Adult and Higher Education (2024)
Clausius Scientific Press, Canada

DOI: 10.23977/aduhe.2024.060806
ISSN 2523-5826 Vol. 6 Num. 8

Path of Cultivating International Talents in Universities under the Background of Digital Transformation of Education

Zhiguo Feng, Yongping Xiao, Xiaoyu Ma

School of Humanities and Foreign Languages, Qingdao University of Technology, Qingdao, China

Keywords: Digital Transformation of Education, Internationalization of Universities, Talent Training Paths, Cross-Cultural Communication Capabilities

Abstract: Against the backdrop of rapid global integration, strengthening international exchanges and cooperation has become an important way for colleges and universities to improve their competitiveness and students' career development capabilities. Cultivating international talents and ensuring the quality of education and employment competitiveness are still issues to be solved in the field of education. This paper explores the impact of digital transformation of education on the cultivation of international talents in colleges and universities, and analyzes its role in improving academic performance, the number of talents cultivated, and the employment rate of graduates. This study uses a mixed research method, using a before-and-after comparison method to analyze the data before and after a university's digital transformation. The research is supplemented by collecting feedback from teachers, students, administrators, and education experts to ensure that the data obtained are both comprehensive and representative. The study mainly focuses on changes in academic performance, the number of international talents trained, and employment rates. Data collection covers changes in academic performance, cross-cultural capabilities, employment status, etc. Quantitative data are analyzed using SPSS, and qualitative data are processed through content analysis. The results show that digital transformation has significantly improved students' academic performance, with an average increase of 9.6 points, and most classes have seen an increase of between 7 and 10 points. After the transformation, class size generally increased by 23% to 36.8%. This change shows the role of digital transformation in increasing student numbers and improving educational outcomes. The employment rate of graduates has also been significantly improved, with the growth rate of employment in all classes ranging from 30% to 58.3%. Overall, the digital transformation of education has effectively promoted the improvement of the quality and quantity of talent training, while enhancing students' employment competitiveness and industry adaptability, and provided strong support for colleges and universities to cultivate compound talents that meet the needs of globalization.

1. Introduction

Cultivating internationally competitive talents requires not only ensuring that students have a

solid academic foundation, but also enabling them to master cross-cultural communication skills and broaden their global perspectives. Against the backdrop of increasingly fierce global education competition, efficiently cultivating international talents while ensuring education quality and improving employment competitiveness remain key challenges that need to be urgently addressed in today's education field. The digital transformation of education has become a key driving force for universities to improve their internationalization level and enhance students' career development potential. The widespread use of digital education platforms and online learning tools has brought new teaching methods to colleges and universities, breaking through the limitations of previous education methods and creating a more flexible and personalized learning experience for students.

This study focuses on the role of educational digitalization in the cultivation of international talents in universities, and deeply explores its contribution to improving academic performance, expanding the scale of education, and increasing the employment rate of graduates. By conducting a before-and-after comparative analysis of a university's data before and after digital transformation, and combining qualitative research with questionnaires and in-depth interviews, this study evaluates the effectiveness of digital transformation in education in improving the quality and scale of talent training and the employability of graduates. The innovation of this paper lies in revealing the profound impact of digital transformation on the cultivation of international talents in universities through multi-dimensional data analysis, especially the specific results in terms of academic performance, number of talents cultivated and employment rate of graduates.

The second part of this paper reviews the research progress on this topic at home and abroad, and outlines the background and development of international higher education and digital transformation of education; the third part explains the implementation plan and methods of the research, covering data collection, selection of analysis tools and determination of samples; the fourth part presents the research results, focusing on the role of educational technology reform in improving academic performance, increasing the number of talent training and improving employment rate; the fifth part discusses the theoretical and practical value of the research and puts forward suggestions for subsequent research areas.

2. Related Work

In the context of globalization, the internationalization of higher education has become a core issue in the field of global education. This review aims to integrate multiple studies and explore the practices and challenges of internationalization at different levels. Finardi and Furtado aimed to reflect on how to internationalize in the difficult times of the Covid-19 pandemic from the perspective of university researchers in the Global South [1]. De and Altbach discussed in depth the historical development, conceptual connotation, influencing factors, policy measures and future challenges of internationalization of higher education[2]. Mittelmeier et al. proposed the concept of IaD and discussed in depth the case of the University of South Africa, a large-scale international distance education institution[3]. Buckner et al. explored how Canadian colleges and universities formally articulate their internationalization priorities and what arguments justify their approaches [4]. Guo et al. investigated how Chinese undergraduates interpret and experience internationalization at famous Chinese universities[5]. Zapp and Lerch explored different sociopolitical conceptual variations of the internationalization of higher education through a cross-national analysis of 442,283 research projects from 17,129 universities in 183 countries[6]. Ramaswamy et al. discussed the ideological and practical intersections between internationalization and the Sustainable Development Goals[7]. Jampaklay et al., through an in-depth analysis of the case of internationalization of Thai higher education, revealed the key factors for successful internationalization and put forward suggestions on the importance of current international student

mobility[8]. Li and Xue explored how to internationalize China's academic ecology and create world-class universities by examining the experiences and feelings of overseas returnee teachers at elite universities in China [9]. Tight discussed the meaning and application of these terms, documented their use in higher education research, and critically reviewed this research and its usefulness for higher education policy[10]. However, these studies mostly focus on the macro level, and lack the exploration of internationalization experiences and challenges at the individual level. Future research needs to pay more attention to the micro-dynamics of educational internationalization and how to find a balance between globalization and localization to promote the sustainable development and quality improvement of higher education.

3. Methods

3.1 Identification of Conditional Variables and Path Construction

In this study, identification of conditional variables and path construction[11] are one of the core analysis steps. The selection of conditional variables is based on the analysis of key factors in the cultivation of international talents in universities, including the number of international majors, the proportion of international students, the number of international curriculum standards adopted, the number of international cooperation projects, the proportion of internationally certified teachers and students' cross-cultural abilities. These variables are precisely defined and quantified to provide a scientific basis for path construction. The path construction process uses fuzzy set qualitative comparative analysis, which can handle nonlinear and interactive effects and reveal the complex causal relationship under the interaction of multiple factors. By constructing truth tables and applying logic reduction techniques, we identify the key paths to successful international talent training and clarify which combinations of conditional variables are crucial to improving talent training results. This process helps guide universities to optimize their international talent training strategies in the context of digital transformation of education[12] and provides them with more practical path options. By analyzing these conditional variables, we can provide theoretical support and practical basis for universities to formulate more precise international talent training paths.

3.2 Data Analysis Technology

The data analysis technology in this paper mainly relies on the fuzzy set qualitative comparative analysis method [13]. This method combines qualitative analysis with quantitative analysis, and explains the complex causal relationship behind the phenomenon based on set theory [14] and configurational thinking. It is particularly suitable for dealing with nonlinear and interactive effects, and can reveal the impact of different combinations of conditions on the results. In fsQCA, data encoding[15] is to calibrate the value of a variable of a case to a fuzzy set membership between 0 and 1, forming a set, where a fuzzy membership of 1 means that the case completely belongs to the set, a fuzzy membership of 0 means that the case does not belong to the set at all, and 0.5 represents the intersection or maximum fuzzy point, which means that a case is both a member of the fuzzy set and a non-member. The verification process includes receiving data, generating polynomials, calculating check codes, comparing check codes and correcting error information, among which calculating and comparing check codes are the core links to ensure the accuracy of data transmission. The following is an example of a data table, which includes professional information such as the number of international majors, the proportion of international students on campus, the number of international curriculum standards adopted, the number of international cooperation projects, the proportion of internationally certified teachers, the proportion of international students, and the participation in international exchange programs:

Table 1: Key indicators for the development of international talent training in universities

Year	International Programs	On-Campus International Student Ratio	International Curriculum Standards Adopted	International Cooperation Projects	Internationally Certified Faculty Ratio
2019	100	12%	400	50	25%
2020	110	14%	420	55	28%
2021	115	16%	440	58	32%
2022	120	15%	450	60	30%
2023	140	18%	500	65	35%

Table 1 shows the depth and breadth of international education in universities through key indicators. The "number of international majors" shows the degree of integration of education with international standards; the "internationalization ratio of students" reflects the extensiveness of students' participation in international activities; the "number of international curriculum standards adopted" indicates the international recognition of the courses; the "number of international cooperation projects" reflects the global cooperation network of the university; and the "proportion of internationally certified teachers" measures the internationalization level of the teaching staff. Through these quantitative data, we can clearly evaluate the development status of international education in universities and formulate corresponding strategies and measures accordingly to enhance the competitiveness and influence of universities in the global education environment.

3.3 Credibility and Validity of the Study

This study has taken a variety of measures to ensure credibility and validity. In terms of sample selection, the study ensures the randomness and diversity of the samples. During the data collection phase, the questionnaire design was reviewed by experts to ensure the effectiveness of the measurement tool, covering multiple dimensions such as students' academic performance, number of talents, and graduate employment rate. The in-depth interviews adopted a semi-structured interview method, focusing on the experiences and insights of university leaders, education experts and teachers in digital transformation. The design of open-ended questions helped to gain a deeper understanding of the challenges encountered and the achievements made during the transformation process. Data analysis was performed using statistical software such as SPSS, combined with descriptive statistics and correlation analysis to ensure the accuracy and scientificity of data processing. Qualitative data were collated and summarized through content analysis to supplement the insufficiency of quantitative data and further verify the research conclusions. Combining these measures, this study can effectively ensure the reliability and validity of data collection, analysis and results.

4. Results and Discussion

This study used a mixed research method to comprehensively evaluate the impact of the digital transformation of education on the development of students at a certain university by combining

quantitative and qualitative analysis. The experimental design adopts the before-and-after comparison method to collect relevant data before and after the digital transformation, conduct comparative analysis and combine it with the case study method to explore the experience of universities that have successfully implemented digital transformation. Data collection was conducted through a combination of questionnaire surveys and in-depth interviews. The questionnaires were administered to teachers, students, and administrators of a certain university to assess the frequency of use of the digital education platform, teaching effectiveness, and changes in student performance. The experimental data sources include data from a university's teaching management system, such as student grades, number of talents trained, graduate employment rate, etc., as well as first-hand data from questionnaires and interviews. Through this hybrid research method, we study how to improve teaching quality, expand the quantity and diversity of talent training, promote the improvement of interdisciplinary and cross-cultural capabilities, and provide feasible practical paths and theoretical support for the future educational transformation of universities.

4.1 The Improvement of Academic Performance through Digital Transformation of Education

In the context of the digital transformation of education, digital tools and online learning platforms have become key factors in promoting the development of international talent capabilities. By optimizing the allocation of teaching resources, the digital transformation of education has improved resource utilization efficiency and teaching quality. Online course platforms and virtual classrooms provide students with flexible learning time and personalized learning paths, effectively shortening the learning cycle. The hybrid learning model helps students combine theory with practice in internationalized courses and improves learning outcomes. Experimental data show that students' academic performance has increased by an average of 9.6 points, providing support for the cultivation of international talents. The following is specific data on the impact of online learning and hybrid learning models on students' academic performance and cross-cultural communication skills under the digital transformation of education. The data comes from a school's questionnaire survey and in-depth interviews.

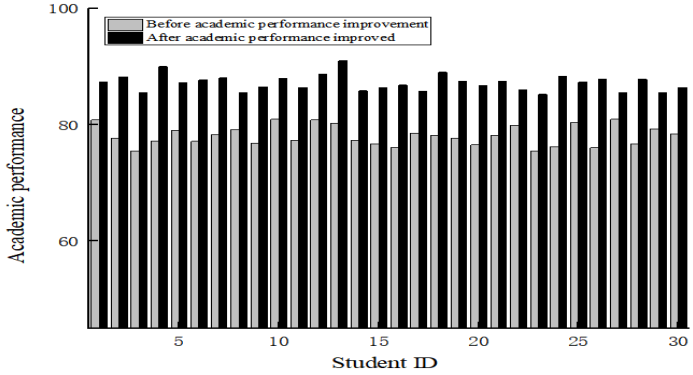

Figure 1: Comparison of students' academic performance before and after

From Figure 1, we can see that the academic performance of most students has improved. The average score before the transformation is 77.7 points, and the average score after the transformation is 87.3 points, an increase of 9.6 points. The improvement ranges from a minimum of 4.6 points to a maximum of 12.8 points, indicating that digital transformation has had a positive impact on most students. In particular, the performance of students with student numbers 4 and 24 improves significantly, indicating that digital educational resources are of great help to some

students. However, a small number of students' performance improvements are relatively small, which may be related to individual learning differences, learning attitudes, or the ability to adapt to digital learning methods. The digital transformation of education has a significant effect on the academic performance of most students.

4.2 Changes in the Number of Talent Training

Against the background of digital transformation of education, the expansion of internationalized courses and interdisciplinary projects has significantly promoted the increase in the number of talent training. Through online education platforms, virtual classrooms and international cooperation projects, educational resources have been more widely utilized to cultivate more compound talents that meet international needs. These transformation initiatives have enabled universities to break through the limitations of time and space, attract more students to participate, and increase the quantity and diversity of international talent training. For example, through online learning platforms and distance education programs, more students can participate in globalized courses, increasing the training of talents with interdisciplinary backgrounds. This not only helps expand the enrollment scale, but also enables students to gain diverse learning experiences in a globalized educational environment, thereby enhancing their international competitiveness. Figure 2 shows the change in the number of talent training before and after the transformation.

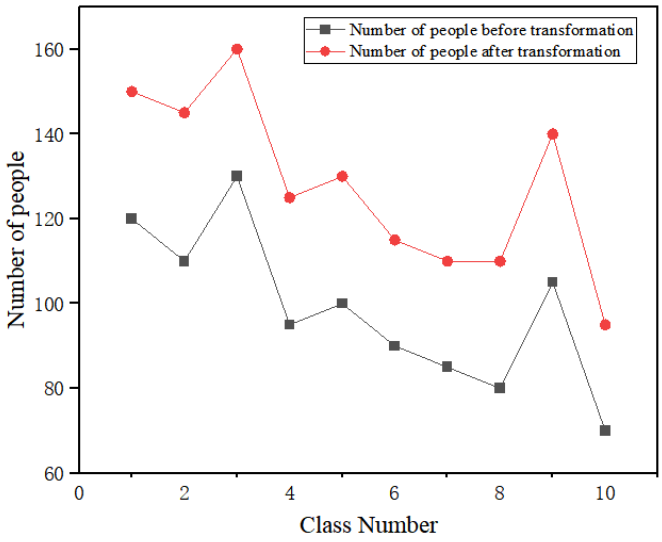

Figure 2: Comparison of the number of talents before and after the transformation

By analyzing the data in the above figure, we can see that the digital transformation of education has played a significant role in increasing the number of students in each class. The number of students in all classes increases, with the growth ranging from 23% to 36.8%, reflecting the transformation's role in promoting the scale of talent training. Class 4 has the largest increase, reaching 36.8%, which may be related to the fact that this class participates in more international courses and interdisciplinary projects. Class 3 has a relatively small increase, at 23%, but due to the small initial number of students, the absolute number of increases is relatively limited. Although there are differences in the extent of growth between classes, most classes see an increase of more than 20%, suggesting that digital transformation has a positive impact across classes, particularly in attracting more students and expanding international offerings. Overall, with the advancement of digitalization in the field of education, class sizes have increased significantly, while the number and diversity of international talents trained have increased, thereby promoting the overall

improvement of higher education outcomes.

4.3 Improvement in Graduate Employment Rate and Industry Adaptability

Through online courses and international cooperation projects, students have improved their academic performance and enhanced their employment competitiveness. Graduates with skills such as data analysis and programming are more likely to enter high-demand industries such as information technology, finance and artificial intelligence. Digital education enables students to access cutting-edge international knowledge and quickly adapt to industry changes, thereby improving their employment rate and industry adaptability, helping them obtain more employment opportunities in the global economy. Figure 3 shows the employment rate data of 10 classes of graduates from a certain university before and after the transformation:

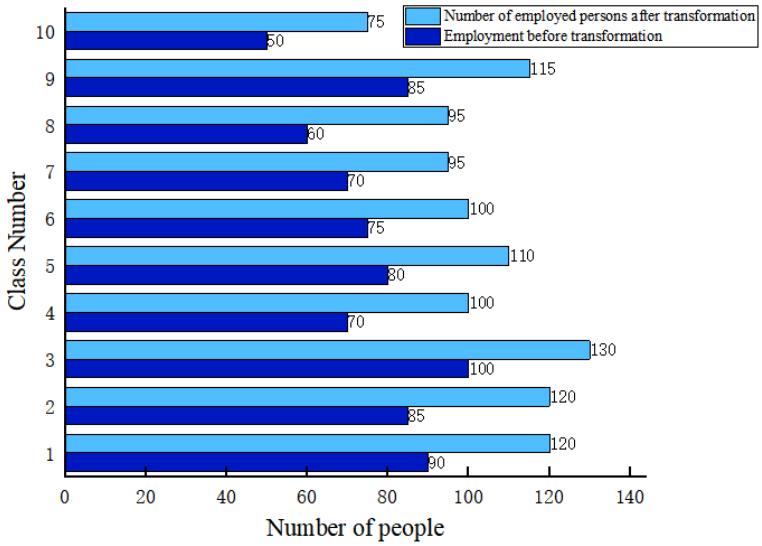

Figure 3: Comparison of graduate employment rates

According to data analysis, employment increased in all classes. The number of employed people in all classes has increased, ranging from 25 to 35 people, and the growth rate ranges from 30% to 58.3%. Among them, the number of employed people in Class 8 increases the most, by 58.3%, indicating that digital transformation has had a significant impact on this class. Overall, the number of employed students in most classes increases by more than 30%, showing the general effect of the digital transformation of education in improving students' employability. The digital transformation of education not only enhances students' digital skills and cross-cultural capabilities, but also helps them better adapt to the global job market, thereby significantly improving graduates' employment competitiveness and industry adaptability.

5. Conclusion

This study explored the impact of digital transformation of education on the cultivation of international talents in colleges and universities. The results showed that this method significantly improved students' academic performance, the number of talents cultivated, and the employment rate of graduates. Through data analysis, it was found that academic performance increased by an average of 9.6 points, the class size increased by between 23% and 36.8%, and the employment rate of graduates generally increased. In particular, with the support of interdisciplinary and internationalized courses, students' employment competitiveness and industry adaptability have been significantly improved. The research contribution of this paper is that it provides empirical

support for the relationship between the digital transformation of education and the cultivation of international talents in universities. Its practical significance lies in providing theoretical and practical basis for universities to optimize their educational structure and improve the level of international talent training in the context of globalization. However, this study also has some limitations, such as the limited sample size and the lack of in-depth exploration of the impact of individual differences on the transformation effect. Future research can expand the sample size and further analyze the differences between different disciplines and student groups to more comprehensively evaluate the long-term impact of digital transformation.

Acknowledgement

This work was supported by Innovation Research on the Blended College English Teaching Model under the Background of Artificial Intelligence, Undergraduate Teaching Reform Project of Qingdao University of Technology, 2024; Research on the Integrated Dual-Major Program Based on the Reform and Practice of College English Education, The 2023 Annual "World Languages and Cultural Studies" Project; "Shandong Model" of Digital Educational Resource Construction for University Talent Cultivation, Shandong Province "Internet+Education" Application Research Base Project.

References

[1] Finardi K R, Furtado Guimaraes F. Internationalization and the Covid-19 pandemic: challenges and opportunities for the global south[J]. Journal of Education, Teaching and Social Studies, 2020, 2(4): 1-15.
[2] De Wit H, Altbach P G. Internationalization in higher education: Global trends and recommendations for its future [J]. Policy Reviews in Higher Education, 2021, 5(1): 28-46.
[3] Mittelmeier J, Rienties B, Gunter A, et al. Conceptualizing internationalization at a distance: A "third category" of university internationalization[J]. Journal of Studies in International Education, 2021, 25(3): 266-282.
[4] Buckner E, Clerk S, Marroquin A, et al. Strategic benefits, symbolic commitments: How Canadian colleges and universities frame internationalization[J]. Canadian Journal of Higher Education, 2020, 50(4): 20-36.
[5] Guo Y, Guo S, Yochim L, et al. Internationalization of Chinese higher education: Is it westernization?[J]. Journal of Studies in International Education, 2022, 26(4): 436-453.
[6] Zapp M, Lerch J C. Imagining the world: Conceptions and determinants of internationalization in higher education curricula worldwide[J]. Sociology of Education, 2020, 93(4): 372-392.
[7] Ramaswamy M, Marciniuk D D, Csonka V, et al. Reimagining internationalization in higher education through the United Nations sustainable development goals for the betterment of society[J]. Journal of Studies in International Education, 2021, 25(4): 388-406.
[8] Jampaklay A, Penboon B, Lucktong A. Internationalization of higher education in Thailand: Promises and reality [J]. Kasetsart Journal of Social Sciences, 2022, 43(1): 183–193.
[9] Li J, Xue E. Returnee faculty responses to internationalizing "academic ecology" for creating world-class universities in China'elite universities[J]. Higher Education, 2021, 81(5): 1063-1078.
[10] Tight M. Globalization and internationalization as frameworks for higher education research[J]. Research Papers in Education, 2021, 36(1): 52-74.
[11] Li B. The construction path of innovation and entrepreneurship education in secondary vocational schools from the perspective of maker era[J]. Int J New Dev Educ, 2021, 3(2): 50-54.
[12] Oliveira K K S, De Souza R A C. Digital transformation towards education 4.0[J]. Informatics in Education, 2022, 21(2): 283-309.
[13] Rasoolimanesh S M, Ringle C M, Sarstedt M, et al. The combined use of symmetric and asymmetric approaches: partial least squares-structural equation modeling and fuzzy-set qualitative comparative analysis[J]. International Journal of Contemporary Hospitality Management, 2021, 33(5): 1571-1592.
[14] Samosir C M, Herman T. Students'Ways Of Understanding And Thinking Based On Harel'S Theory In Solving Set Problems[J]. JOHME: Journal Of Holistic Mathematics Education, 2023, 7(2): 169-179.
[15] Kocaman B. The Effect of Coding Education on Analytical Thinking of Gifted Students[J]. International Journal of Educational Methodology, 2023, 9(1): 95-106.