The Exploration of the Digital Transformation of General English Education in Higher Vocational Colleges Empowered by AI Technology

Taking Guangzhou Civil Aviation College as an Example

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ABSTRACT

The digital transformation of education is an important direction for the reform and development of higher vocational education in the new era in China. The informatization changes that Guangzhou Civil Aviation College has experienced in the field of general English teaching over the past decade can be divided into two stages: the stage of the traditional binary teaching mode combining multimedia classrooms with an English autonomous learning platform, and the stage of taking the smart classroom as the main front and leading the comprehensive digital transformation of civil aviation general English teaching with the deep integration of AI technology. Through the practice of digital transformation, the college has actively responded to the national strategy of educational digital transformation and explored a feasible practical path that combines the innovation of general English teaching in higher vocational colleges with the improvement of the level of educating.

Keywords: *Digital transformation of education, General English teaching, Teaching innovation, Higher vocational education.*

1. INTRODUCTION

In recent years, new technologies such as 5G, the Internet of Things, cloud computing, and artificial intelligence have been developing in an overwhelming trend. The digital economy has become a research hotspot globally and is also one of the fields highly valued by China. The digital transformation of education, which integrates digital technologies into all aspects of education, has become a trend in the educational reform and development of the world and China. The Central Committee of the Communist Party of China and the State Council put forward in the "Overall Plan for Deepening the Reform of Educational Evaluation in the New Era" (2021): "Utilize modern information technologies such as artificial intelligence and big data to explore the implementation of longitudinal evaluation throughout the whole process and horizontal evaluation of all elements." The Ministry of Education also proposed the requirement of implementing the strategic action of educational digitalization in its key work points in 2022, advocating "actively developing 'Internet + Education' and accelerating the digital transformation and intelligent upgrading of education." In April 2025, nine departments including the Ministry of Education jointly issued the "Opinions on Accelerating the Digitalization of Education" (Jiaoban [2025] No. 3), stating: "Adhere to digital empowerment and promote the holistic transformation of educational concepts, teaching models, and educational governance. Adhere to reform and innovation, proactively conform to the development trend of new technologies such as artificial intelligence, and improve the institutional system suitable for digital development." The digital transformation of education has been elevated to the height of a national strategy.

Over the past decade, Guangzhou Civil Aviation College (GCAC) has actively aligned with the requirements of educational informatization in the "College English Teaching Guide" (2020), implemented the trajectory of the informatization process of general English teaching, advocated that teachers make full use of digital technologies for teaching, explored the application of artificial intelligence technologies in the digital transformation of English education, and promoted the comprehensive digital transformation of the school's education. It conforms to the school's strategic deployment to achieve the goals of the "14th Five-Year Plan" of civil aviation and cultivate high-quality talents who meet the needs of the new era, possess advanced artificial intelligence capabilities and thinking, and are capable of facing the challenges of future society. [1] General English teaching, as a very important component for cultivating civil aviation talents, has undergone two stages of informatization changes in the past decade or so.

2. THE STAGE OF THE BINARY TEACHING MODE COMBINING THE MULTIMEDIA CLASSROOM MODEL AND THE ENGLISH AUTONOMOUS LEARNING PLATFORM

In 2004, the "Teaching Requirements for College English Courses" issued by the Ministry of Education put forward a new concept of the "network-based autonomous learning teaching mode": "The new teaching mode should be supported by modern information technology, especially network technology, so that English teaching is not limited by time and place and develops towards personalized and autonomous learning." [2] In line with this concept, the college established a Self-access Learning Center in 2008, which is equipped with an advanced English autonomous learning platform and a large number of electronic teaching resources, and provided an ideal learning environment for students' autonomous learning. During this stage, the goal of English teaching in the college was to cultivate students' practical English application ability in professional positions, with the main idea of emphasizing the cultivation of students' autonomous learning ability. Through the active operation of the English Self-access Learning Centre, the multimedia classrooms connected to it and the other sharing resources, a network teaching mode of college English of "teachers' face-to-face instruction + student-centred English autonomous learning" was gradually formed. A large campus learning environment was constructed where students could carry out autonomous English learning at any time and place without being restricted by time and space, enabling English teaching to transfer from the classroom to the campus and extend from the class to after-class. The construction of this mode takes teachers' face-to-face instruction as the main body and students' autonomous learning as the auxiliary as the basic principle, and is composed of the following parts:

2.1 Construction of the English Self-access Learning Centre

GCAC established an English Self-access Learning Centre with 200 seats, providing an ideal learning environment for students' autonomous learning.

2.2 Construction of the English Learning Platform

GCAC constructed an English teaching and autonomous learning platform, which contains a vast amount of learning resources, covering textbooks, question banks (including various tests such as CET-4, CET-6, Level A, and IELTS), popular textbooks, extensive and intensive reading materials, various mainstream and characteristic courses, movies, songs, news, speeches, etc. Students can independently choose the learning content and form according to their own learning level and interests, maximizing the autonomy of the learning subjects.

2.3 Construction of the Academic Performance Evaluation Mode

The English Language Learning Centre has changed the traditional way of teachers' sole summative evaluation. The academic performance evaluation mode of students has been transformed into the combination of teachers' evaluation and the weighting of the English autonomous learning platform, increasing the proportion of the formative evaluation of autonomous learning during the semester in the academic performance. This evaluation mode attaches importance to the learning process and the self-growth track of each student, enabling students to maintain continuous learning motivation.

The network education mode that integrates the traditional teaching method with students' autonomous learning has shown remarkable results in the improvement process of general English teaching in the college, playing an important role in promoting the improvement of the quality of general English teaching in the college and stimulating students' enthusiasm for extracurricular English learning.

3. THE STAGE OF DIGITAL TRANSFORMATION OF CIVIL AVIATION GENERAL ENGLISH TEACHING WITH SMART CLASSROOMS AS THE MAIN FRONT AND EMPOWERED BY AI TECHNOLOGY

With the development of new technologies such as mobile Internet technology, the Internet of Things, big data, and artificial intelligence, the applicable scenarios of education and teaching, the role behaviours in the teaching process, and the digital literacy of both teachers and students have all been undergoing significant changes. Especially during the pandemic, the teaching process became more reliant on the combination of various network technologies and teaching technologies, gradually forming an online-offline hybrid teaching model that integrates multiple teaching methods, teaching technologies, and teaching tools. Subsequently, with a series of policies related to digital teaching successively issued in China and the implementation of the national strategic action for education digitization, it has urged the general English teaching in GCAC to urgently develop towards a student-centred and data-driven intelligent education and teaching model. Thus, the college has entered the latest stage of English teaching reform: taking smart classrooms as the main front and enabling the digital transformation of civil aviation general English teaching with the empowerment of AI.

3.1 The Connotations of the Digital Transformation in This Stage

The overall principle of digital teaching practice in this stage is to take smart classrooms as the main front, rely on new technologies such as the Internet, big data, and artificial intelligence, explore the transformation of the "Internet +" teaching and learning model, connect all levels of teaching activities before, during, and after class, organically integrate online and offline teaching, as well as real-scene teaching and virtual teaching, and achieve the reform and reconstruction of the general English teaching model. The connotations of the digital transformation in this stage are mainly reflected in the following aspects.

3.1.1 Deep Integration of Digital Technology with the English Teaching Process and Teaching Content

Teachers are the organizers of teaching activities, as well as the guides and participants of learning activities. General English teaching under digital conditions is to construct an online-offline hybrid English teaching environment through the deep integration of digital technology with the English teaching process and teaching content. Teachers make full use of intelligent technologies to carry out heuristic, inquiry-based, discussion-based, and participatory English classroom teaching activities, and create a new intelligent teaching mode featuring networked, immersive, and intelligent characteristics.

3.1.2 Students' Learning Moves Towards the Smart Learning Mode

GCAC empowers education through digital technology. It constructs smart classrooms by using hardware devices such as interactive large screens and smart whiteboards, and enhances the convenience of teachers' teaching and improves students' enthusiasm and engagement in learning by using software tools such as smart attendance, interactive teaching, and classroom recording and broadcasting. At the same time, intelligent English teaching platforms such as iFLYTEK AI Teaching and iSmart are introduced. Relying on technologies such as big data and AI, the learning situations of students are tracked in real time, and accurate learning maps and profiles are established for each student to achieve data-driven teaching. Teachers also adjust their teaching methods and strategies according to the differences and personalized characteristics of students' English learning based on this, and provide students with personalized English curriculum teaching plans.

3.1.3 The Transformation of Teachers' Literacy Development, with Digital Literacy Becoming an Important Link in Teachers' Ability Enhancement

The deep integration of digital technology and education will surely bring challenges and pressures to teachers. On one hand, the changes in new technologies such as artificial intelligence require teachers to actively adapt to informatization, constantly change their ways of thinking, and adjust their own positioning. On the other hand, technological development also provides teachers with diversified development paths, leading to the formation of various teaching and research organization forms such as online famous teacher studios, online teaching and research alliances, online teaching and research offices, and virtual teaching and research offices. These new teaching and research forms enable college teachers to have more opportunities to participate in higher-quality teaching and research teams, and more effectively promote the development of teacher communities and individual teachers.

3.1.4 The Transformation of Curriculum Evaluation, Moving Towards Diversified Comprehensive Evaluation

Digital technology has promoted the transformation of the evaluation of English courses from the mode of “teacher evaluation + weighted scores” from the English self-study platform to digital diversified comprehensive evaluation. Teachers, through the monitoring, data collection, evaluation, and feedback of students' learning processes, and relying on the data generated throughout the semester and academic process, enable to develop the evaluation of students towards a refined, dynamic, and diversified mode, more accurately reflecting the comprehensive development of students, and achieve a balanced and objective learning evaluation. In addition, these detailed data also serve as the basis for the refined operation of educational management, helping to make scientific decisions, effectively conduct remote supervision, prevent risks, and improve the guarantee level of educational quality.

3.2 Specific Practices of Smart Classrooms Leading the Digital Transformation of General English Teaching in Civil Aviation

Due to its highly international nature, the civil aviation industry has extremely high requirements for the English proficiency of its employees. Guided by national policies on educational digital transformation and in line with the needs of talent cultivation programs for civil aviation higher vocational education, as well as considering the current practical issue of "one university with three campuses" in GCAC, the overall construction goal of this English teaching reform is to start from individual points and gradually expand, promoting layer by layer, so as to achieve the digital transformation of civil aviation general English teaching in the whole university, with smart classrooms as the main front and empowered by AI technology. The smart classrooms constructed in GCAC are divided into several application scenarios, including smart classrooms for interactive teaching, smart classrooms for group discussions, and smart classrooms for cross-campus teaching. Each of these scenarios has its own focus, aiming to solve different prominent problems and meet different teaching needs.

3.2.1 Multimedia Smart Classrooms for Interactive Teaching

Multimedia smart classrooms for interactive teaching are the most basic form of the English teaching scenario construction in GCAC. Ordinary multimedia classrooms can be transformed into interactive smart classrooms through lightweight renovation, which represents a continuous innovation of the traditional teaching environment. Smart classrooms provide effective solutions for the original classroom teaching in terms of intelligent classroom management, diverse classroom interaction methods, instant data statistics, and convenient learning feedback. Relying on smart whiteboards and smart classroom interaction systems, through functions such as capturing questions, random answering, competitive answering, and photo uploading, effective interactions can be achieved between teachers and students, as well as among students. The initiative and enthusiasm of students in classroom learning are fully mobilized, and an active classroom atmosphere is created.

3.2.2 Smart Classrooms for Cross-campus Teaching

The construction of smart classrooms can take cross-campus synchronous classrooms or live broadcast classrooms as the main application scenarios to achieve the sharing of teaching classrooms, teaching resources, and teaching tools, thus meeting the demand for cross-campus linkage among different campuses and bringing convenience to the teaching of GCAC with "one university and three campuses". Smart classrooms for cross-campus teaching mainly rely on Internet technology, recording and broadcasting systems, smart classroom platforms, etc. They overcome the barriers of geographical space, enabling teachers and students from the three campuses to connect with each other, ensuring the effective utilization and sharing of high-quality educational resources, and greatly enhancing the educational value of the team of renowned teachers. With the support of the classroom interaction system and mobile devices, students in different campuses and different classrooms can carry out corresponding classroom teaching activities synchronously under the guidance of teachers, solving the problems of insufficient teaching resources such as teaching staff and uneven distribution of resources across campuses in our college.

3.2.3 Diverse Teaching Resources, Teaching Methods, and Teaching Platforms

In recent years, with the implementation of the national strategic action for educational digitization and the rapid development of "Internet + Education", various teaching resources and scenarios have emerged, such as online classrooms, simulated classrooms, and digital simulation training. Notably, Massive Open Online Courses (MOOCs) have risen rapidly. Online education resource platforms like the National Smart Education Public Service Platform have gathered high-quality online courses and teaching materials at home and abroad, providing a rich and diverse range of excellent national and provincial teaching materials, which greatly expands the learning space for college students. GCAC has also actively relied on major online platforms to construct various types of general English online courses, such as Spoken English, English Phonetics, and English Writing. These resources both on and off campus provide more abundant support for general English teaching, effectively solving the problems of shortages and limitations of teaching resources for English teachers.

With the rapid development of big data and artificial intelligence technologies, various new educational methods have been spawned. With the assistance of educational technologies such as AI assistants, AI marking systems, and virtual humans, teachers' teaching designs are becoming more interactive and innovative. Teachers can use intelligent teaching platforms and their AI technologies to track students' learning situations in real time, understand students' learning patterns, thinking characteristics, and areas of interest, and establish accurate learning maps and profiles for each student. Based on the differences and personalized characteristics of students' English learning, teachers can also use AI technologies to develop appropriate differentiated English education courses and evaluation systems for different students.

In the process of promoting the digital transformation of education, GCAC has applied different general English teaching platforms according to the needs of different general English courses. For Spoken English, the iFLYTEK AI Classroom and FiF Oral Training System are adopted. The iFLYTEK AI Classroom is a smart teaching platform created by iFLYTEK Co., Ltd. based on new technologies such as artificial intelligence, big data, and cloud computing. Centering on teaching links before, during, and after class, this platform provides personalized teaching and learning experiences for teachers and students through dynamic teaching data analysis. The FiF Oral Training System is a teaching and management system developed by iFLYTEK Co., Ltd. based on its core intelligent speech technology, which is equipped with rich intelligent assessment and training content for English listening and speaking. [3] The FiF Oral Training System plays a positive role in helping students improve their oral English proficiency and meeting the needs of teachers and students to flexibly carry out English teaching activities. For the Comprehensive English course, the WELearn English Teaching Platform of Shanghai Foreign Language Education Press is adopted. This platform is integrated with the textbooks selected for college English in GCAC, providing digital courses and lesson preparation resources, covering tasks such as listening, speaking, vocabulary, and translation, supplemented by micro-lessons and audio-video resources to assist students in language learning. The platform functions cover planning and

evaluation, teaching, learning tracking, and assignment testing, etc. The planning and evaluation function enables personalized teaching evaluation; the teaching function supports resource projection and classroom interaction, enhancing the interest; the learning tracking function allows teachers to understand students' learning situations in real time and adjust teaching strategies; the assignment and testing function provides various types of assignments and test question resources, supporting intelligent marking. Through this platform, teachers can easily prepare lessons, conduct teaching, and track students' learning situations in real time, while students can achieve autonomous learning and improve their language abilities. Of course, in addition to the above two main intelligent teaching platforms, some teachers from various teaching and research sections and research groups will also, according to specific teaching requirements, their own abilities, habits, and teaching accumulations, develop courses with their own personalized characteristics on various teaching platforms such as Chaoxing, Vocational Education Cloud, ClassPai, and Blackboard Teaching Platform.

3.3 The Efficiency of the Transformation of General English Teaching Towards Data Intelligence

Through the second-stage reform of English teaching, the general English teaching in GCAC has taken smart classrooms as the main front and been empowered by AI technology to achieve digital transformation, resulting in a qualitative improvement in aspects such as teaching efficiency.

Firstly, it is developed to be data-driven and intelligently assisted. By applying big data technology, the data generated throughout the entire teaching process are mined, stored, and analysed. Artificial intelligence technology is utilized to monitor students' learning progress, evaluate teaching effectiveness, and provide recommended teaching plans. With the help of data and intelligent analysis tools, it assists GCAC in establishing a normalized evaluation system and promotes the innovative development of the entire college’s general English teaching management work.

Secondly, mobility enables activities of both inside and outside the classroom to be connected. It supports wireless networks (including 5G) and allows students to bring their own devices (such as mobile phones, laptops, iPads, etc.) to participate in teaching activities. It breaks the spatial limitations, supports combined class teaching across campuses, and enables students to connect to the classroom and participate in classroom interactions from the dormitory or even off-campus under special circumstances. It also breaks the time limitations. Teaching activities that are not completed during class can be extended to after class, and teaching activities completed after class can be brought back to class for explanation and demonstration.

Thirdly, diversified curriculum innovation provides an immersive learning experience. According to the teaching needs of students from different majors, different courses, and different types of classes, as well as the individual abilities, habits, and teaching accumulations of English teachers, various teaching platforms are used to design diverse application scenarios and create teaching content that matches the teaching objectives and suits the teaching environment.

Fourthly, the digitalization of general English is integrated with the digital campus. The digital reform of general English teaching adheres to the standards and specifications of the school's digital construction, makes full use of the existing resources of the school, avoids general English teaching from becoming an information island within the digital campus, and becomes an organic part of the digital campus.

4. THE FUTURE DEVELOPMENT OF THE TRANSFORMATION OF GENERAL ENGLISH TEACHING TOWARDS DATA INTELLIGENCE

With the progressive advancement of the digital transformation project of civil aviation general English teaching in GCAC, which takes smart classrooms as the main front and is empowered by AI technology, the future transformation of general English teaching towards data intelligence can be carried out in the following aspects.

Firstly, it will be necessary to intensify the research and development efforts in constructing a new data-driven intelligent teaching mode.

The reform of digital teaching and its intelligent upgrading rely on technological support to achieve innovation in the interaction methods between teachers and students, transforming the traditional education mode into an intelligent teaching system. However, all these can only be realized in specific teaching implementations. This requires teachers, based on the characteristics of the era and the teaching objects, etc., to closely integrate

digitization into the teaching process through intelligent learning environments and tools, focusing on core links such as curriculum design, implementation process, students' research-based learning, and educational evaluation. By using data analysis to enrich every link of education, teachers can promote the transformation of teaching methods and systems and construct a new modern intelligent education mode dominated by data-driven approaches.

Secondly, teacher training activities should be continuously carried out to enhance the digital education and teaching capabilities of English teachers.

With the rapid development of emerging technologies, it is of great urgency to improve teachers' capabilities in digital teaching. Teachers with high-level information literacy are able to effectively respond to the digital transformation of education. This undoubtedly requires teachers to invest a great deal of time and energy. Moreover, more than half of the English teachers are female. Therefore, how to balance family and career and how to continuously carry out teacher training activities to enhance the digital education and teaching capabilities of English teachers are also among the directions that should be actively planned for in the future.

Thirdly, the construction of teaching resources for general English courses with civil aviation characteristics needs to be further promoted.

Establishing a teaching resource system suitable for the major groups in GCAC is directly related to the realization of the talent cultivation objectives of these major groups. In the construction of teaching resources, according to the different English requirements for talent cultivation in various major groups in civil aviation, continuous exploration and innovation should be carried out, teaching resources should be continuously optimized, and the construction of diversified teaching resources should be actively promoted. This is to provide students with more abundant, personalized, and flexible learning resources, so as to achieve a sustainable development of improving students' English learning effects and cultivating their comprehensive qualities.

5. CONCLUSION

With the rapid application of new technologies such as digitization, big data, cloud computing, and artificial intelligence in the global civil aviation industry, intelligent aviation has become a globally recognized trend of development for the future. Guangzhou Civil Aviation College, as a full-time public regular higher education institution directly under the Civil Aviation Administration of China and the earliest independent institution implementing higher vocational education in the civil aviation field, and as the national team, main force, and main base for cultivating high-level technical talents in civil aviation, its general English education should also conform to the strategic goal of the country's promotion of educational digital transformation. It should actively explore more scientific and effective teaching methods and means, and be committed to cultivating high-quality talents for China's civil aviation industry who can meet the requirements of the new era, possess advanced artificial intelligence skills and thinking models, and are able to face the challenges of future society.

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