



A Case Study of Teacher-Industry Collaborative Teaching Practice in Digital Media Art Design Course at Chinese Higher Vocational Colleges

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ABSTRACT

This study aims to examine how collaborative instructional practices between classroom teachers and industry professionals refine students' learning in digital media art design and teachers' instructional practices. A qualitative case study was applied to draw participants' (classroom teachers, industry professionals, and students) perspectives concerning the impacts of collaborative teaching on teaching and learning refinement. Classroom observations and document analysis were also applied to validate the findings. The findings of the study identify common patterns, effective collaborative practices, and areas for improvement in teachers' instructional practices (such as upgrading learning content using industry standards, implementing project-based learning using real-industry contexts, and emphasizing feedback and assessment on students' performance and portfolios) and students' learning (such as accomplishing tasks using industry procedures, facilitating critical thinking and problem-solving abilities). The study findings provide insights for educators, curriculum designers, and policymakers to optimize the training process and develop well-rounded, highly skilled designers for China's high-tech industrialization, contributing to the growth of its innovation sector.

KEYWORDS

Feedback and assessment; project-based learning; critical thinking; teacher-professional collaboration.

INTRODUCTION

The Information Age of the 21st century has brought digital media as a primary mode of knowledge and awareness sharing. As Chinese President Xi Jinping once said, "Education is the cornerstone of national development" (Zhang et al., 2023), highlighting its importance in the country's transformation and economic development. This is especially true in technical education, which is associated with varying regional economic dynamics. At the same time, driven by developments in technology like big data, AI, and blockchain, the vocational education industry has been expanding. The global vocational education market has been on a rising trend since 2016, and it is expected to reach nearly \$8 trillion by 2026 (Liu & Hardy, 2023). Central to this growth is the indispensable role of digital media art design. Recognizing the importance of meeting modern demands, the Chinese higher vocational education system has implemented digital media art and design programs to respond to the needs of society. However, an important challenge persists: training digital media art designers with both creativity and practical capabilities. This gap is a considerable concern for higher vocational education institutions. In response, G College, one of China's leading higher vocational institutions, has spearheaded efforts to refine the pedagogical approach in the digital media art and design major.

The implementation of digital media in education is not just a technological evolution but an epistemological one—requiring a complete transformation from old to new models of pedagogical practices (Shava, 2022; Suryaman et al., 2023). This is especially essential in digital media art and design, where the rapid pace of technological change demands continuous adaptation and innovation in teaching methods. In China, higher vocational institutions have encountered widespread criticism for being inflexible and failing to meet industry needs. Traditional teaching methods, which prioritize theoretical knowledge over practical skills, are insufficient to prepare vocational college students for the dynamic and highly competitive digital media industry.

Thus, this disconnect between education and industry has created a big talent gap, where higher vocational institution graduates lack the necessary skills and creative thinking needed to succeed in the workplace. Therefore, the purpose of this study is to examine how partnerships between teachers and industry professionals improve students' learning outcomes in art design, technical skills, and creative talent. It examines the development of school teachers' teaching practices when collaborating with industry professionals and its effect on pedagogical effectiveness. Additionally, it seeks to identify and explain the specific benefits students gain from collaborative teaching methods, particularly in artistry development, creativity, technical efficiencies, and industry preparedness. This study provides an in-depth analysis of how collaborative teaching between classroom teachers and industry professional implemented by G College, could improve classroom teachers' instructional content, project based-learning, feedback and assessment, and students' learning enhancement in digital media art design programs in higher vocational education in Chinese higher education context. It is

anticipated that the study findings will help design more effective instructional practices, ensuring students are better prepared for employment in the digital media industry and improving the education-to-work transition.

LITERATURE REVIEW

Teacher-Industry Professionals Collaboration: Theoretical Framework

The theoretical framework of the study is constructed based on constructivist theory, which originated in cognitive psychology, has evolved into a comprehensive system of learning theories that considerably affect educational practices. Initially proposed by Vygotsky (1978), constructivism emphasizes the importance of constructive learning, asserting that knowledge construction requires active participation from learners. It describes how individuals gradually form cognitive structures through processes of assimilation and accommodation (Vygotsky, 1978). Relevant to this study, constructivism is based on the idea of student-centered learning, where students actively participate in discovery and analysis of valued knowledge. Teachers shift from being solely knowledge facilitators to help students construct their own learning through tools such as problem-based learning or cooperative group work (Motsoeneng & Moreeng, 2023). In this study's context, as digital media art design teachers collaborate with industry partners, students are guided and supported in understanding what to do and how to do it. Under constructivist theory, knowledge is viewed as dynamic, changing with context, rather than fixed (Margulies, 2024).

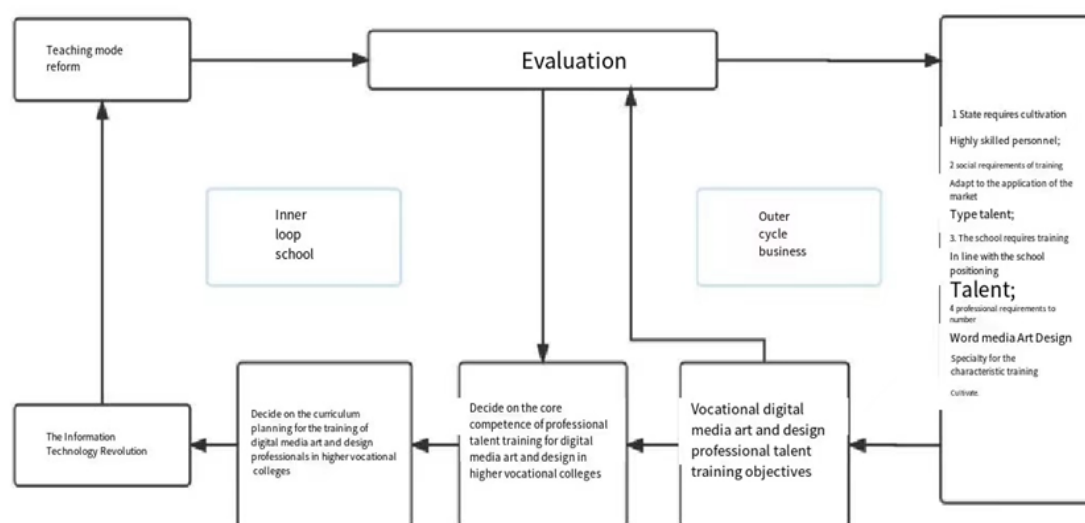
Learning experiences are designed to consider situational, collaborative, and conversational factors that engage students in active decision-making when limited standards may not serve their best interests. This study claims that three well-established constructivist strategies—scaffolding instruction, anchored instruction, and random-access instruction (Lu, 2020)—share key components that emphasize construction scenarios and cooperative learning in context, serving as tools to evaluate project accomplishment. These methods provide digital media art design teachers with a structured framework designed to deliver exceptional learning for digital media art design students. Collaborative teaching between classroom teachers and industry experts refers to the structured strategies used to organize and implement collaborative teaching activities, adapting to meet the evolving needs of learners and industry demands. Influenced by advances in technology, societal changes, and insights from cognitive science and educational psychology, collaborative teaching has shifted from traditional teacher-centered approaches to more student-centered and participatory models (Laurillard, 2012; Xi et al., 2023; Zhou, 2018).

Additionally, technology integration has considerably affected teaching collaboration process, providing opportunities for interactive and multimedia-rich learning experiences. Digital platforms facilitate collaboration and communication, while blended learning models that combine online and face-to-face instruction are becoming increasingly popular (Cho & Heron, 2019; Hamakali & Josua, 2023; Mdletye & Usadolo, 2024; Muhuro & Kang'ethe, 2025).

However, challenges related to access, equity, and digital literacy must be addressed to ensure that technology-enhanced pedagogies benefit all students (Fullan, 2013; Nwosu et al., 2023). In the context of digital media art design, collaborative teaching between teachers and industry professionals that combines technology with artistic creation, is particularly relevant in facilitating vocational students' learning needs and industry demands. Practitioners in this field continuously update their technological skills, guided by constructivist theories (Laurillard, 2012). A student-centered learning environment is essential, where students actively construct their own knowledge with teachers acting as facilitators.

Figure 1.

Theoretical framework of collaborative teaching of digital media art design



Self-planning Pedagogical Model

The field of education has experienced paradigm shifts in instructional approaches, transitioning from traditional teacher-centered methods to student-centered strategies that prioritize learner autonomy and agency (Laurillard, 2012). One such innovative approach gaining traction is the self-planning pedagogical model, which empowers students to take ownership of their learning by actively engaging in setting goals, designing learning activities, and evaluating their progress (Xi et al., 2023). The self-planning pedagogical model is rooted in constructivism and self-regulated learning theories. According to constructivist principles, learners construct knowledge through active engagement with their learning environment, while self-regulated learning theory emphasizes the role of metacognitive strategies, goal setting, and self-monitoring in fostering effective learning (Zimmerman, 2000). By integrating these frameworks, the self-planning pedagogical model aims to empower students to take control of their learning journey, promoting deeper understanding and long-term retention of knowledge.

Practically, this model can take various forms, including project-based learning, inquiry-based learning, and personalized learning plans (Laurillard, 2012). This model emphasizes students' autonomy, metacognition, and personalized learning experiences, fostering a sense

of agency and responsibility (Vygotsky, 1978). The core principles of the self-planning pedagogical model are grounded in learner autonomy, where students actively participate in decision-making processes regarding their learning objectives, strategies, and assessments. This approach is rooted in theories of self-regulated learning (Zimmerman, 2000) and constructivism (Vygotsky, 1978), which underscore the importance of learners' active engagement and reflection in the learning process. It encourages all students, regardless of their academic background, to set specific, measurable, achievable, relevant, and time-bound (SMART) goals. For example, students may collaborate with teachers to co-design learning objectives, select resources, and create assessments tailored to their interests and learning styles (Xi et al., 2023). This collaborative approach not only enhances student motivation and engagement but also cultivates critical thinking, problem-solving, and communication skills that are essential for success in the 21st century.

Research on the effectiveness of the self-planning pedagogical model has yielded promising results. Cho and Heron (2019) reported that students who engaged in self-directed goal setting and planning demonstrated higher levels of academic achievement and self-efficacy compared to those in traditional teacher-directed classrooms. Similarly, a meta-analysis by Li et al. (2020) reported positive correlations between self-regulated learning strategies and academic performance across various educational contexts. However, it is essential to note that the successful implementation of the self-planning pedagogical model requires careful scaffolding and support from educators. Teachers play an essential role in facilitating students' goal-setting processes, providing feedback, and fostering a supportive learning environment that encourages autonomy and exploration (Liu & Hardy, 2023). The self-planning pedagogical model represents a promising approach to promoting student autonomy, motivation, and deep learning. Grounded in constructivist and self-regulated learning theories, this model empowers students to take ownership of their learning processes, resulting in enhanced academic achievement and self-efficacy. While further research is needed to explore the long-term effects and optimal implementation strategies of the self-planning pedagogical model, existing evidence suggests its potential to transform educational practices and promote lifelong learning.

Comparing the three different Talent Cultivation Models from Germany, USA, Japan

The concept of a "talent cultivation model" encompasses the entire process of educating individuals based on modern educational theories and ideologies, with specific training objectives and talent specifications. This model includes stable teaching content, curriculum systems, management structures, and assessment methods. Understanding these models is essential for developing pedagogical approaches tailored to specific fields, such as digital media art design in higher vocational education. Germany, the United States, and Japan have developed distinct talent cultivation models, each providing valuable insights for the development of vocational education in China. Germany's dual system, the competency-based education (CBE) model in the United States, and Japan's industrial college pedagogical model

are relatively mature examples that have influenced international vocational education (Yang et al., 2022). Germany's dual system integrates school education with practical experience, allowing students to gain theoretical knowledge in schools and practical training in companies. This model aims to develop practical skills, professional competence, and workplace adaptability (Yang et al., 2022). Its success lies in aligning education with workforce needs, prioritizing specialized training for specific industries and professions. The German system's focus on early tracking and differentiation ensures that education is tailored to individual strengths and career aspirations. For China, adopting and adapting aspects of this model can enhance vocational education by ensuring it meets the demands of the modern workforce (Kgosi et al., 2023; Zhao et al., 2020).

Japan's Industry-Academia Collaboration Model emphasizes close cooperation with businesses, enabling students to learn about the latest technologies and market trends. This model fosters creativity and practical skills through internships and hands-on work experiences, facilitating a smoother transition into the job market (Kgosi et al., 2023; Zhao et al., 2020). However, challenges include aligning business needs with educational content and balancing practical skills with theoretical knowledge. In China, achieving this balance necessitates effective communication and collaboration between businesses and educational institutions to ensure that students acquire both practical and theoretical competencies (Arifani et al., 2020; Omodan, 2023; Zhao et al., 2020).

The competency-based education (CBE) model in the United States emphasizes personalized learning, assessing students based on their actual skills rather than the time spent in the classroom (Zhao et al., 2016). This model prepares students for real job challenges by prioritizing practical skills over theoretical knowledge. Challenges include ensuring accurate assessments of students' competencies and providing adequate support for both teachers and students. Implementing this model in China would require robust systems for validating students' skills and enhancing support structures for educators and learners (Zhao et al., 2016). Comparing these three models—Germany's dual system, Japan's Industry-Academia Collaboration Model, and the United States' CBE model—reveals common features such as practicality, vocational orientation, personalized learning, and industry collaboration (Zhang & Huang, 2018). For China to effectively cultivate market-ready talents, enhancing cooperation between schools and enterprises is crucial. Prioritizing students in the talent cultivation process requires collaborative teaching standards, content, methods, learning approaches, and evaluation systems to better align with market needs (Zhang & Huang, 2018). Drawing lessons from these international models can guide China in developing a vocational education system that equips students with the necessary skills and knowledge for the evolving job market. Based on the previous identified gap and limited studies addressed this issue. Therefore, this research aimed to address the following research questions:

1. How does collaboration between teachers and industry professionals enhance students' learning (learning content, critical thinking, and problem-solving abilities) in digital media art design?
2. How do school teachers refine their teaching strategies (instructional content, project-based learning, feedback and assessment) through collaboration with industry professionals?

METHODS

Design

This research aimed to explore how collaborative teaching between digital media art design teachers and industry refine teaching strategies and enhance students' abilities in digital media art design course. A qualitative case study design was employed to understand this unique teaching collaboration in art design course. A case study can be defined as an in-depth investigation of a specific subject (such as individual, group, institution, or phenomenon) gain a detailed understanding of real-life situations, allowing researchers to examine how and why certain issues occur within their specific contexts (Cohen et al., 2011; Creswell & Poth, 2017). The following part elaborated the uniqueness of the case study design for collaborative teaching implementation. Schools and enterprises jointly developed teaching resources, integrating the "1 + X" certificate system, national excellent courses, the national vocational education resources platform, the *Superstar* learning platform, the cloud class platform, and other resources. This collaboration connected both "online + offline" teaching resources, ensuring a comprehensive and flexible learning experience for students. The digital media art design course had a virtual simulation laboratory, photography and camera training room. The virtual simulation laboratory focuses on situational scene construction, enabling students to experience the practical application of digital technology, animation, gaming, and other related fields.

Figure 2.

Digital media art laboratory



Digital media art design laboratory included training in universe design, motion capture, and design processing. The establishment of off-campus training bases by enterprises aimed to effectively leverage enterprise resources. These training bases were particularly tailored to meet the needs of the majors, providing students with dedicated training space and equipment. Courses offered at the off-campus bases cover technologies such as augmented reality (AR), virtual reality (VR), motion capture, and artificial intelligence (AI), considerably enhancing students' learning experiences. In the teaching process, emphasis was on project-based teaching. This approach involved designing a series of practical projects that integrate key knowledge points and skills, allowing students to learn and master them through hands-on practice.

Participants

The participants were the second-year undergraduate students with majors in digital media art design from G College, a comprehensive higher vocational college with an engineering department in the 2022 academic year. This class was selected for the research as it had been undergoing talent development using the "self-planning" model for one year. Hence, the class was deemed suitable for investigating the effectiveness of the talent development model. A total of 29 students registered for the module, and six student participants from this cohort were purposively selected based on the criteria of full class attendance and performance, as the class had used the self-planning talent training model. Additionally, two lecturers and two participants from two digital media art design were purposively selected.

All the participants accepted the voluntary invitations to participate in the study. This technique enabled the researchers to select a suitable and manageable sample. Participation in the study was by consent and entirely voluntary (Cohen et al., 2011; Creswell & Poth, 2017, Kgosi et al., 2023). Specifically, the demographic information of the research participants was elaborated below.

Student participants: Student participants included Mr. W, age 20, specializing in digital media art design; Miss C, age 18, specializing in digital media art design; Miss H, age 19, specializing in digital media art design; Miss W, age 19, specializing in digital media art design; Mr. L, age 20, specializing in digital media art design; and Mr. F, age 19, specializing in digital media art design.

Instruments

To address the first research question, the instrument included a semi-structured interview protocol and an observation form to explore how collaboration between teachers and industry professionals enhances students' learning content, critical thinking, and problem-solving skills in digital media art design. The interview protocol contained open-ended questions designed for teachers, industry professionals (experts), and students. The focus of the interview questions for teachers and industry professionals was how collaborative teaching strategies could refine students' learning content, critical thinking, and problem-solving abilities. Meanwhile, the focuses of interviews for the students included how these collaborations influenced their ability to think critically, solved design-related problems, and applied industry practices to their

creative work. Additionally, an observation form was also developed to systematically capture how students engaged with learning content, applied critical thinking, and developed problem-solving skills in classroom and industry-partnered sessions.

Then, to address the second research question, the research instruments involved semi-structured interview protocols, observation form, and document analysis to examine how school teachers refined their teaching strategies through collaboration with industry professionals. The interview protocol contained open-ended questions designed to explore teachers' experiences in adapting instructional content, integrating real-industry project-based learning, and modifying feedback and assessment strategies based on industry collaboration. Separate interview questions were also formulated for industry professionals to understand their role in shaping teaching practices, as well as for students to gain insight into how these refinements impacted their learning experiences. An observation form was also applied to systematically document teacher-industry interactions, instructional modifications, and the implementation of industry-driven projects in the classroom. By triangulating data from interviews, observations, and document analysis, this study could provide a comprehensive understanding.

Data collection procedures

The study aimed to draw how collaborative teaching between classroom teachers and industry professional enhanced students' learning and refined teachers' instructional strategies of digital media art design in a Chinese higher education context. Semi-structured individual interviews, document analysis, and observation (Arifani et al., 2020; Cohen et al., 2011) were used to collect data. Interviews with the teachers, industry experts and students were conducted twice for each participant. The first interview session aimed to explore how collaboration between teachers and industry professionals enhanced students' learning, critical thinking, and problem-solving skills in digital media art design. Then, the second interview session were conducted after classroom observation to verify and validate participants' responses regarding their responses in the first interview session.

Meanwhile, classroom observations were also conducted in two phases. The first phase focused on collaborative instructional activities which might enhance students' participation in industry-driven projects, and the application of feedback from professionals. The second phase of observation relied on industry-partnered sessions to document how teachers integrated industry insights into their teaching practices such as instructional modifications, project-based learning implementation, and assessment strategies informed by industry feedback. The processes of data collection were conducted after obtaining approval letter from the school principal and research committee. All participants who participated in this research were under the voluntarily basis and they could withdraw their participation if they required.

Data analysis

The present study employed Creswell and Poth's (2017) phases of thematic analysis provided the framework for guiding the analysis. According to Creswell and Poth (2017), qualitative data

analysis includes gathering and categorizing qualitative information, including interview transcriptions or audio recordings and documents. This study employed thematic analysis to analyze the data, as it was essential to go beyond words and phrases to capture both implicit and explicit ideas within the data.

Therefore, to analyze the data collected for this study, we began by thoroughly reading all the interview transcriptions, making notes where necessary. From this data, we selected the richer and more relevant interview excerpts, noting assumptions across variations along a marginal line. The information was then organized into categories based on similar subject matter concepts, and patterns were identified. All topics were identified, coded, and labeled descriptively based on the recurring themes related to how teachers adapt, refine their teaching strategies, collaboration dynamics, and learning development in digital media art design through industry collaboration. Data sources triangulation from interview, observation and document were applied to enhance reliability and provide a comprehensive understanding of the impact of teacher-industry collaboration on pedagogical refinement.

FINDINGS

Research Question (RQ1): How does collaboration between teachers and industry professionals enhance students' learning in digital media art design?

The results of the first research question were derived from classroom observation and in-depth interviews with the study participants. The results of classroom observation indicated that collaboration between digital media art design teachers and industry experts could enhance students' learning (digital media art design) by providing real-world insights and hands-on learning experiences because industry experts provided current art and design trends with more advanced technology tools into the classroom, making digital media art design learning more practical and relevant for the students.

Students attained relevant exposure to real-life industry situations, allowing them to enhance problem-solving skills, adaptability, and a deeper understanding of how their creative and technical skills could be applied in the real industry contexts (*Example of observation 1: fashion branding design project-based learning. In this activity, the industry experts gave the students challenges to rebranding and repackaging various models of fashions and showcased their work and received professional critique from industry experts*). This experience enhanced students' problem-solving abilities by requiring them to address industry-specific challenges. Additionally, the activity strengthened their professional communication skills through client interactions and team collaboration. This approach also promoted a more dynamic classroom learning environment, where theoretical knowledge was effortlessly incorporated with industry practices.

Another observation result could be illustrated in the learning activities where industry experts assigned the students to create community-based art design. In this activity, the students collaborated with local businesses and cultural organizations to create branding

materials, digital experiences, murals, or event designs that serve a community need. The project began with students meeting with potential stakeholders to identify their challenges and business objectives. They then conducted mini research, guided by both their instructors and industry professionals. Over the following weeks, students developed creative solutions, refined their work based on feedback, and, in some cases, implemented their designs in real-world settings (Example of observation 2). This project not only allowed students to apply their creative and technical skills in a meaningful way but also to teach them adaptability as they navigated client expectations and industry standards. Furthermore, it provided insight into how digital media art design could contribute to social and economic impact, preparing students for their future careers.

Additionally, collaborative learning projects provided opportunities for the students to work on real-industry assignments, fostering confidence and preparing students for future careers. Reciprocal partnerships with industry expert helped students develop their professional networks and increase career readiness. Teachers also benefitted from these collaborations by staying updated on industry trends and issues, which enabled them to refine their teaching approaches to align with the development of industry demands.

Then, the results of interviews for addressing this first research question were derived from the curriculum or classroom teachers, industry experts and students who attended the course of digital media art design. The interview results with teachers revealed that collaboration with industry played a crucial role in promoting students' learning (digital media art design) experiences. Teachers noted that industry experts bring real-industry experiences that helped students learn and understand the new trends and demands in digital media art design fields. One teacher mentioned:

"When industry experts come into the classroom, students see how their skills apply in real jobs. It makes learning more meaningful and exciting for them. You can observe when the students presented their project 'rebranding and packaging models'. The students can work collaboratively on address real-industry problem solving. Classroom teaching and learning become more real and meaningful" (Sample of interview with curriculum Teacher).

Through collaboration with industry experts, teaching content and projects were more reflective of real-industry scenarios, helping students develop their practical skills aligned with market demands. Industry experts (teachers from industry) emphasized the importance of this collaboration in providing students with exposure to authentic industry challenges and projects, thereby improving their practical abilities to meet market requirements. The following excerpt indicated the quotes from the industry experts and students.

"Industry experts have a strong connection with the market. During the teaching process, we can inform students about future market developments, what the market needs are, and how the market may change in the future. In addition to offering guidance on employment and entrepreneurship, corporate mentors incorporate practical assignments

into the teaching process, which helps students improve their professional skills" (Interview sample 1 with industry experts)

"We have benefited immensely from the mentorship programs given by the industry experts. We also receive direct feedback from them, which helps us refine our work and understand industry expectations and standards" (Interview sample 1 with students).

Collaboration between teachers and industry experts in the field of digital media art design could significantly improve students' learning content, critical thinking, and problem-solving skills. Teachers provided a structured theoretical foundation and pedagogy, while industry experts brought practical insights, the latest technology, and real-industry challenges that encouraged students to think more analytically and innovatively. With this approach, students not only understood the concepts of design and digital media in more depth, but also learned to apply learning content strategically to create projects that are relevant to the demands of industry and future professional careers.

Research Question (RQ2): How do school teachers refine their teaching strategies through collaboration with industry professionals?

The findings for the second research question were derived mainly from in-depth interviews with the teachers. The findings were also derived from observation results and document analysis. The analysis results indicated three areas of teaching strategies refinement, namely: refinement of instructional content, project-based learning activities, and feedback and assessment.

The results of interviews with the teachers indicated that collaboration with industry professional/experts in digital art media course could refine teachers' teaching content knowledge (instructional content) through the incorporation of latest software, techniques, and workflows from industry into instructional practices, helping teachers update their lessons accordingly such as the integration of UX/UI design principles, motion graphics techniques, or AI-driven art tools, into classroom instruction. This strategy ensured that students were not only learning theoretical concepts but also gaining practical experience with cutting-edge technologies and creative workflows that could prepare them for future careers. This approach ensured that students learned not only the fundamentals of digital media but also the current best practices used in professional settings. The following quotes indicate their instructional refinement:

"When we design projects together, we usually use our traditional art design and branding. Consequently, it is little bit slow and the design results are far from industry expectations. Using software, techniques and workflows from industry gave us (teachers) and our students a deeper understanding of what clients expect and how to problem-solve effectively. In this case, we update our instructional content using technological tools from industry" (sample interview 1 with the teachers).

"Working with industry professionals has completely transformed how we approach teaching digital media and design. They bring insights into the latest tools and trends,

which helps me keep my curriculum relevant. Now, my students are learning skills that they actually use in the workforce" (sample interview 2 with the teachers).

Additionally, beyond content refinement, teachers mentioned that collaboration with industry expert could enhance their project-based learning that reflected authentic industry challenges. The projects, such as branding exercises, design prototypes, motion graphics storytelling, and interactive media designs usually implemented based on the curriculum (which did not address industry demands), but after collaborative teaching with industry, their classroom teaching activities became the mirror of what professionals and industry did. This practical exposure helped our students build strong portfolios while improving their problem-solving, critical thinking, and adaptability skills. Additionally, industry experts could mentor our students throughout the learning process, providing valuable guidance and feedback. The following quotes represent teachers' idea.

"When we design learning projects for our students, we focus on real-world challenges. For example, our students recently created branding packages for local businesses. Having industry professionals involved gave them a deeper understanding of what clients expect and how to problem-solve effectively" (sample interview 3 with the teachers)

"In our graphic design course, we usually assign our students to design a logo and marketing materials beyond real-industry demands. However, after we collaborate with a branding expert from industry, we refine our project into more real-world contexts and ask our students to design a logo and marketing materials for a real-world client" (sample of document analysis and observation 1).

Another key refinement of teachers' instructional practice through collaboration with industry was the enhancement of feedback and assessment methods. Industry professionals offered valuable critiques on student work, providing perspectives beyond academic grading. This assessment strategy allowed students to understand how their work could be accepted in professional environments and refined their designs accordingly. Moreover, teachers and industry partners could develop more relevant rubrics that assessed not just technical proficiency but also creativity, innovation, and real-world applicability, ensuring that students' assessments aligned with industry expectations. Below is the quote from the teachers.

"We usually provide academic grade for our students based on paper-pencil test and online test to determine their performance and technical skills. After collaborating with Industry experts, we change our assessment approaches into students' ability to think creatively, adapt, team work, and problem solving. Our feedback has oriented to refine our students' portfolios and prepare them for real-world job applications" (sample of document analysis and observation 2).

"Collaborating with industry experts is not just about improving teachers' instructional practices—it is also about professional growth for teachers. Learning about new tools and design trends keeps us excited and motivated to bring fresh ideas into our instructional practices" (sample of interview 4 with the teacher).

Collaboration between teachers and industry experts in the field of digital media art design could significantly enhance not only teachers' instructional practice but also their professional development. Industry experts provided guidelines for teachers to refine their instructional content of digital media art design, project-based learning activities from less real-industry into real-industry projects, feedback and assessment from technical skills into performance-based and portfolio, and teacher professional growth.

DISCUSSION

The discussion of this study is divided into two parts. The first parts deal with the findings of the first research questions and the second part deals with the findings of the second research questions.

The findings of the first research question revealed that collaborative teaching with industry experts enhanced students' learning content, critical thinking and problem solving (digital media art design) through enriching learning content using real-industry learning activities and authentic project-based challenges. The finding revealed that collaborative teaching (between digital media art design teacher and industry experts) enhanced students' learning content of art design and digital media. The process of improving students' learning content in digital media art design occurs through several possibilities. First, students gain deeper insight into industry practices, as experts share real-world experiences and professional standards applied in the workplace. They also introduce the latest techniques and software used in the industry, so students can learn more efficient and relevant methods than relying solely on academic theory.

Next, students experience skill enhancement through industry-based projects given by industry experts. They can work on real challenges, such as creating designs for clients or developing digital media with certain specifications. By getting direct feedback from professionals, students learn how to improve their work according to industry standards. In addition, exposure to the latest trends and innovations makes them more creative, critical, and ready to face challenges in the world of work.

Previous research applying experimental designs by Biesta (2012) and Tucker (2012) showed that collaboration between art teachers and industry experts in teaching digital media art design has a significant positive impact on improving students' learning content. Then, other research by Paek (2020) using quantitative design also indicated improvement in students' learning content of art design. However, the improvement students' learning content in previous studies was mostly analyzed from the changes of pre-test and post-test. Consequently, the dynamic aspects of students' content improvement before and after collaborative teaching cannot be generated. Consequently, through this qualitative analysis, the dynamic aspects of students' learning improvement before and after collaborative teaching (teachers and industry

professionals) can be comprehensively explained in the above findings as the novelty of this present study.

Another finding by Huang et al. (2024) also indicated that collaboration between classroom teachers and industry experts facilitates students' critical thinking skills and problem-solving abilities. The process of improving students' critical thinking and problem-solving abilities is likely to occur because students are faced with real-world challenges that require in-depth analysis, exploration of various solutions, and evaluation of their design decisions. When students work on real-industry projects to train them in analyzing target audiences, evaluating current design trends, and adjusting their work based on client feedback. This process teaches students how to overcome obstacles in real design projects, think critically about the aesthetics and functionality of their work, and develop innovative solutions that can be applied in the creative industry (Fullan, 2013). Through this approach, their critical thinking and problem-solving skills develop significantly, preparing them for future professional challenges. The findings are not much different from previous research findings showing that the application of real industry projects in art design and media technology learning can significantly improve students' critical thinking and problem-solving skills. For example, a study found that the use of Canva media in project-based learning was effective in improving students' creativity, which is an important component in critical thinking (Vembye et al., 2024; Walter, 2024).

Furthermore, the findings of the second research questions indicated that collaborative teaching with industry experts refined teachers' teaching strategies regarding their instructional content, project-based learning activities, and feedback and assessment. Collaboration between art teachers and industry experts can improve teachers' teaching content by ensuring that the material taught is always relevant to the latest industry trends and standards. Industry experts provide insights into the latest design techniques, professional software used in the workplace, and emerging market needs. With this collaboration, teachers can update their curriculum to be more practical and applicable, integrate real-world case studies, and adopt project-based learning methods that are more challenging for students. This approach not only improves the quality of learning but also prepares students with skills that are in line with the needs of the creative industry in the future (Lyle & Peurach, 2024; Yang et al., 2022).

For example, in previous teaching activities, classroom teachers usually teach the basics of graphic design using software such as Adobe Photoshop and Illustrator, but after collaborating with industry experts, they began to integrate more specific and needed skills in the workplace, such as 3D asset creation using Blender, user interface (UI/UX) design for applications, and interactive animation techniques. In addition, teachers also receive direct training from industry professionals on the work pipeline in game development and how to teach students how to think critically in the design process. Thus, the teaching content becomes more up-to-date, applicable, and effective.

Previous research has shown that collaboration between art teachers and industry experts can improve teaching content in art design and digital media. For example, Lyle and

Peurach, (2024) emphasized the importance of collaboration between industry and universities in the field of visual communication arts, which can increase the relevance of the curriculum to the needs of the information technology industry. In addition, (Cho & Heron, 2019) explored strategies to improve the effectiveness of digital media art design teaching, including the integration of industry practice and theory, as well as collaboration between academia and industry, all of which contribute to improving the quality of teaching. Furthermore, Cho and Heron (2019) found that collaboration between art and technology can improve students' digital skills, create more engaging art learning, and motivate teachers to be more adaptive to technology.

Furthermore, the findings of this study also indicated changes of teachers' strategies in providing feedback and assessments, which were initially based on paper-pencil tests and technical knowledge to portfolio-based and performance-based assessments. Collaboration with industry experts encourages teachers to change assessment methods from being theory-based to being more applicable and contextual. Before collaborating with industry, teachers commonly assessed students learning improvement based on the results of their artwork or digital projects without considering the creative process and industry standards. However, after collaborating with professionals, teachers begin to adopt a project-based approach that is more similar to evaluations in the workplace. The emphasis of teachers' assessments strategy cover students' critical thinking, problem solving, and abilities to design and adapt designs according to client or target market needs. Thus, the coverages of assessment focus not only on the aesthetics of the work but also on its relevance and functionality in the creative industry (Boud & Bearman, 2024; Smith et al., 2025).

Additionally, teacher assessments are becoming more feedback-based and iterative, as they are under the supervision of industry professionals. Students not only receive a final grade, but also receive constructive criticism from teachers and industry experts to improve their work. For example, in a UI/UX design project, students are asked to conduct user research, create an initial prototype, and then make revisions based on feedback from industry professionals. This approach mimics real-world work practices in the creative industry, where projects undergo multiple refinements before the final product is released. With more dynamic, process-based assessments, students learn not only how to create quality work, but also develop reflective thinking and adaptive skills that are essential for success in the industry.

Previous studies have not discussed much about changes in the way teachers provide feedback and assessment after conducting collaborative teaching with industry experts in art design and digital media (Smith et al., 2025). Consequently, the findings of this study provide a scientific contribution to assessment field that emphasizes the importance of conducting performance-based and portfolio assessments by prioritizing the implementation of real-industry project-based learning to promote students' critical thinking skills and problem-solving abilities (Zhou, 2018). In addition, this collaboration encourages teachers to adopt more applicable and contextual assessment methods. Through collaborative projects that integrate

various fields of study, students can engage in an active creative process, explore their ideas, and build a deep understanding of art concepts. This approach allows teachers to assess students' critical thinking and problem-solving skills in a real-world context, making assessments more relevant to industry needs (Boud & Bearman, 2024; Xi et al., 2023).

Conclusion

The study aimed to provide insights for enhancing digital media art design courses in higher vocational education across China by analyzing G College's collaboration initiatives. The study findings reveal that the self-planning pedagogical model helps students in identifying their professional positioning while supporting a student-centered approach. Moreover, it promotes partnerships between schools and industries. The study concludes that students should be the primary focus of digital media and design courses, and teachers should adopt the self-planning pedagogical model to improve academic quality and multidimensional thinking in the teaching and learning process.

The study limitations primarily revolve around constraints related to time and the need for further exploration of education policies. Due to time constraints, the study only conducted one cycle of implementation at G Vocational and Technical College, which limits the generalizability of the study findings. Future research should aim to broaden its scope by including diverse samples, expanding the geographical range, or incorporating multiple colleges to comprehensively assess the results. Additionally, while the study touched on integrating corporate resources into the educational system, it did not sufficiently explore relevant education policies. Future studies should delve deeper into how policy support can facilitate the integration of corporate resources with the educational system.

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