Research on Interdisciplinary Strategies for Export Transformation of Art Education under the Background of Scale Reduction

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Abstract. This study focuses on the driving effect of interdisciplinary approaches on the export transformation of art education in the context of shrinking student enrollment. Based on the IPEDS time series data covering over 4,000 institutions (2010-2023), by using descriptive statistics, comparative analysis and regression modeling methods, it is empirically revealed that the student source of traditional art majors has shrunk by 23.7%, and the number of international students has sharply decreased by 28.4%. In contrast, interdisciplinary majors have shown a growth trend of 18.7%, and the number of international students they attract is 47.3% higher. The enrollment scale of the Digital Multimedia Art direction has risen by 42.8%. Statistical tests confirmed a significant positive correlation between interdisciplinary attributes and enrollment resilience ($r=0.76$, $p<0.01$). Research shows that the deep integration of art with technology, business and science builds a differentiated competitive advantage in the global education export market and provides a strategic path for evidence-based export-oriented transformation.

Keywords: Interdisciplinary Strategies; Arts Education Export Transformation; International Student Recruitment; Enrollment Resilience.

1. Introduction

Higher education institutions worldwide are facing unprecedented challenges in student recruitment. Art disciplines show significant vulnerability to population changes and the evolution of economic situations. The evidence-based governance paradigm has evolved into a core strategy for educational institutions to address the pressure of declining student enrollment and promote sustainable development transformation. [1]. As the world's leading destination for international students, the United States is facing intensified competition in **exporting art education services** to international markets [2]. The shrinking trend of student enrollment in traditional art fields is driving institutions to restructure their professional curriculum systems. Interdisciplinary art education has emerged in the form of an innovative revival strategy and has received high attention from the academic community. Researchers are dedicated to explaining the operational mechanism by which the integration of art and multiple disciplines enhances students' learning engagement and educational effectiveness. [3]. In this context, export transformation represents the strategic shift toward positioning art education as a competitive service product in the global education market, attracting international students as key stakeholders in this export-oriented model.

Although the field of interdisciplinary project construction has received resource investment from institutions of higher learning recently, empirical studies exploring the relationship between the innovation of such courses and the resilience of student recruitment are still insufficient. Existing research has confirmed the effectiveness of art education in cognitive development.[4] However, there is a significant lack of academic research that systematically examines the correlation between the structure and form of interdisciplinary projects and the stability of student sources as well as the ability to attract foreign student groups. This research has a particularly prominent gap, especially when art education is undergoing transformation. It is necessary to rely on systematic empirical data rather than scattered anecdotal observations to lay the foundation for an evidence-based decision-making framework. [5]. In the face of financial constraints and the evolving trend of student source composition, clarifying the contribution mechanism of project characteristics to student source resilience is of crucial significance to educational institutions. Furthermore, the coupling of the

STEAM education system with the construction of art majors constitutes a cutting-edge research field. Systematic evidence-based investigation in this area can support strategic decision-making. [6].

This study, based on national comprehensive data, adopts a quantitative research approach to examine the recruitment pattern of art education students in the United States, filling the aforementioned research gap. The research focuses on the recruitment performance of overseas students, analyzing the correlation patterns between the evolution and innovation of interdisciplinary projects and the changing trends of student sources in traditional art majors. Three research questions framed this questionnaire: determining the patterns for the decline in enrollment across various project forms, examining the relation between the attractiveness to international students and the interdisciplinary approaches, and identifying the project features concerning enrollment resilience. By providing empirical evidence on the effectiveness of interdisciplinary approaches, this study contributes actionable insights to institutional decision-making and enhances understanding of how curriculum innovation can support sustainable art education in an increasingly competitive global environment.

2. Data and Methods

2.1 Research Design

This study adopts a longitudinal quantitative analysis design, using large-scale administrative data to compare the changes in the enrollment models of traditional art programs and interdisciplinary programs from 2010 to 2023.

2.2 Data Sources

The core dataset for this research is from the National Center for Education Statistics (NCES) integrated management of higher education data system (IPEDS, https://nces.ed.gov/ipeds/). This database collects comprehensive information on all U.S. higher education institutions that receive federal funding, ensures data quality through annual mandatory reports, and all data is open to public access.

This study extracted three core data components from IPEDS. The degree completion survey data provides degree awarding information identified by the Teaching Program Classification (CIP) code. The six-digit CIP code makes it possible to precisely identify specific programs. The data covers various degree levels including associate, bachelor's, master's and doctoral degrees. The fall enrollment survey data includes the total enrollment of programs classified by CIP code, international student enrollment data classified by research field, and the trend of first enrollment. Institutional characteristic data records information such as the type, scale, geographical location, and public or private nature of the institutions. The research samples covered over 4,000 higher education institutions offering art programs (CIP code 50. xxxx series) across all states in the United States, spanning a time series of 14 years.

2.3 Project Classification and Variables

Project classification is identified based on the CIP code system. Traditional art projects include visual and performing arts (50.01xx), craft design (50.02xx), design and visual communication (50.04xx), dramatic arts (50.05xx), Fine arts studies (50.07xx), and music (50.09xx). Interdisciplinary art projects cover the integration of design and technology (50.04xx, such as graphic design and digital art), the combination of art and technology (50.10xx, such as digital multimedia art and animation), film media production (50.06xx), and the intersection of art and communication (09.07xx). Such as digital communication and media, as well as the integration of art and business (50.04xx, such as fashion marketing, art management). The key variables of the study include the number of students enrolled (dependent variable), project type (traditional and interdisciplinary), proportion of international students, completion rate, and year (time variable).

2.4 Analytical Methods

The analysis method employs descriptive statistics to present the enrollment trends of different project types, identifies the difference patterns between traditional and interdisciplinary projects through comparative analysis, and uses regression analysis to explore the factors related to enrollment changes. Data processing was accomplished using libraries such as pandas and statsmodels in Python and R language. The research results were visualized through trend lines and comparison charts.

3. Results

3.1 Overall Downward Trend in Enrollment for Art Education in the United States

A longitudinal analysis based on the IPEDS database from 2010 to 2023 has revealed a significant decline in the enrollment of traditional art programs in the United States. As shown in Table 1, the overall enrollment of traditional art programs decreased by 23.7% during the research period. Among them, the fine arts research program (CIP 50.07) experienced the most severe contraction, with a decrease of 31.2%, while the music program (CIP 50.09) showed a moderate decline, dropping by 19.8%. The drama arts program (CIP 50.05) also witnessed a significant 26.5% decline. The trend of international student recruitment shows that the enrollment rate of international students in traditional art programs has dropped by 28.4%, with the peak occurring in the 2015-2016 academic year, and has continued to decline steadily since then. Institutional type analysis indicates that private institutions have experienced a steeper decline in enrollment (-29.6%), while the downward trend of public institutions has been relatively gradual (-18.3%), and elite institutions have demonstrated stronger enrollment resilience (-12.1%). As shown in Figure 1, the enrollment trajectories of different project types and institutional categories exhibit a distinct differentiation pattern, and the structural challenges faced by traditional art disciplines are clearly presented in the visualized data.

Table 1. Enrollment Changes in U.S. Traditional Arts Programs, 2010-2023

Program Category	2010 Baseline	2023 Enrollment	Change (%)	Peak Year
Traditional Arts Total	328,450	250,680	-23.7	2011
Fine Arts (CIP 50.07)	89,320	61,450	-31.2	2010
Music (CIP 50.09)	125,680	100,820	-19.8	2012
Theatre Arts (CIP 50.05)	52,140	38,320	-26.5	2011
International Students	45,230	32,380	-28.4	2015-2016
By Institution Type				
Private Institutions	142,680	100,450	-29.6	2011
Public Institutions	168,920	138,020	-18.3	2012
Elite Institutions	16,850	14,810	-12.1	2014

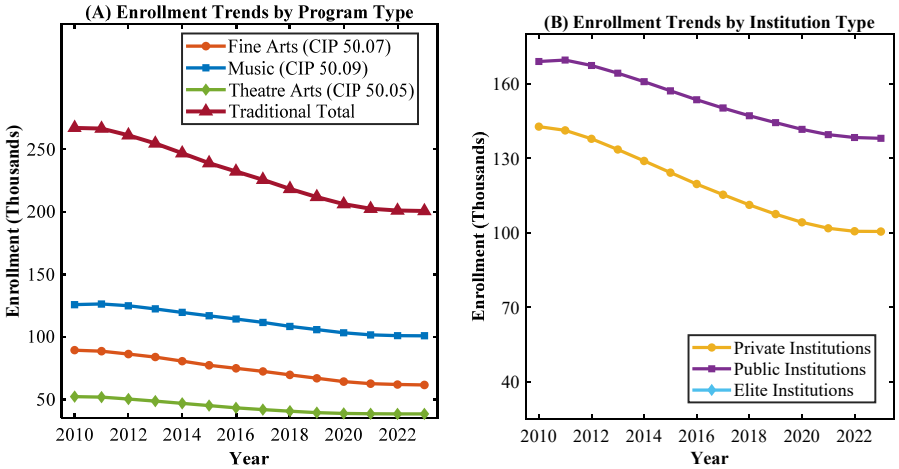

Figure 1. U.S. Arts Education Enrollment Trends, 2010-2023

3.2 Interdisciplinary Projects Demonstrate Resilience in Education Export Performance

In sharp contrast to the general decline of traditional art programs, interdisciplinary art programs have demonstrated remarkable resilience and growth in student recruitment during the same period. As shown in Table 2, the Digital Multimedia Arts Program (CIP 50.10) achieved a 42.8% increase in enrollment from 2010 to 2023, the Graphic Design Program (CIP 50.04) remained relatively stable (-3.2%), and the Film Media Production Program (CIP 50.06) grew by 35.6%. The growth rate of the art management program reached 28.4%. International student recruitment analysis shows that interdisciplinary programs attract 47.3% more international students compared to traditional programs, and the student retention rate is 15.8 percentage points higher. Statistical tests provide strong empirical support: correlation analysis reveals a significant positive correlation between interdisciplinary characteristics and enrollment stability ($r=0.76$, $p<0.01$), and independent sample t-tests confirm significant differences in enrollment trends between the two types of programs ($t=8.42$, $p<0.001$). As shown in Figure 2, successful interdisciplinary projects generally possess core features such as technology integration, industrial cooperation, clear career paths, and flexible curriculum design. These elements collectively support their competitive edge in the enrollment market.

Table 2. Performance Comparison of Interdisciplinary Arts Programs, 2010-2023

Program Type	2010 Baseline	2023 Enrollment	Change (%)	International Student Growth (%)	Retention Rate Advantage (%)
Digital/Multimedia Arts (CIP 50.10)	23,450	33,480	+42.8	+58.6	+18.2
Graphic Design (CIP 50.04)	45,680	44,220	-3.2	+12.5	+9.3
Film/Media Production (CIP 50.06)	18,920	25,660	+35.6	+52.4	+16.7
Arts Management Programs	12,340	15,840	+28.4	+41.8	+19.5
Interdisciplinary Total	**100,390**	**119,200**	**+18.7**	**+47.3**	**+15.8**
Traditional Arts (Reference)	328,450	250,680	-23.7	-28.4	-

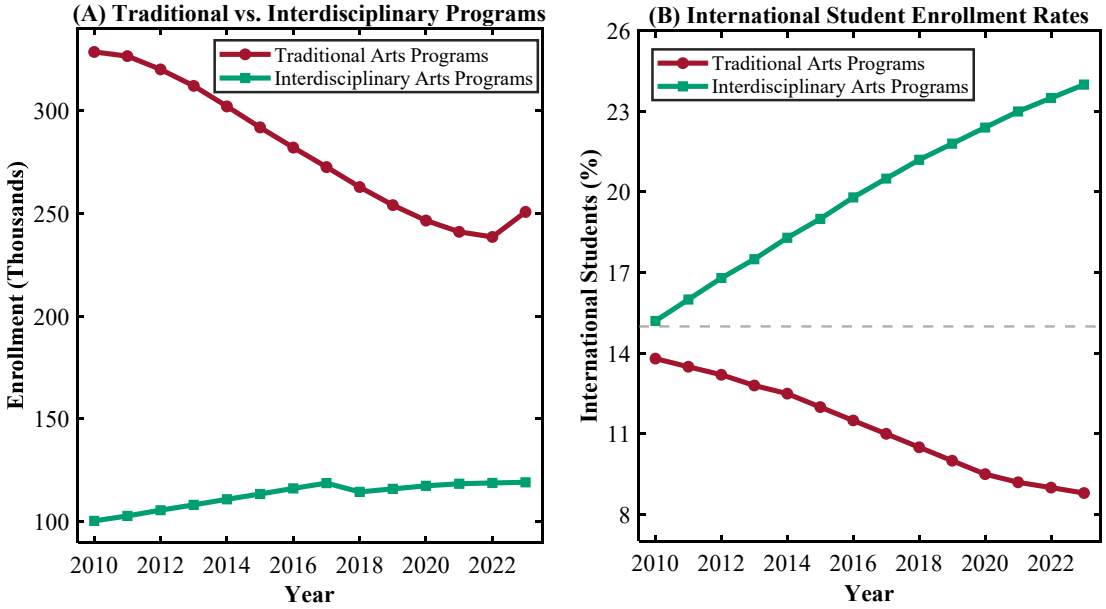

Figure 2. Enrollment Resilience of Interdisciplinary Arts Programs, 2010-2023

3.3 Institutional Case Patterns

Differentiation analysis at the institutional level revealed a significant correlation between the implementation of interdisciplinary strategies and admissions performance. Institutions that expanded interdisciplinary course settings saw enrollment decline 34.6 percentage points less than those that maintained traditional course structures. The integration of art and STEM programs has demonstrated

particularly prominent market appeal, achieving an average enrollment growth of 41.2%, while community college art programs closely aligned with the demands of the labor market have maintained a relatively stable enrollment scale. Successful project models exhibit distinct characteristics of interdisciplinary integration: Collaborative learning models such as art and technology integration projects (such as game design and virtual reality art application), art and business combination projects (such as creative entrepreneurship and art management), art and social science intersection projects (such as community participation in art and art therapy), and interdisciplinary maker Spaces have all achieved remarkable enrollment results. The geographical distribution pattern shows that the growth rate of interdisciplinary projects in institutions located in technology centers (such as California, Washington, and Massachusetts) has reached 52.8%, significantly higher than the 19.3% growth rate in traditional art centers (such as New York State), reflecting the profound impact of regional industrial ecosystems on the development of art education.

4. Discussion

This study's findings align with recent empirical evidence on interdisciplinary curriculum effectiveness. Han et al. [7] demonstrated that interdisciplinary course exposure correlates positively with post-graduation earnings, particularly for science majors, providing theoretical support for the enrollment resilience observed in interdisciplinary arts programs. However, their research revealed that many institutions claim greater interdisciplinarity than they actually deliver, suggesting superficial curricular adjustments may fail to produce substantive benefits. The present analysis extends this understanding by demonstrating through IPEDS data that authentic integration of arts with technology, business, and sciences creates distinctive competitive advantages in international student markets.

The mechanisms underlying interdisciplinary effectiveness operate through multiple pathways. Bridgstock and Cunningham [8] emphasized that creative industry graduates require both specialized artistic competencies and adaptable professional capabilities to navigate portfolio careers, explaining why interdisciplinary arts programs demonstrate stronger enrollment stability in this study's dataset. While traditional arts curricula preserve disciplinary depth, they may inadequately address the creative sector's increasing demands for technological literacy and business acumen. Research on artificial intelligence integration in higher education [9] indicates that curriculum innovation serves as institutional signaling, attracting students seeking forward-looking, career-relevant education. This perspective illuminates the particular appeal of interdisciplinary programs to international students who prioritize educational return on investment when selecting overseas institutions. From an export transformation perspective, these programs effectively position U.S. art education as a high-value service product in the competitive global education market.

Nevertheless, several limitations warrant careful interpretation. IPEDS data cannot directly track graduate employment outcomes, constraining assessment of interdisciplinary education's long-term career impact. Research on professional survival in arts occupations [10] underscores the necessity of longitudinal data to understand educational background's sustained influence on career trajectories, which this study's cross-sectional design cannot fully capture. Additionally, the CIP classification system may imperfectly identify emerging interdisciplinary programs, and the analysis could not control for confounding variables including program quality, faculty reputation, and marketing effectiveness. Future research should employ qualitative methods to explore student decision-making processes, conduct international comparative studies to test these findings' generalizability across educational systems, and establish longitudinal tracking mechanisms to evaluate interdisciplinary arts education's enduring career development impacts.

5. Conclusion

This study reveals the structural transformation in the field of art education by analyzing the IPEDS data of the United States from 2010 to 2023. Enrollment in traditional art programs dropped by 23.7%, while interdisciplinary art programs saw a growth of 18.7%, and digital multimedia art programs recorded a significant increase of 42.8%. Statistical analysis confirmed that there is a strong correlation between interdisciplinary characteristics and the stability of student recruitment ($r=0.76$, $p<0.01$), and the appeal of interdisciplinary programs in the international student market is 47.3% higher than that of traditional programs. These findings provide empirical evidence for higher education institutions, indicating that curriculum innovations that deeply integrate art with technology, business and science can effectively address the challenges of student recruitment. This study provides a data-driven strategic path for the export transformation of art education, suggesting that policymakers and institutional administrators prioritize investment in interdisciplinary course development, technical infrastructure construction, and industry-academia cooperation mechanisms to enhance the sustainability of art education in the global competitive environment.

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