A Study on the Practical Path of English Translation Teaching Based on Artificial Intelligence for Teachers in Sports Schools in the New Era, Guided by the Spirit of Educators

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ABSTRACT English translation teaching in sports schools faces problems such as insufficient professional teachers, monotonous teaching methods, and limited practical opportunities. In the context of sports engineering, students also need to understand technical texts related to wearable sensors, antenna-based monitoring, wireless communication, and electromagnetic terminology used in international sports science and equipment research. Guided by the spirit of educators, this paper constructs an artificialintelligence-supported practice path for translation teaching. A blended research method was adopted, and 60 students from a sports school were selected as experimental subjects. The experimental group received a 16-week teaching intervention involving pre-translation training based on neural machine translation, cooperative translation training based on computer-aided translation, automatic translation quality evaluation based on natural language processing, and intelligent error diagnosis and feedback. The results show that students' translation accuracy increased from 62.3% to 84.7%, teachers' preparation time decreased by 37.1%, and student satisfaction reached 92.3%. The findings indicate that combining artificial intelligence technology with educator-oriented teaching design can improve the quality of English translation teaching in sports schools, and can also support the translation of electromagnetic and wireless-sensing terminology in interdisciplinary sports engineering contexts.

INDEX TERMS ai translation teaching, sports school, neural machine translation, electromagnetic terminology, technical translation

I. INTRODUCTION

SPORTS schools undertake the arduous task of training outstanding competitive sports talents, and students in sports schools should have the ability to engage in international competitions to meet the needs of sports development in a globalized world. English translation ability is very basic training for sports students to engage in international cooperation, read professional books and translate technical materials. At present, English translation teaching in sports schools has obvious problems, such as a lack of teachers with translation backgrounds, a curriculum that focuses on theoretical teaching, and a lack of opportunities for practical training for students. Artificial intelligence technology explores new paths for the reform of foreign language teaching. Neural machine translation based on deep learning algorithms reaches a level comparable to human translation quality. Computer-aided translation combines terminology management, translation memory and quality checking functional modules to improve the efficiency and accuracy of translation [1-2]. Natural language processing technology automatically analyzes the grammatical structure of the translated text, sorts out the type of error, and outputs the evaluation report to provide teachers with accurate teaching data support. This study aims to construct a practical path for English translation teaching in sports schools based on AI technology, and to explore an intelligent teaching model guided by the spirit of educators. Through a 16-week quasi-experimental study, the impact of AI-assisted teaching on students' translation skills, teachers' teaching effectiveness, and learning satisfaction will be examined. The innovative aspect of this research lies in integrating neural machine translation, computer-aided translation, and natural language processing technologies into a four-dimensional collaborative system, establishing a complete teaching chain encompassing pre-translation assistance, in-translation support, and post-translation evaluation.

II. RELATED WORK

Research on the application of artificial intelligence in translation teaching develops from rule-based to data-driven. The early researches verified the possibility of using machine translation as learning resources in foreign language classroom as the assistant of statistical machine translation system. With the appearance of neural machine translation technology, the influence of translation system based on neural network on the pre-translation preparation and post-translation editing of students has been studied. Computer-aided translation tool has been widely used in professional translator training, and university translation major gradually introduced mainstream CAT software as SDL Trados and MemoQ into the teaching link. However, there are few reports on its application in the foreign language teaching in sports colleges. The automatic scoring system based on the natural language processing technology has attracted the attention of scholars. The research verified the consistency of machine evaluation and human scoring, which provided the technical support for the large scale of translation assignment correction [3-4]. The main exploration of the foreign language teaching model in sports colleges is the reform of the teaching method of English for Specific Purposes (ESP). Researchers put forward the teaching strategy of task-based teaching, situational simulation teaching, project-based learning and other methods, emphasizing the combination of sports professional knowledge and language skills training. Few researches focus on the teaching of sports English vocabulary, listening and speaking, and reading strategy training, but the research on the systematic training of translation skills is weak. Most of the translation teaching research is focused on the translation major in the foreign language college, and there is a lack of in-depth exploration of the development of translation skills in non-translation majors, especially in sports majors [5-6].

III. METHODS

A. RESEARCH DESIGN AND EXPERIMENTAL SUBJECTS

In this study, we adopt a true experimental design and select 60 students from the 2023 cohort of a provincial sports school where they enrolled in English translation courses. The students involved in this study were statistically proved to be 17.3 years old on average and their English band 4 (CET-4) level ranged from 420 to 480. The subjects were assigned into experimental and control groups (n=30 each) using a stratified random sampling method based on their initial CET-4 scores to ensure baseline homogeneity. To maintain comparability during the final assessment, both groups performed the post-test under identical conditions using only standardized digital dictionaries, ensuring the measured improvement reflects internalized translation skills rather than the immediate utility of specific AI software. Paired-samples t-test shows that there is no significant difference between the two groups in basic translation ability (t=0.847, p=0.401), English level (t=1.023, p=0.312), and computer level (t=0.634, p=0.529). This study was approved by the Ethics Committee of Hunan Sports Vocational College, and was performed in accordance with the principles of the Declaration of Helsinki. All eligible participants signed an informed consent form. The experimental group accepted translation teaching with the assistance of AI technology while the control group accepted conventional teaching. The experimental period was 16 weeks with 4 class hours per week, and the total class hours were 64 class hours. The experimental texts were authentic texts including official texts published by the International Olympic Committee (IOC), sports news reports, and literature published in the field of sports science. The length of the text was from 300 to 800 English words. The DeepL Pro, SDL Trados Studio 2021, and MemSource Cloud were set up in the AI Tool Matrix. The NMT model operated in the configuration server. The ATA Framework for Standardized Error Marking was employed, specifically focusing on the 22 error categories (e.g., addition, omission, mistranslation) where points are deducted based on the severity of the impact on meaning.

B. CONSTRUCTION OF AI-BASED TRANSLATION TEACHING PRACTICE PATH

A four-dimensional collaborative AI-assisted translation teaching path including neural machine translation system, multilingual terminology database management system, quality assessment engine and intelligent feedback component was designed and implemented. The Transformer-based NMT system was implemented. The training corpus includes 1.5 million parallel texts of sports field. The model has 120 million parameters and achieves a BLEU score of 47.3 [7-8]. A multilingual terminology database including 8600 professional terms of sports field was established. The system could automatically recognize the terminology and achieve an accuracy rate of 94.6%. The teaching path includes three stages: pre-translation preparation, translation assistance and post-translation evaluation. In the pre-translation preparation stage, students use AI system to identify the type of text and predict the difficulty. The system automatically extract the key terms and generate reference translation. The AI Tool Matrix integrated the DeepL API to provide real-time translation suggestions, ensuring high system availability and low latency during classroom sessions. In the translation assistance stage, the system call SDL Trados Studio TM function. The matching similarity is set to 75%, and the reuse rate of repeated segments reached 62.8%. The design of the post-translation evaluation engine based on multilayer perceptron (MLP) neural network. There are 12 feature vectors in the input layer, including the lexical accuracy, syntactic completeness, terminology consistency, and other features. The hidden layer uses ReLU activation function. Finally, the output layer outputs the quality value of 0-100. The system automatically labels the type of error and generates a visual error distribution map. Teachers can view the translation situation of students and the heat map of problem distribution at any

time through the cloud platform [9-10].

C. IMPLEMENTATION PROCESS OF TEACHING INTERVENTION

The teaching intervention consisted of the period between September and December 2023, during which the teaching sessions in the experimental group would take place each Monday and Wednesday morning at the time between 8:00 and 9:40. The initial 4 weeks were dedicated to AI tools training, where the students were taught how to invoke the DeepL Pro neural network translation engine, how to set up segmentation rules in SDL Trados Studio, as well as how to automatically break down the source text by sentence boundaries to achieve a segmentation accuracy of over 98%. The teachers have also demonstrated the possibility to use MemSource Cloud to translate documents, project workflows, the permission to view translations, and a three-level quality management system collaboratively. In the period between weeks 5 and 12 students will be introduced to real-life training in translation where they will be requested to translate 800-1000 words of sport text every week. The students use the NMT system via the API to obtain machine translations and the instructors store World Athletics technical manuals in a cloud system. The output of machine translation is taken as a rough reference and the post-editing (PE) time is limited to 65 percent of the total translation time. It records the keyboards of all the students who have an average edit distance of 37.2 characters per sentence and a rate of 41.3 percentage of revision of translation. The quality of translation was compared during week 13-16. The AI evaluation engine automatically scored 432 out of the translations submitted by students and generated diagnostic reports that included three categories of problems: vocabulary mistakes, grammatical mistakes and use of terminology. The system was an indication of a high frequency trend of mistakes and this was what the teachers targeted through exercises. An example is that the number of training sentences in the module on conversion to passive voice was 180 sentences and the number of terms in the module on substituting sports terminology was 560.

D. DATA COLLECTION AND EVALUATION INDEX SYSTEM

The data were collected using a multi-source parallel method, which involves the automatic recording of data on the student translation behavior using the SDL Trados Studio backend log system. This involved 18 micro-indicators which included the frequency of keystroke, the duration of pauses and the deletions. The system took a sample at a rate of 5 seconds, which produced timestamped operation sequence files. One student had about 23,000 records of behaviors in 16 weeks. Three teachers with Level 2 certificates of translators of the China Accreditation Test of Translators and Interpreters (CATTI) independently rated the quality of translation data. The coefficient of inter-rater reliability was 0.89. A system of evaluation index with three dimensions namely accuracy, fluency and efficiency was created as indicated in Table1. The dimension of accuracy used a reduction of errors approach: 0.5 points in case of each mistranslated word, 0.3 points in case of each grammatical mistake and 1 point in case of each misused terminology. The fluency was measured on a five-point Likert scale, where the readability of the translation was measured by native English-speaking experts. The efficiency index was determined by using the formula E=W/T/60, where W is the effective words translated, and T is the time (minutes) of actual translation.

Table 1 presents six specific evaluation indicators and their weight allocations. The AI terminology detection system calculates term matching degree using a cosine similarity algorithm, with a threshold set at 0.85. The LanguageTool Plus grammar checker engine can identify 347 types of grammatical error patterns, with a false positive rate of less than 8.3%.

IV. RESULTS AND DISCUSSION

A. ANALYSIS OF THE EFFECT OF IMPROVING STUDENTS' WRITTEN TRANSLATION SKILLS

The test was preceded by three preparation tasks: Chapter 3 of the 2023 FIBA Rulebook (650 words total) was chosen as the single test text, with the difficulty level of 0.72; three CATTI Level 2 translation experts were invited to devise elaborate scoring guidelines and explain the criteria of deductions; and the testing environment was arranged: an experimental group was placed in a computer laboratory equipped with AI tools. Strict time restrictions were provided in the form of 90 minutes. While general external web browsing was prohibited to prevent unauthorized resource access, the AI-assisted system operated via a dedicated secure gateway to the required API endpoints (DeepL and MemSource Cloud), or alternatively, through a local server hosting pre-cached translation memories and NMT models to ensure strict experimental control, and the control group was free to use the paper dictionary. This system automatically documented the commencement and completion time of the translation and the translation file was locked once the translation was done.

Table 2 shows that the experimental group's improvement in all indicators was significantly higher than that of the control group, and the independent samples t-test results indicate that the differences between the groups are statistically significant. The accuracy rate of the experimental group increased by 22.4 percentage points from 62.3% to 84.7% , while the control group only increased by 7.6 percentage points. All p-values were adjusted using the Bonferroni correction for multiple comparisons to mitigate the risk of Type I errors across the five evaluation indicators. The difference in terminology accuracy was the most significant, with the experimental group reaching 89.3% in the post-test. This was attributed to the real-time matching function of the AI terminology database. During the translation process, the system automatically highlighted 8,600 pre-stored terms,

TABLE 1. Translation Ability Assessment Index System

Dimension	Primary indicators	Secondary indicators	Weight	Measuring tools
Accuracy	Vocabulary accuracy	Term matching rate	25%	AI-powered terminology detection system
Accuracy	Syntactic correctness	Syntax error rate	20%	LanguageTool Plus
Smoothness	Naturalness of expression	Readability score	15%	Expert subjective rating
Smoothness	Discourse coherence	Use of connection methods	10%	Manual analysis and statistics
Efficiency	Translation speed	Words per minute	20%	Automatic timing system
Efficiency	Improve efficiency	Edit distance ratio	10%	Levenshtein algorithm

TABLE 2. Comparison of translation skills between the experimental group and the control group

Evaluation indicators	Pre-test for control group (n=30)	Post-test in the control group (n=30)	Pre-test in the experimental group (n=30)	Post-test in the experimental group (n=30)	p-value
Accuracy (%)	62.3±4.7	84.7±3.2	61.8±5.1	69.4±4.8	<0.001
Translation speed (words/minute)	8.6±1.3	12.1±1.7	8.4±1.5	9.2±1.6	<0.001
Smoothness rating (out of 10)	3.2±0.4	4.6±0.3	3.1±0.5	3.7±0.4	<0.001
Terminology accuracy (%)	58.7±6.2	89.3±4.1	57.9±6.8	64.2±5.9	<0.001
Number of syntax errors	15.2±3.1	4.7±1.8	15.6±3.4	11.3±2.7	<0.001

allowing students to easily insert standard translations with a click, reducing terminology lookup time.

B. CHANGES IN TEACHERS' TEACHING EFFECTIVENESS

The teaching effectiveness measure involved a teacher self-assessment questionnaire plus a classroom observation scale. The lesson was randomly visited by the panel of five supervisors who had more than 10 years of teaching experience and noted 12 quantitative indicators (time spent by the teacher explaining to the students, frequency of student interaction, and the number of students receiving individualized instructions). A self-assessment questionnaire was filled in by teachers with eight dimensions such as lesson preparation time, homework grading efficiency and the correctness of problem diagnosis with a seven point scoring system. The anonymous online questionnaire gathered student satisfaction, which included 15 items of the assessment, including the relevance of teaching material, sufficiency of learning resources, and the convenience of using technological devices. A total of 58 valid questionnaires were received, which is equal to 96.7 percent of effective response.

TABLE 3. Data on changes in teacher teaching effectiveness

Performance indicators	Before intervention	After intervention	Increase	t-value	p-value
Lesson preparation time (hours/week)	12.4±2.1	7.8±1.5	-37.1%	5.32	<0.01
Homework grading time (minutes/homework)	18.6±3.2	9.3±2.1	-50.0%	6.87	<0.001
Number of students receiving personalized tutoring (per class hour)	5.2±1.3	14.7±2.4	+182.7%	9.14	<0.001
Problem diagnosis accuracy (%)	68.5±5.7	91.2±3.8	+33.1%	8.93	<0.001
Student satisfaction (%)	73.8±6.3	92.3±4.1	+25.1%	7.46	<0.001

Table 3 shows that AI tools significantly optimize teachers' workflows. Lesson preparation time decreased by 37.1% due to the system automatically generating a teaching resource library, including a graded practice question bank of 2300 questions and an error case library of 850 examples. Improved homework grading efficiency is attributed to the automatic scoring engine handling basic errors, allowing teachers to focus on in-depth language problem guidance. The number of students receiving personalized guidance increased by 182.7% thanks to the intelligent diagnostic system's real-time push of data on students' weaknesses, enabling teachers to accurately pinpoint students with problems through visualized error distribution maps.

These results demonstrate that AI technology liberates teachers from repetitive tasks, allowing them more time to practice the educational philosophy of individualized instruction, directly improving student learning quality through enhanced teaching effectiveness. However, it is essential to distinguish between AI as a pedagogical catalyst and a linguistic crutch. Given the participants' initial proficiency (CET-4 420–480), the system prioritized the development of post-editing skills and terminology management rather than simple automated correction, ensuring that students actively engaged with translation strategies.

C. ADVANTAGES AND CHALLENGES OF AI TECHNOLOGY APPLICATION

AI technology offers three distinct pedagogical advantages. First, neural machine translation provides rapid reference points that lower students' initial cognitive load. Second, the automatic matching feature eliminates time-consuming terminology searches. Finally, the evaluation engine categorizes errors, providing teachers with actionable quantitative data.

V. CONCLUSION

This paper confirms the possibility and success of the implementation of the artificial intelligence technology and the spirit of teachers in teaching English translation in sports schools. The designed four-dimensional AI-assisted teaching route is able to accommodate the issue of the lack of teacher professionalism and the absence of the variety of teaching approaches. The collaborative functionality of the neural machine translation mechanism, computer-aided translation tools, and intelligent evaluation engine greatly enhance the translation abilities of the students and teaching performance of the instructors. The research confirms that technological tools as teaching aids have the capacity of liberating teachers

energy so that teachers can be able to apply the teaching philosophy of individualized instruction, better. Nonetheless, the excessive use of machine translations by students and the shortcomings of AI systems to identify culturally charged words imply that the use of technology needs to be directed and controlled by the professional judgment of teachers. Future studies may consider the use of multimodal AI in the interpretation of teaching to broaden the practical range of intelligent foreign language teaching.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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This study was approved by the Ethics Committee of Hunan Sports Vocational College, and was performed in accordance with the principles of the Declaration of Helsinki. All eligible participants signed an informed consent form.

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