aspects are taken into consideration: hence public policy frameworks for curriculum design, pedagogical quality, connection with industries and employment graduate rates, as well as stakeholder perspectives. The conclusion ultimately comes to the main point of improving vocational education because it promotes the process of industrialization and is the primary purpose of our research as well.

2. Methodology

This search was done by using databases like Google Scholar, ProQuest, Elsevier, and CNKI that are dedicated to academic articles and policy reports, which had been subjected to the peer review process. The following keywords were used in combination with one another: "vocational education," "higher vocational as well as arts and design, creative industries," "curriculum," "teaching," "employment," "careers," "China." The sources were evaluated based on the publishing date that should be after the year 2010 to concentrate on Chinese vocational education, especially art, design and other creative areas.

Fifty sources which consisted of twenty-eight papers from academic journals, five policy reports, two chapters from books, and the rest from other sources were among fifty sources that we carefully studied together [45]. We see education, policy, labour economics and some other social sciences

among the fields covered in the literature in this domain. Analysing various sources I present a diagram showing fundamental elements of the publications examined with an emphasis on well-known details (Table 1).

Specifically, the following sections provide a summary of the primary topics that were extracted from the literature in order to extract them. These themes pertain to the current situation of art and design programs in China as well as vocational education in China. The limitations of the approaches and criticisms of the methods are examined. In conclusion, the consequences and the requirements for further research are discussed.

Table 1: Summary of Literature Reviewed

Author(s)	Year	Methodology	Sample/Data	Key Focus
Chen	2021	Secondary analysis	Education statistics 1981-2018	General overview vocational education reforms
Wang	2022	Historical policy analysis	Reforms since 1990	Government policies, societal attitudes towards vocational education
Autor, Dorn & Hanson	2016	Regression modelling	Trade & manufacturing data	Labor market impact of rising Chinese imports
Cai & Feng	2021	Demographic analysis	Population census data	Societal effect of one-child policy
Flew & Cunningham	2010	Qualitative policy analysis	Creative industry policies	Government support for cultural & creative sectors
Schultheiss, Pfister, Gnehm & Backes-Gellner	2023	Fixed effects modelling	CHIP household surveys, 2002–2016	Education expansion effects on skills & employment
Dai	2019	Qualitative analysis	Applied art & design programs	Training model effectiveness for design occupations
Ling, Chung & Wang	2023	Qualitative comparative analysis	Higher vocational colleges	Management reforms recommended
Wang, Yang & Maresova	2020	Surveys	Students at 4 universities	Student perceptions of sustainability education
Mulkeen, Abdou, Leigh & Ward	2019	Interviews	Degree apprenticeship stakeholders	Perceived challenges in higher vocational programs
Chen et al.	2019	RCT experiment	1,800 senior high students	Embedded vocational courses vs. standard curriculum

3. National Reforms Expanding Vocational Education

After the utilization of market-based reforms in China in the 1990s, it was visible that there was

a considerable difference in the scale and level of stress placed on vocational education [27]. The central planners thought that an expansion of the vocational training space, either by their existing institutions or by setting up new ones, was necessary to keep up with the pace of economic growth and maintain the growing number of youth [6,23,43]. During that period, China used all these instruments to speed up the development of vocational education and increase the number of people studying there [49]. Data on vocational education financing show phenomenal growth from 1990 until 2020, with the authorities' expenses reaching fourfold that of ten years earlier [43].

The growth of the school systems was evident. Over 650 new secondary vocational schools nationwide, from about 1600 institutions in 1978 to a grid above 14,000 by 2020. Nevertheless, the number of students in this system experienced an escalation from almost three million to 23.5 million [6,30]. The expansion of vocational education in China since the 1990s reforms is explored in [2], [28], and [30]. To better its causal effects, the article's authors used the regression technique to estimate that twelve percent of the manufacturing positions decline that demanded a low level of skill from 1990 to 2007 was due to China's increasing exports of manufactured goods and its links with globalization [2]. The other paper concluded by Ling et al. (2023) indicated that the booming vocational education industry. [28] discusses how vocational education and training (VET) must transform to support livelihood opportunities, while [30] provides statistics on China's vocational education growth from 1978-2023.

Significant vocational expansion will not necessarily bring on structural economic transformations but may contribute to the questions of graduates' actual occupation opportunities Feng (2021), Chen (2021), and Schultheiss et al. (2023) cited criticisms that rose and spoke of lack of practical experience, insufficient career advice and ties of curriculum to requirements of the workplace as issues that were counteracting gains that accrued in the labour market because of expansion of this system [21]. Schultheiss and their colleagues implemented a comparison study of the schooling outcomes of the academic and vocational tracks [38]. Data for the study was generated from the CHIP National household surveys from 2002 to 2016. The outcome was as follows: Vocational graduates had higher than average unemployment rates, which indicated the job market's imperfectness and suggested substantial friction in the job market. If the research results are confirmed, one can safely conclude that the government's vocational education reforms have led to higher enrolment rates. However, to improve vocational education, the focus should be redistributed to improve the overall quality of training offered while employing transitional measures.

4. Curriculum Design and Teaching Methods

Since vocational education has developed negatively and positively, the efficiency of training models and the relevance of programs are crucial intermediate factors shaping graduates' skills and future horizons [13]. As a result of some research, the leading ways of vocational institution instruction in China are still academic and theoretical, which is to say, the main modes of vocational education were regular classes and lectures [47]. In contrast, the purpose of vocational education is actually to instruct vocational skills. Chen (2021) noted a massive focus on theoretical information compared to the difficulties faced while applying such information. Besides, Dai (2019) discovered that the two disciplines of applied art and design curricula, although reasonable at teaching problem-solving in real life, needed to be creatively developed more.

Creswell & Creswell (2018) introduces research approaches including qualitative, quantitative, and mixed methods for data collection, analysis, and interpretation [7]. The authors explain that the

choice of approach depends on the research problem, personal experiences, and intended audience. The importance of international research collaboration networks is highlighted in [10]. The authors argue that enhancing science and technology in developing countries is crucial for overcoming challenges, necessitating the involvement of various actors including research centers like Bibliotheca Alexandrina.

Fam Chen et al (2019) carried out a research study that analysed the performance results of 1,800 students of higher vocational education supplied randomly with two forms of courses, the regular curriculum and the vocational one. According to the data, these students reported higher satisfaction levels, and their grades were also excellent or better than those who did not have this content. Moreover, studies proved that technical education delivered in the early stages, as opposed to vocational schools at later ages, tends to motivate students, and thus, essential learning skills are developed [42]. The fact that Mulkeen et al. (2019) conducted interviews with stakeholders in degree apprenticeship programs needs to refute the informer that about only sixteen percent of recent vocational graduates showed the needed practical talents that companies aspired for [32]. Beyond that, Ling et al. (2023) asserted that vocational education disapproved of memorization-based learning, and these methods had nothing to do with the purpose of vocational education to create skill sets that could change as fast as trade methods.

In line with Dai (2019) and Wang et al. (2020), the proposal is aimed at freshening up the teaching process by appealing to progressive case studies and problem-perception-driven learning tailored to the required level. Schools are also noted to establish partnerships with companies, which is widely acknowledged [6,32]. The fact that employees can be supervised and trained right in the company helps businesses provide real-world training and mentorship opportunities. However, it is not the reason for the continuing estranged relationships, as the causes are not legally documented, and such a research gap becomes a puzzle. Along with it, the existing acknowledged exceptional establishment might carry out such progressive ideas, but the degree of the reform implementation will be unfamiliar at a national scale [9]. The research findings confirmed the recommendations below. These findings mean that improving vocational education should focus on systemizing the quality of vocational instruction and building bridges between learning centres and industry needs.

5. The Growth of Arts & Design Programs

Over the past few several years, China has devoted more media and economic resources to the cultural and entertainment industry [14,44]. This phenomenon has been most pronounced over the last several years. Thus, the skill sets used for jobs in the arts, entertainment, digital media, tourism, history, and many more have become relevant and appreciated worldwide. The companies Chen (2021) and Dai (2019), which are visited, indicate a considerable growth in the numbers of those educated in the field of creativity. This is matched with the thought of high demand for such services. According to Chen (2021), as many as twenty-three percent of the students involved in extra-vocational studies will have chosen career fields in the creative and cultural industries by 2012. On the other side, the specific fields of study needed to be specified.

Art-major choice of students is one of the fundamental purposes of creating and implementing a national strategy for education. Cai and Feng (2021) show that from 2010 to 2020, the number of students majoring in the arts increased to 44% and reached 800,000 occupational students. Furthermore, Dai (2019) noted a growth in the number of choir students who opted for consequently designed concentrations like product design, visual communication design, exhibition

design, and tourism design. In the report of Flew and Cunningham (2010), it is revealed that the animation, internet, and gaming industries are all responding to a similar trend as the needs of media arts and the many other jobs that have to do with digital creativity are increasing [14]. This program's research delivers smart and high-demand graduates using their creativity path.

Different from this, Dai (2019) pronounced that the actual curriculum did not comprehensively connect the industry's position in the design area with the school of thought of training creative, practical skills. Such observations were made by the Beijing Technical Artistic vocational school students as well (for instance, Wang et al., 2020), who noted that those students who attended a course that the vocational workers had criticized considered it unsatisfactory in terms of technical expertise, which employers expected. A statistically meaningful spike in students seeking creative majors is an impressive indicator. However, it remains to ensure that students still know how to use that creative curriculum when they graduate into the workforce [18]. It is remarkable that despite the abundance of activity around the field, very few research areas are related to specific creative majors, and networking with industry partners should also be given a higher priority [41].

6. Graduate Employment Outcomes

The crucial debate after the significant weight on skills-based education emerges whether or not alums from vocational schools will achieve better jobs [5]. However, the flip's research side still finds contradictory findings in this area. Employment of graduates from secondary vocational educational institutions has been increasing, too. In 2018, their employment rate reached 96%, according to Chen (2021), more than that of academic higher vocational education and university graduates. However, the path of professional achievements is difficult to detect, so no data is needed to support career growth. Hsiang et al (2014) investigates human resource development in Taiwan's digital content industry through interviews with leading companies [20]. The study examines job varieties, talent levels, core competencies, recruitment, and training methods across industry sectors, aiming to develop a human resource strategy.

This comparison study by Schiltz et al. (2023) showed that higher vocational education graduates had higher unemployment rates than their peers who had undertaken high training from 2002 up to 2016, suggesting that these two groups had different outcomes. Moreover, wage premium for the trade-offs undertaken by students who had trained in a tradeable occupation for which the training had been designed proved unimportant except in a few cases. While there is no question that the labour market experiences a dramatic shortage of vocational skills and talent, the perception might be clouded by some apparent areas of matching and non-matching [46]. In their 2023 work, Ling et al. came to the same conclusion, stating that the relations between school and enterprise continued to be limited and that work-based experience options persisted too scarce, a barrier in passing from classrooms to creative employment. Malaysia (2020) presents a special invite paper from the Asia-Pacific Association for Institutional Research, likely discussing higher education or institutional research topics relevant to the region [26].

Although using large datasets shows that vocational students have a high employment rate, it has been discovered that severe problems, such as skill mismatch and a lack of career advice, lead to ignoring the gains procured from the working world. National Bureau of Statistics of China (2022) introduces statistical classifications and codes used by China's National Bureau of Statistics, potentially relevant for categorizing industries, occupations, or other economic data [33]. Better efficiency in tracking graduate outcomes and increased career assistance can provide adequate service for a smooth transition from school to work [6]. This is because the vocational system of

education is developing its structure and expanding its capacity. The illusion of reform strategies can be achieved after one maximizes national statistics and students' accounts, representing their school paths [37].

7. Discussion

The review has given a recent account of the development of the (Chinese vocational education system) (creative arts and design programs), focusing on the latter's rapid growth. The outcomes of the analysis is the recognition of a complex dynamic in nature of the socioeconomic environment in which both benefits and shortcoming are apparent and requires hard work to resolve this issue.

8. Vocational Expansion Outpacing Capacity Upgrades

On the flip side, vocational education reforms, which have been ongoing since the late 1980s, have dramatically expanded enrolment, created space for employment absorption of the growing population, and ensured the economic restructuring towards emerging digital and creative sectors [6,14]. With electrical policy backing and precondition investments, vocational schools nationwide were established with the necessary infrastructure. They incorporated a variety of fields that consider the vocational demand of future employment. This process went beyond the traditional manufacturing trades [23, 43]. The arts, design, tourism, sports, and technology disciplines have become China's primary developmental trends as the government's policies turn to the growth of the cultural and creative economies [4, 8].

Nevertheless, these analyses almost uniformly spurn a need for more appropriateness in simultaneously enrolling more excellent students while the existing training capacity cannot match their level [32, 40]. Since the demand for advanced technical skills in different fields continues to grow, the situation where the teaching capabilities of diversified educational levels and practical experiences are less available for most people may become a problem in the labour market [22]. To this end, empirical surveys fall short of delivering much wage premium accrued to vocational colleges compared to the academic stream, and the instances of friction in employment are persistent even with pressing labour shortage [24] hence that brings additional prospects but the sustainability of such innovation's premises on quality based stakeholder inputs.

9. Vocational Expansion Outpacing Capacity Upgrades

Fundamentalization and modernization of the curriculum with time-winding industry-specific characteristics are as crucial as achieving the workforce skilfulness goal. Nevertheless, the characteristics of traditional teacher-centered teaching are typically loaded with theoretical facts with difficulties in living up to contexts and situations of real professionals [8]. The divergence towards investigatory-based instructional methods, where students are encouraged to participate in real-life scenarios, case studies, and simulations, will result in topics that will be relevant and engaging [24]. Moreover, incorporating digital literacy modules devoted to flexibility is also of great importance since contemporary occupations mostly use a range of technology skills [19].

10. Incentivizing School-Business Collaborations

Companies in various sectors can directly support such a teaching method by participating in developing the curricula and providing software and equipment, providing a place for onsite

practicums, and other means [23]. Most vocational programs have yet to succeed in forging broad partnerships, although this has been repeatedly encouraged. Sayfullayeva (2021) presents opportunities for teaching disciplines using innovative technologies in technical institutions, examining the concept of innovation in education and its impact on teacher competence and student learning activities [39]. This analyses regarding the fact that the context of the location should be taken into account are crucial for deciding which mound is hindering the growth and whether governing bodies and companies are willing to be engaged [17]. The accountability measures must be implemented as a policy priority, allowing the students to acquire the skills via the knowledge gained in their internships or apprenticeships.

11. Reinforcing Employment Services Support

Through participation in designing curricula, giving softwares and equipment, and leading practicums onsite and with other channels, businesses in the industry domain can help complement teaching in such a way [23]. Among available vocational programs, one must notice strong relations frequently, where there is much pressure for them to be the forces [29]. The constraints that limit the creation and dispersion of the patent must be uncovered honestly. Moreover, precisely the other way around, the engagement of company and regional institutions should be incentivized. For that, the research needs to take place while considering specific conditions [3]. Supporting students in manifesting and embodying the knowledge they acquired for internships and apprenticeships should be a governmental goal with governance mechanisms put in place.

12. Adapting Global Best Practices to Local Needs

Moreover, societal acceptance of vocational education is typical of the developed model countries of Switzerland and Germany. Vocational training is a parallel system to higher education and has high social prestige rather than a final choice after higher vocational education. However, practical skills training is not a priority among social goals in the West. Hence, it is very different from the Chinese context, where the utility of work-related training is underestimated in many educational options [11]. It could be helpful to apply, for instance, features like collaborative curriculum design, intense work-based learning components, and career counselling since these could be valuable in terms of rendering programs more sensitive to different countries [48].

13. Sustaining Reforms with Supportive Policy Frameworks

These plans are only possible in case of continuous policy commitment and control over the administrative workforce, government, manufacturing units, and educational institutions. Ling et al. (2023) highlight the rigidity of bureaucracy and its tendency to use a standardized management approach, which often does not cater to diverse regional needs. Schultheiss (2023) studies how education expansion affects job opportunities and skills requirements for workers with and without the new education level. The authors use machine learning on job advertisement data, finding upskilling in job content and task spillovers to middle-skilled workers in regions with new Universities of Applied Sciences [40]. An increased focus on a more distributed model of government, which facilitates local partnerships and provisions to accommodate labour considerations, can spark innovation [31]. Steadfastness towards the budget allocation of teaching aids and technology, specifically in the less-developed provinces that are far away from the central cities, is pivotal to preventing the widening skills gap throughout the country [44].

Along with the economy in China, which is upgrading towards a knowledge-based economy, the competition from other enterprises would eventually move to discovering and implementing new technologies, building a platform for creating exciting content, and incorporating high-end services. Vocational channels provide a highly effective pathway to reskill and upskill the younger generation to ensure adaptability in occupations that are affected by the changing nature of work [16]. By evolving the recently implemented strategies towards a proven measurement of gaps in outcome based on data, the educational pathways will be more robust.

14. Conclusion

The research incorporated in this review study was about 50 works elaborating on the evolution of Chinese vocational education, especially the rapid emergence of creative arts and design programs. This assessment manifests that the increase in the number of enrolled students and the challenges related to the unbalanced quality and amount of teaching assistance between different institutions, the gap in the work-reinforced training, and the difficult transition from school to work life are still taking place [15]. Besides, the talent mismatch is another challenge, specifically the shortage of some scarcely employed skills and the employment oversupply of others. Vocational school policies and administrator collaboration for improving teaching methods, technological infrastructure development, enhancing industry connectivity pipelines, creating career exposure platforms, and graduate employment tracking are valuable mechanisms for ensuring the efficacy of this type of education as labor markets demand a more creatively skilled workforce [28,39]. As the economy develops, which depicts the emergence of highly-skilled workers, creating one that is efficient enough to capture the creative needs has become paramount.

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