

A Study on the Construction of a Digitalized Training System for MTI Students from the Perspective of Government-Industry-Education Integration

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Abstract: *Current Master of Translation and Interpreting (MTI) education faces practical dilemmas such as the disconnect between political literacy and professional competence, insufficient industry-education integration, and lagging digitalization. This study adopts literature review, case analysis, and simulation methods to construct a digitalized training system for MTI students from the perspective of government-industry-education integration (GIEI). The research first clarifies the collaborative relations among the government, industry, and educational institutions in talent cultivation. It then proposes five construction principles: synergy, technology empowerment, operability, learner-centeredness, and continuous improvement. Finally, it designs four core modules at the operational level: an online learning and practice platform, a digital resource repository (including political education materials and corporate projects), a big data analytics and personalized learning system, and a social learning and collaborate mechanism. The system aims to achieve an organic integration of government guidance, industry demands, and institutional education, providing theoretical reference and practical pathways for cultivating applied translation talents with strong political awareness, excellent translation competence, and superior digital literacy.*

Keywords: *GIEI; MTI; digitalized training system; big data analytics*

1. Introduction

With the deepening advancement of Chinese-style modernization, the nation's demand for high-level applied translation talents has become increasingly urgent. As the core channel for cultivating professional translation talents, the Master of Translation and Interpreting (MTI) program directly impacts the construction of China's international discourse system, the globalization of Chinese culture, and the enhancement of international communication capabilities. The reform of graduate education has called for strengthening the "practical exploration of the reform of professional degree graduate training models" and the "research on industry-education integration graduate training models," which points the direction for MTI education reform.

However, current MTI education still faces three practical dilemmas. First, there is a disconnect between political literacy and professional competence development. Translation talents must first possess solid political awareness to serve the broader cause of Chinese-style modernization, yet the integration of "curriculum ideology and politics" with translation practice teaching in existing curricula remains superficial, lacking a systematic embedding mechanism. Second, the depth of industry-education integration is insufficient. There is a significant gap between corporate translation projects, industry standards, and classroom teaching, resulting in graduates often needing a long time to adapt to the professional environment after graduation. Third, the level of digitalization lags behind. New-generation information technologies such as big data and artificial intelligence have profoundly changed the operational models of the translation industry, yet many MTI training institutions still rely on traditional models in terms of teaching resources, practice platforms, and evaluation methods, struggling to meet the learning needs of "digital natives."

This study aims to construct a digitalized training system for MTI students from the perspective of government-industry-education integration (GIEI). Specifically, the research intends to achieve the following goals. First, it clarifies the collaborative mechanisms and respective responsibilities of the government, industry, and education sectors in MTI talent cultivation. Second, it designs a digitalized training system framework comprising four core modules: an online learning and practice platform, a

digital resource repository, a big data-driven personalized learning system, and a social collaboration mechanism.

The theoretical significance of this study lies in enriching the application of the GIEI theory in the field of translation education and filling the gap in existing literature regarding digitalized training systems for MTI programs. Its practical significance lies in providing operable and replicable reference schemes for MTI education reform at Northwest Minzu University and similar institutions, helping to cultivate high-level applied translation talents with strong political awareness, excellent translation competence, and superior digital literacy.

2. Concept Definition and Literature Review

2.1. Definition of Core Concepts

GIEI is a concept developed from the foundation of “industry-education integration,” emphasizing the collaborative education mechanism among the government, industry, and educational institutions [1]. In this context, “government” refers to government authorities and educational administrative departments, undertaking the functions of policy guidance, resource coordination, quality supervision, and ideological and political direction control. “Industry” refers to translation service enterprises, language service industries, and related sectors, providing real projects, industry standards, practice platforms, and professional mentors. “Education” refers to universities and training institutions, responsible for curriculum design, teaching implementation, degree conferral, and talent cultivation quality assurance.

Different from traditional “school-enterprise cooperation,” GIEI highlights the government’s coordinating and leading role. Particularly in the alignment of curriculum ideology and politics, talent cultivation goals, and national strategies, the government is an indispensable leading force. The political requirements of MTI training (such as serving Chinese-style modernization and telling China’s stories well) determine the necessity of the government-industry-education integration model.

2.2. Theoretical Foundations

2.2.1. Industry-Education Integration Theory

Industry-education integration theory originated in the field of vocational education[2], emphasizing the deep alignment between the education system and the industry system, including the alignment of talent cultivation goals, curriculum content, teaching processes, teaching staff, and evaluation standards. In the field of higher education, industry-education integration has expanded to professional degree graduate education, becoming a core pathway for improving the quality of applied talent cultivation. This theory provides the basic framework for “school-enterprise” collaborative education for this study.

2.2.2. Collaborative Education Theory

Collaborative education theory emphasizes the division of labor, collaboration, and resource integration among multiple stakeholders (government, schools, enterprises, industry organizations, etc.) in the talent cultivation process[3]. This theory holds that no single stakeholder can independently accomplish the task of high-quality applied talent cultivation. It is necessary to establish a collaborative mechanism of “shared interests, shared responsibilities, shared resources, and joint talent cultivation.” This study incorporates the government as a collaborative stakeholder, constructing a three-dimensional “government-industry-education” collaborative framework.

2.2.3. Digital Learning Theory

Digital learning theory encompasses technology-driven teaching concepts such as personalized learning, blended learning, and learning analytics[4]. Among these, Learning Analytics technology achieves precise diagnosis and intervention in the learning process by collecting and analyzing learners’ behavioral data, providing technical support for personalized learning. This theory provides direct theoretical basis for the “big data analytics and personalized learning” module in this study.

2.3. Related Research

Domestic research on the application of industry-education integration in translation programs began around 2010 and has shown rapid growth in recent years. Existing research mainly focuses on three

directions. The first is the exploration of school-enterprise cooperation models [5], such as “translation workshops” [6], “order-based training,” and “corporate mentorship systems.” The second is curriculum system reform, emphasizing the introduction of real corporate projects into classroom teaching [7]. The third is the construction of practice bases, discussing the operational mechanisms and management models of off-campus internship bases [8].

However, existing research also has obvious shortcomings. Most studies remain at the level of “industry-education” binary interaction, neglecting the key role of educational administrative departments in policy guidance, standard setting, and ideological and political direction control. Moreover, most research consists of experience summaries, lacking a systematic theoretical framework.

With the development of AI and big data technologies, the application of digital technologies in translation teaching has become a research hotspot. Existing research involves computer-assisted translation (CAT) tool teaching, corpus-assisted translation teaching, post-editing competence cultivation for machine translation, and the design and application of online translation teaching platforms. Some studies have begun to attempt using learning analytics technology to track students’ translation learning behaviors, but most remain at the level of descriptive statistics, lacking in-depth mining and personalized intervention mechanisms.

It is worth noting that holistic research on “digitalized training systems” for MTI is extremely scarce. Results from the CNKI database search show that research combining the three keywords of “government-industry-education integration,” “digitalized training,” and “MTI” is currently non-existent, which provides an innovative space for this study.

3. Construction of a Digitalized Training System for MTI Students from the Perspective of GIEI

3.1. Alignment Analysis of the Inherent Requirements of GIEI and MTI Training Objectives

To construct an MTI digitalized training system based on GIEI, it is first necessary to clarify the functional positioning of the three parties — “government,” “industry,” and “education” — in translation talent cultivation and their corresponding relationship with MTI training objectives.

3.1.1. Government Dimension: Embedding Mechanism of Political Literacy and Curriculum Ideology and Politics

The core responsibility of the government (including educational administrative departments) in the MTI training system is to ensure that talent cultivation aligns with national strategic needs and ideological security. Specifically, the government fulfills its role by establishing national standards and quality norms for translation talent cultivation, guiding the construction of curriculum ideology and politics content systems, providing policy support and financial guarantees, and establishing a qualification certification system for translation talents (e.g., the CATTI examination).

The connection point with MTI training objectives lies in “political awareness” and “professional ethics.” Translation work is not only language conversion but also cultural transmission and value expression. Translation talents with solid political literacy can consciously serve the national strategies of “telling China’s stories well” and “spreading China’s voice.” Therefore, the “government” element in the GIEI model is not an external addition but an inherent requirement of translation talent cultivation.

3.1.2. Industry Dimension: Connecting Path of Professional Competence and Corporate Projects

The core responsibility of the industry (translation service enterprises, language service industries) in the MTI training system is to provide authentic practice scenarios and professional competence standards. This includes providing real corporate translation projects as teaching cases, assigning industry mentors to participate in course teaching and practice guidance, providing feedback on the latest technological developments and talent demand changes in the industry, and participating in the quality evaluation of talent cultivation.

The connection points with MTI training objectives lie in “translation practice competence,” “tool use competence,” and “professionalization literacy.” Deep participation from the industry side can effectively bridge the gap between classroom teaching and professional practice, enabling students to receive training close to the real working environment while still in school.

3.1.3. Education Dimension: Digital Teaching Supply and Evaluation System Construction

The core responsibility of the school (training institution) in the MTI training system is to integrate

resources from both the government and industry sides and transform them into systematic educational and teaching supply. This includes: designing a curriculum system that integrates GIEI; building a digital learning and practice platform; organizing the teaching process and quality monitoring; and implementing academic evaluation and degree conferral.

The connection points with MTI training objectives lie in the cultivation of “systematic translation theoretical knowledge,” “multicultural knowledge,” and “comprehensive literacy.” As the hub of collaborative education, the school needs to transform government requirements and industry demands into operable and evaluable teaching activities. Table 1 shows the division of responsibilities among the government, industry, and education parties in the MTI digitalized training system.

Table 1: Division of responsibilities among government, industry, and education parties in the MTI digitalized training system.

Dimensions	Government	Industry	Education
Core Responsibilities	Policy guidance, ideological and political direction control, quality supervision	Project provision, standard reference, mentor assignment	Curriculum design, teaching implementation, degree conferral
Objective Alignment	Political literacy, professional ethics	Practice competence, tool use	Theoretical knowledge, comprehensive literacy
Resource Input	Policy documents, certification systems, financial support	Real projects, industry data, corporate mentors	Teaching staff, curriculum system, campus facilities
Process Participation	Publishing learning materials, organizing qualification examinations	Providing cases, guiding practice, providing demand feedback	Organizing teaching, managing platform, conducting evaluation
Evaluation Dimension	Ideological and political compliance, certification pass rate	Job competence, employment quality	Academic performance, graduation rate

3.1.4. Tripartite Synergy

The government, industry, and education parties are not simply superimposed but form a synergy of “objectives-resources-process-evaluation.” The government establishes the political direction and quality standards for talent cultivation; the industry provides practice resources and competence benchmarks; the school integrates resources to implement the teaching process; and the translation talents ultimately cultivated give back to the industry and serve the national strategy. This synergistic relationship is the theoretical prerequisite for constructing a digitalized training system. Figure 1 intuitively presents the logical relationship of the tripartite collaborative education path among government, industry, and education.

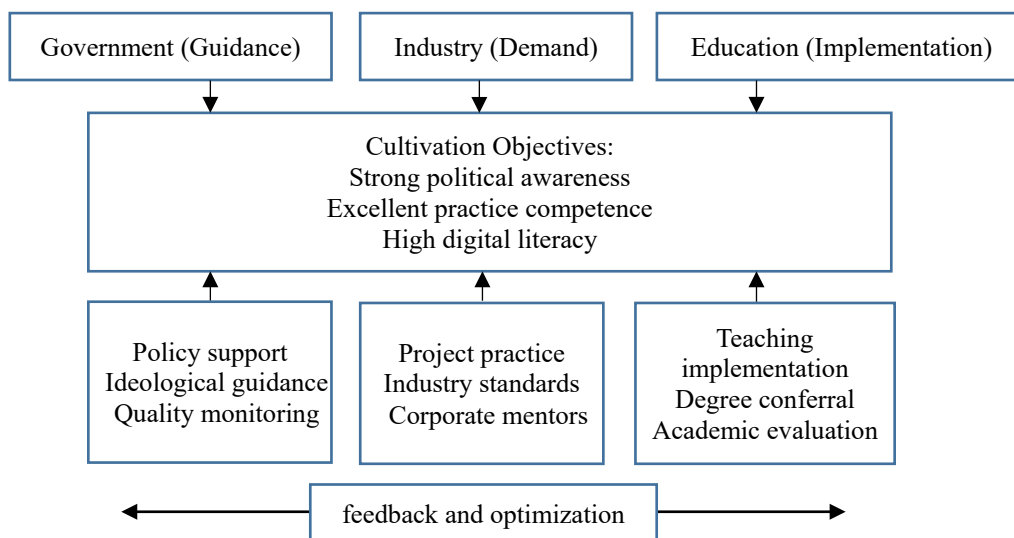


Figure 1: The path of government-industry-education collaborative education.

3.2. Construction Principles of the Digitalized Training System

Within the logical framework of government-industry-education integration, this study proposes that the construction of an MTI digitalized training system should follow the following five principles.

3.2.1. The Principle of Synergy

The principle of synergy is the primary principle of the GIEI model, emphasizing the coordinated cooperation among the government, industry, and education parties in areas such as training objectives, resource input, process management, and quality evaluation. Specifically, this is reflected in the following aspects. Training objectives should simultaneously meet national strategic needs (government), industry employment standards (industry), and educational requirements (education). Resource construction should be jointly invested in and shared by the three parties. The teaching process should introduce corporate projects and government certification standards. Quality evaluation should incorporate multidimensional information including government assessment, industry feedback, and school evaluation.

In a digitalized environment, synergy can be achieved through the “multi-role access” function of online platforms—the government can publish policy documents and ideological and political learning materials, enterprises can upload real translation projects, and schools can organize teaching and assessment, with each of the three parties performing their respective roles and sharing information on the same platform.

3.2.2. The Principle of Technology Empowerment

The principle of technology empowerment emphasizes that digital technology is not merely an upgrade of teaching tools but a systematic reconstruction of the training model. This principle requires the following. First, technology should permeate the entire training process, rather than being applied locally only in certain links. Second, technology should serve the core goal of competence cultivation, rather than being pursued for technology’s own sake. Third, technology should realize functions that traditional models cannot achieve, such as big data-driven personalized learning and immersive practice in virtual simulation environments.

Specifically, technological means such as online learning platforms, digital resource repositories, big data analytics systems, and intelligent assessment tools should be organically integrated to form a digital ecosystem covering the entire process of “teaching, learning, practicing, evaluating, and managing.” The core value of this system lies in improving training efficiency (learning anytime, anywhere), enhancing learning authenticity (simulating real project scenarios), and achieving precise intervention (personalized learning recommendations).

3.2.3. The Principle of Operability

The principle of operability requires that the system design should fully consider implementation conditions and resource constraints to avoid being overly idealized and unable to be implemented. Specifically, this includes the following aspects. Platform construction should prioritize the use of existing infrastructure (such as the school’s existing online teaching platforms and corpus resources) to avoid redundant investment. Resource digitalization should be promoted in stages, giving priority to digitizing frequently used ideological and political materials and typical corporate cases. Big data analytics should start with basic functions (such as tracking learning duration and homework completion status) and gradually transition to in-depth mining.

3.2.4. The Learner-Centered Principle

Being learner-centered is the core concept of digital education, emphasizing that the construction of the training system should serve students’ learning needs and developmental patterns. In the MTI digitalized training system, this principle is reflected in the following aspects. Teachers design learning content to allow students free selection according to their own foundation and interests (such as translation projects at different difficulty levels). The platform helps students arrange personalized learning pace (such as combining asynchronous learning with synchronous tutoring). Learning feedback should be immediate, specific, and actionable (such as intelligent systems annotating and explaining error types in translation assignments). Learning paths should support dynamic adjustment (pushing the most suitable practice tasks based on learning data).

The big data analytics and personalized learning module is precisely the technical implementation means of this principle. By collecting students’ learning behavior data, the system can construct a

“competency profile” for each student and recommend the translation types and difficulties that most need intensive training accordingly.

3.2.5. The Principle of Continuous Improvement

The principle of continuous improvement requires that the digitalized training system possess the capacity for self-optimization and iterative updating. The translation industry is experiencing rapid technological development (such as the continuous improvement of machine translation quality and post-editing becoming a mainstream working mode), and the talent cultivation system must keep pace with the times.

4. Specific Construction Content of the MTI Digitalized Training System

Based on the construction logic and five principles proposed above, this section elaborates on the specific content of the MTI digitalized training system from the perspective of government-industry-education integration at the operational level. The system consists of four core modules: an online learning and practice platform, a digital resource repository, a big data analytics and personalized learning system, and a social learning and collaboration mechanism. These four modules support each other and share data, forming a digital ecosystem covering the entire process of “teaching, learning, practicing, evaluating, and managing.”

4.1. Design of the Online Learning and Practice Platform

The online learning and practice platform serves as the physical carrier and technical foundation of the entire digitalized training system. The platform design follows the principles of “multi-role access, full-process coverage, and mobile support,” providing a unified operational space for the four parties: government, enterprises, teachers, and students.

4.1.1. Platform Architecture Design

The platform adopts a modular layered architecture, which is divided from top to bottom into the user layer, function layer, data layer, and infrastructure layer.

The user layer sets up four types of role entrances—administrator (school academic affairs), teacher, corporate mentor, and student. Government personnel can publish policy documents and ideological and political learning materials through administrator accounts or dedicated channels. The function layer contains five major functional modules: course learning, practice projects, resource center, assessment and feedback, and interactive communication. The data layer stores student profiles, learning behavior data, translation work data, evaluation data, resource metadata, and the like. The infrastructure layer relies on the school’s existing servers and cloud services to ensure the stable operation of the platform.

4.1.2. Core Functional Modules

(1) Course Learning Module

The course learning module supports functions such as online course publication, video learning, courseware download, assignment submission, and online testing. Teachers can create SPOCs (Small Private Online Courses) to digitize translation course content. The platform supports learning progress tracking, automatically recording information such as the duration of students’ video viewing, the time nodes of assignment completion, and test scores.

(2) Practice Project Module

This is the core module reflecting “industry-education integration.” Corporate mentors can upload desensitized real translation projects to the platform, and students can claim and complete translation tasks online. The project process simulates real work scenarios: task publication → claiming → translation → submission → review → feedback → finalization. The platform supports group collaboration, simulating the working mode of corporate project teams.

(3) Resource Center Module

The resource center module centrally stores digital textbooks, ideological and political learning materials, translation case libraries, terminology databases, corpora, and other resources. The resources support multi-dimensional retrieval (by language, field, difficulty, and type) and can be personalized recommended based on students’ learning progress.

(4) Assessment and Feedback Module

The assessment and feedback module integrates three assessment methods: intelligent scoring, peer review, and mentor evaluation. Intelligent scoring is suitable for objective question types (such as terminology translation and grammar correction). Peer review is used for the preliminary screening of translation works. Mentor evaluation (including corporate mentors) serves as the final review. All evaluation results are aggregated to form students' competence development portfolios.

(5) Interactive Communication Module

The interactive communication module provides functions such as instant messaging, forum discussions, online Q&A, and virtual meeting rooms, supporting real-time interaction between teachers and students and among students. Corporate mentors can conduct regular online Q&A sessions, and government personnel can publish policy updates through the announcement board.

4.1.3. Mobile Terminal Support

The platform simultaneously develops mobile terminal applications (APP or WeChat mini-program), supporting students to complete course learning, project claiming, resource browsing, discussion and communication, and other operations on their mobile phones. The mobile design fully considers fragmented learning scenarios, supporting functions such as voice input translation, photo text recognition, offline material download, etc., which helps students realize "learning and practicing anytime, anywhere."

4.2. Digital Textbook and Resource Construction

Digital resources are the core content assets of the platform and also the concrete carriers of government-industry-education integration. Resource construction follows the principles of "unified standards, categorized construction, and continuous updating."

4.2.1. Digitalization of Ideological and Political Translation Materials

Ideological and political translation materials reflect the "government" dimension and aim to integrate curriculum ideology and politics into translation professional education. The specific construction content includes the following databases.

Bilingual Database of Current Affairs Documents collects official translations of important documents such as multi-language versions of *The Governance of China*, *Government Work Reports*, and *The Report to the 20th National Congress of the Communist Party of China*, for students' research and learning.

Red Translation Case Database compiles translation cases on themes such as the history of the Chinese Revolution and the achievements of socialist construction, annotating translation strategies and ideological and political key points.

Terminology Database of Chinese Discourse establishes a standardized terminology database for Chinese-specific discourses such as the Belt and Road Initiative, a community with a shared future for mankind, and Chinese-style modernization, ensuring students master standardized translation methods.

The above materials are digitally stored in a unified database, supporting keyword retrieval, parallel display of original texts and translations, and annotation of difficult points. Teachers can embed ideological and political materials into course teaching, and corporate projects should also include assessment requirements for ideological and political elements.

4.2.2. Digitalization of Corporate Translation Projects

Corporate translation projects reflect the "industry" dimension [7] and serve as the core resource for students to gain authentic practical experience. The construction path consists of the following four steps.

Step 1: Project Collection and Desensitization Processing. The university signs agreements with partner enterprises, and it collects real corporate translation projects (such as product manuals, contract documents, promotional materials, technical documentation, etc.) from these enterprises. The enterprises perform commercial desensitization processing, and they ensure that no confidential information is involved before the enterprises upload the projects to the platform.

Step 2: Project Grading and Labeling. The platform labels the projects according to text type, professional field, and difficulty coefficient, and it forms a three-level project library of "Beginner-

Intermediate-Advanced.” Beginner-level projects are suitable for first-year students to practice, and advanced-level projects are used for comprehensive training before graduation. Table 2 shows the grading standards for corporate translation projects.

Table 2: Grading Standards for Corporate Translation Projects.

Level	Text Type	Professional Field	Word Count	Completion Time	Applicable Grade
Beginner	Daily correspondence, simple instructions	General field, Tourism	500-1000	3-5 days	First semester of the first year of graduate studies
Intermediate	Product manuals, news reports	Technology, Business, Education	1000-2000	5-7 days	Second semester of the first year of graduate studies
Advanced	Contract documents, academic papers	Law, Medicine, Finance	2000-3000	7-10 days	Second year of graduate studies

Step 3: Project Supporting Resources. The platform attaches supporting resources to each project, including project background descriptions, client requirements, style guides, reference terminology tables, and other authentic work documents. These resources help teachers restore real professional scenarios.

Step 4: Project Update Mechanism. The enterprises provide no fewer than 5 new projects per semester, and the platform eliminates outdated projects. This mechanism maintains the timeliness of the case library.

4.2.3. Virtual Simulation Translation Environment

For translation scenarios that are difficult to achieve in traditional teaching (such as international conference simultaneous interpretation, court translation, and medical interpreting), the system can utilize virtual reality (VR) or simulation software to develop immersive training environments. Students wear VR devices to enter virtual scenarios, and they play the role of translators to complete translation tasks. The system automatically records their performance, and it generates analysis reports.

4.3. Big Data Analytics and Personalized Learning

Big data analytics serves as the “intelligent engine” of the digitalized training system. The system achieves personalized learning path recommendations and precise teaching interventions through the in-depth mining of students’ learning behavior data [9][10].

4.3.1. Data Collection Dimensions

The platform comprehensively collects multimodal data during students’ learning processes, and system operators use these data to form personal learning portfolios. Table 3 shows the platform’s data collection dimensions and their corresponding uses.

Table 3: Platform Data Collection Dimensions and Uses.

Data Category	Specific Indicators	Collection Method	Main Uses
Basic Information	Grade, specialization, entrance scores	Import/Entry	Stratified analysis, control group setting
Learning Behavior	Login frequency, learning duration, video progress	Log recording	Learning engagement assessment, early warning
Practice Data	Translation speed, error type distribution, revision frequency	Assignment system	Competency profiling, weakness diagnosis
Interaction Data	Number of posts, peer review participation, collaboration frequency	Community logging	Collaboration ability assessment
Project Data	Number of projects claimed, completion quality, corporate ratings	Project system	Practice ability evaluation, employment recommendation

4.3.2. Learner Profile Construction

Based on the collected multidimensional data, the system uses algorithms such as cluster analysis and

factor analysis to construct a dynamic “competency profile” for each student [11]. The profile includes three dimensions. The language competence dimension encompasses bilingual foundation, grammatical accuracy, and vocabulary richness. The translation skill dimension encompasses translation strategy application, terminology processing ability, and register control. The professional literacy dimension encompasses project completion efficiency, team collaboration performance, and tool proficiency. The system presents the profile in the form of a radar chart, and it intuitively displays each student’s strengths and weaknesses. The system also supports horizontal comparison (comparing with class averages) and vertical tracking (individual development trajectories).

4.3.3. Personalized Learning Recommendations

Based on the learner profiles, the system adopts a recommendation algorithm that combines collaborative filtering and knowledge graphs, and it provides students with personalized learning support. First, the system recommends learning content. It recommends targeted micro-lecture videos, practice questions, or ideological and political reading materials based on students’ weak areas. Second, the system recommends translation projects. It recommends new projects with appropriate difficulty levels and matching fields based on the types and quality of projects that students have already completed. Third, the system plans learning paths. It generates phased learning plans based on students’ long-term development goals (such as passing CATTI Level 2 or entering a specific industry).

4.3.4. Intelligent Assessment and Immediate Feedback

Traditional translation teaching suffers from long feedback cycles and limited information content in assignment feedback. The big data-driven intelligent assessment system can achieve immediate and multidimensional feedback [12]. The system automatically scores objective question types (such as terminology translation and grammar correction), and it marks the locations of errors. The system calculates the distribution of error types in students’ assignments (such as part-of-speech misuse, collocation errors, and word order errors), and it generates personal error heat maps. Based on historical learning data, the system predicts students’ performance ranges in a certain examination or project, and it provides early warnings of learning difficulties. Teachers and corporate mentors can view overall class data through the system backend (such as high-frequency error rankings and project completion progress statistics), and they can adjust teaching priorities or supplement specific cases accordingly.

5. Conclusion

This study addresses the practical needs of Master of Translation and Interpreting (MTI) education reform. It focuses on the prominent problems in the current training model, including the disconnect between political literacy and professional competence, the insufficient depth of industry-education integration, and the lagging level of digitalization. The study constructs a digitalized training system for MTI students from the perspective of “government-industry-education integration.” The main conclusions of this study are as follows.

First, government-industry-education integration represents an inevitable choice for MTI education reform. The government, industry, and educational institutions each have irreplaceable functional roles in translation talent cultivation. The government controls political direction and quality standards. The industry provides authentic scenarios and competence benchmarks. The educational institution integrates resources and implements systematic teaching. The tripartite synergy forms a closed-loop logic of “objectives-resources-process-evaluation,” and this synergy serves as the theoretical prerequisite for constructing a digitalized training system.

Second, the digitalized training system should comprise four core modules. The online learning and practice platform serves as the technical foundation, and it enables multi-role access and full-process coverage. The digital resource repository integrates ideological and political translation materials and authentic corporate projects, and it acts as a concrete carrier of government-industry-education integration. The big data analytics and personalized learning system achieves individualized instruction through learner profiles and intelligent recommendations. The social learning and team collaboration mechanism cultivates students’ project management and collaboration abilities. These four modules support each other and share data, and they constitute a dynamically optimized training ecosystem.

Third, the system construction should follow five basic principles. The synergy principle serves as the core, and it ensures that the three parties share consistent objectives. The technology empowerment principle serves as the means, and it enables systematic reconstruction. The operability principle serves as the guarantee, and it balances resource constraints with reform visions. The learner-centered principle

serves as the value orientation, and it serves students' personalized development. The continuous improvement principle serves as the driving mechanism, and it promotes iterative upgrades of the system.

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