Research on AI-Empowered Reform of College Foreign Language Teaching Based on the POA Theory

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Abstract: *For years, China's college foreign language teaching has suffered from the pain point of being time-consuming and inefficient; lots of language input but poor output ability among students. The Production-Oriented Approach (POA) can effectively solve the pain point of separation between learning and use in foreign language teaching. Large-class teaching has many problems like lacking individualized guidance and difficult to implement process-oriented teaching. With the popularization of AI technology, we find a new way to break through the bottleneck. Most academic studies do separate POA teaching practice or AI-based foreign language teaching applications now, which lacks systematic research about their integration. Based on this, we combine the theoretical connotation of POA with the advantage of AI teaching applications, build up a full-process AI-empowered college foreign language teaching model, test its effectiveness via teaching experiment, providing theoretical reference and practical implication for digital reform of college foreign language teaching.*

Keywords: *Production-Oriented Approach (POA); artificial intelligence (AI); college foreign language teaching; teaching reform*

1. Introduction

The digital transformation gives rise to new innovations constantly to college foreign language teaching. Traditional foreign language teaching mainly relies on teacher's lecturing, which has prominent problems such as lack of student's language output and separate learning from use; evaluation for course heavily relies on summative examinations that can't reflect students' dynamic learning process well; homogeneous large class teaching cannot satisfy students' difference in foundation and individualized learning needs resulting in a weak comprehensive language application ability among students. This dilemma of foreign language teaching being "time-consuming and inefficient" lasts for a long period of time.

Production-Oriented Approach (POA) proposed by Professor Wen Qiufang is a localized foreign language teaching theory with focus on learning-centeredness, integration of learning and use and whole-person education; have three-dimensional teaching stages: motivate, enable and assess, organic connection of language input and output, solve the hard problem of separation between learning and use in traditional teaching well, conform to the educational goal of college foreign language teaching. Implementation of POA demands great demand for teacher's ability in instructional design, differentiated guidance, tracking of learning conditions. Public foreign language courses in colleges and universities are mostly taught in large classes, teachers lack teaching energy, they can't supervise whole process and correct individual student's language output error, which greatly limits their classroom application effect and promotion value of POA.

Research on POA at present is currently in the phase of classroom empirical research but most of the AI foreign language teaching research focuses on tools. Our study tries to integrate AI technology with POA theory to build a AI empowered POA teaching model that will provide new ideas and new path for the college foreign language teaching reform.

2. Core Concepts and Related Research

2.1 Core Concepts

2.1.1 AI Technology

The AI technology employed by this paper contains many technologies such as machine learning, natural language processing, and learning analytics. The embodiment of AI in teaching is an intelligent teaching system that collects learning behaviors, identifies weak points in knowledge, provides personalized resources and feedback. Teaching with AI will be a helper for teachers who can deal with standard and repetitive tasks quickly but not able to substitute teachers' in-depth interpretation of texts, guidance on cross-cultural communication or emotional care.

2.1.2 Production-Oriented Approach

The three main principles in POA include the "Learning-Centered Principle", the "Learning-Using Integrated Principle" and the "Whole-Person Education Principle". Its teaching process includes three stages that motivate, enable and assess. In the motivating stage it sets challenging productive tasks to stimulate their learning needs; in the enabling stage it supplies input materials about this task and arranges for language production practice; in the assessing stage it conducts several rounds of assessments on the output outcomes. POA tightly connects input learning and output practice by arranging all teaching activities based on productive tasks, fitting well with the goal of college foreign language courses, emphasizing language use.

2.2 Current Status of Related Research

Domestic POA research matures. Subject search on CNKI for "POA", "foreign language teaching". We acquired a total number of 1,216 relevant articles. Content involves classroom teaching practice, integrating ideology and political education into courses as well as effect verification under different foreign language course scenarios from early stage of introducing and interpreting concepts theory to empirically testing in frontline classrooms. Fewer specialized studies focused on empowering the Production-Oriented Approach by using digital technology addressing difficulty in teaching implementation. Research on AI in foreign language teaching starts rather late. Only 148 related valid articles can be found on CNKI. At present, there are only about 20 studies that integrate AI with the Production-Oriented Approach which shows an obvious problem of fragmentation. Two kinds of research is conducted separately without enough cross-integration; Most studies still exist at the level of theorizing model conception, lacking practical exploration and effect analysis of routine classroom implementation.

2.3 Research Value

Theoretically: It deeply integrates AI technology into Production-Oriented teaching theory; enriches the research system of digital application of the Production-Oriented Approach; provides a new theoretical case and research perspective for AI technology empowering subject teaching. Practically: Based on real college foreign language classroom, we build up a practicable and replicable AI-empowered POA teaching model. Summarize instructional design methods and intelligent tool application strategies that can be used directly as teaching reference by frontline foreign language teachers and achieve the digitalized and precision-oriented reform of college foreign language teaching.

3. Construction of an AI-Empowered POA Teaching Model

3.1 Construction Principles

The integration of the features of college foreign language teaching and the concept of the Production-Oriented Approach, this paper proposes four principles as follows: first, goal-oriented. Focus on improving students' language production ability, solve the difficult problem of separation between learning and use instead of formalistic technological display; secondly, teacher-led. Organize the instruction design, classroom organization and education guidance through teachers, digital tools just help organize data, correct errors at basics or distribute materials so that they achieve human-machine cooperation but not replace teachers by technology; thirdly, based on learning situation data. Through the integration of students' learning process, practice results and assessment information we

can grasp their learning status for guiding teaching adjustment and differentiation; fourthly, gradual and orderly. According to the digital application level of both teachers and students, choose the mature and easy-to-use tools gradually carrying out teaching pilots and steady advancing teaching reform.

3.2 AI Embedded in the Three Major Teaching Stages

3.2.1 Motivating Stage

Learning Situation Analysis and Rational Designing Productive Tasks In this stage we do a learning situation analysis and rational design of productive tasks. Relying only on examination scores and their own experience, teachers judge students' learning situations in traditional classrooms; so they can't know the real ability of every single student. Teachers will conduct pre-tests before unit teaching starts according to the result of the learning situation. Based on students' professional background and learning interest, teachers will design productive tasks with appropriate difficulty which is close to daily life and professional scenario, stimulating students' learning enthusiasm and improving the previous problem of monotonous task design and lack of target.

3.2.2 Enabling Stage

We provide tiered learning materials in this phase that support language production practices. It's hard in large class teaching to cater to all students' needs because some can't keep up whereas others don't have any space for extension. According to our previous learning situation analysis, teachers match different learning materials to students; those with a weak foundation consolidate their vocabulary and grammar whilst those with a better foundation get supplementary extended reading and authentic language materials which alleviate the problem of imbalanced learning needs. Students can autonomously adjust themselves after finishing speaking and writing exercises by referring to the revision suggestions for basic problems. Teachers no longer spend much effort correcting basic errors but guide them at higher order level like content logic and communicative strategies.

3.2.3 Assessing Stage

Step 1: Multiple Assessments to Promote Whole-process Education Due to limited class hours, it's hard for traditional classes to conduct a complete process-based assessment. We use "basic assessment + teacher re-assessment", aiming at achieving an efficient yet high-quality assessment. Basic indicators like speaking fluency, grammatical accuracy and lexical richness are verified firstly while deeper content (task fit, textual logic and cross-cultural expression) is assessed by teachers. Meanwhile, we keep learning records including practice frequency, learning duration and ability changes which enables teachers to be up-to-date with students' learning dynamics anytime, timely guide those who lag behind in learning or have low participation, implementing whole-process teaching management.

3.3 Teaching Task Design and Operating Mechanism

The tasks are created according to the production goals forming a closed loop teaching process of scenario creation, task implementation, feedback optimization and multiple assessments. The teachers create graded learning scenarios and tasks according to students' language foundations and disciplinary differences: For students at the basic level, teachers give simple tasks such as daily communication and basic writing; for advanced students, teachers perform comprehensive tasks such as academic exchange and foreign-related communication which makes a task system progressing from the simple to the complex and meeting tiered learning needs. Students correct language problems through teaching feedback when practicing tasks and improving their output results. When they finish the tasks, teachers make comprehensive assessment based on three aspects including language skills, completion quality and learning participation, accurately identify students' strengths and weaknesses in learning, providing basis for individualized development.

To sum up, we have designed an optimized Production-Oriented teaching model with one center (taking improving students' language production ability and practicing the integration of learning and use), three stages (taking the cyclical and iterative stages of motivating, enabling, and assessing) and multidimensional support (learning situation analysis, tiered resources, and multiple assessments). The stages are dynamic cycles empowering each other. According to teaching feedback, continuously optimize instruction design and task assignment so that the whole teaching process is monitorable, adjustable, and constantly improvable, which implements precision-oriented education.

4. Teaching Practice and Effect Analysis

4.1 Experimental Design

In order to verify the practical application effect of the AI-empowered POA teaching model, we chose two parallel first-year classes of the secretarial major from a vocational college (each class has 50 students) who had no significant difference according to their English test scores when enrolled into the school, and they have basically similar learning foundation before the experiment. The class taught by using the AI-empowered Production-Oriented teaching model will be compared against the other one that uses the traditional POA teaching model without AI assistance. Duration of the experiment is set up as 12 weeks with four full College English teaching units. We adopt both quantitative and qualitative method. Quantitative data includes: unit test score, final oral and writing assessment score, and platform learning behavior data; Qualitative data includes: classroom observation record, student interviews content and teachers' teaching reflection log. Tools involved in experiments are: the Zhihuishu learning situation analysis and resource push module, an intelligent essay correction system, and a dedicated oral assessment APP.

4.2 Classroom Implementation Process

During the teaching motivation stage, teachers took unit learning situation diagnostic test via the intelligent platform in advance and accurately grasping students' knowledge weakness according to the learning situation report from the system. By analyzing the learning situation data of taking the teaching unit on foreign-related legal affairs for example, we find that there is a poor reserve of specialized legal English vocabulary among students so as to adjust the relatively difficult simulated foreign-related oral negotiation task into a moderately difficult foreign-related legal correspondence writing task to lower the threshold difficulty while keeping the core purpose of language production training.

We enabled students with different language productions during the helping process from the intelligent platform: automatic finding out grammar mistakes, vocabulary misuse and structure issues in texts when they write essays, giving revision suggestions so as to let them polish their texts themselves and repeatedly optimize their content; focused classroom instruction based on the common error problems of the class calculated by the platform; manual review and guidance for individualized problems which AI cannot detect (content innovation, logical gaps or stiff expression) were done by teachers.

Assessment of stage in teaching: The intelligent platform will generate an individual report on the student's learning when finished the teaching of every unit; record such as students' knowledge mastery, extracurricular learning duration, task completion quality, degree of ability improvement etc.; Teachers integrated the data given by the platform combined with observation of students' classroom performance to conduct comprehensive assessment feedback and give one-on-one improvement suggestions for students' weak areas so that they can achieve precision-oriented education.

4.3 Practical Effects and Discussion

After a one-semester teaching experiment, this study drew four core research conclusions through data comparison and interview analysis.

Firstly, students' basic language production ability has been greatly improved. Overall final oral and writing scores of the experimental class is better than that of the control class which made great progress on speaking fluency, grammatical accuracy, and lexical accuracy and appropriateness because of the advantage of immediate error correction and repeated practice with digital teaching. No significant difference was found for both classes about their higher order abilities (logical structure, content depth, cross-cultural expression), implying that digital means can only optimize basic abilities from the aspect of language form but it still depends on teachers leading in-depth teaching if we want to improve students' higher-order competences like critical thinking and creation.

Secondly, the initiative of student's autonomous learning is well improved. There are significant increases on frequency of extracurricular practice and autonomous learning time in the experimental class. Immediate learning feedback compensates for shortcomings of delayed error correction and lack of feedback in traditional after-class practice; it enables students to promptly correct problems and repeatedly consolidate practice easily. This type of feedback model is very rigid: it can only mark error

types without explaining causes nor giving optimization guidance; its education targeting is limited too.

Thirdly, Optimization of Teachers' teaching work: Sharing digital teaching repetitive works (basic error correction, routine grading and learning situation statistics) reduced teachers' mechanical workload so they can focus their attention on core links of instructional design, higher-order guidance and individualized education. But the new teaching model demanded greater demands in teachers' teaching competence; preparation work for curriculum design and teaching adaptation increased.

Fourthly, There are significant differences between the teaching benefits of students at different levels. The most improved was the intermediate level: Individualized learning support makes up for the lack of sufficient individual guidance in large-class teaching and quickly consolidates their language foundation and production ability. For those with a weak foundation, they find it hard to fully absorb the content of digital feedback, which requires specific tutoring by teachers; high-level students feel that current learning resources are not deep enough to satisfy their need for further improvement. We see that digital teaching cannot eliminate the difference among students, and teachers' tiered precision teaching still plays an irreplaceable core role.

5. Implementation Challenges and Optimization Strategies

5.1 Insufficient Alignment Between Teaching Tools and the POA Process

The existing foreign language teaching tools do not follow the teaching logic of the POA with low alignment in each teaching stage. The alternating between various platforms for both teaching and fragmented data would add burden on teachers without improving teaching effectiveness. Colleges and universities should choose teaching platforms which are data-interoperable and functionally compatible so that teachers can leverage the strengths of different tools to construct an appropriate teaching system based upon the POA and compensate the shortcoming of functionality from one tool.

5.2 Mismatch Between Teachers' Teaching Competence and Transformation Needs

Digital teaching requires teachers to change from being transmitters of knowledge to instructors designers and guides in student's development; it calls for comprehensive teaching competence. Some teachers can't integrate teaching with technology, they can do only some basic teaching functions but find it difficult to deeply integrate teaching tools with the POA. Colleges and universities should strengthen the specialized training focusing on the integrated instructional design and classroom implementation strategy through teaching and research format like lesson case discussion or collective lesson preparation so that teachers could complete role transformation and improve their teaching practice ability.

5.3 Insufficient Adaptability of Students' Autonomous Learning Ability

Requirement on extracurricular learning model of the POA requires a lot from student's autonomous learning and self-regulating ability. There exists some weaknesses for some students in learning initiative; their task completion is formalistic; they cannot distinguish and use learning resources well which makes it hard to implement deep learning. Standardization of extracurricular learning requirements by teachers, refinement of learning tasks and assessment criteria, guidance to check their own weakness and optimization of learning methods based on teaching feedback will gradually cultivate autonomous learning competence.

6. Conclusion

By applying AI technology, our study showed that we can solve some practical problems in large-class POA teaching (inadequate individualized guidance; difficulties with implementation of process-based assessment and difficulty in achieving tiered teaching), greatly enhancing students' language production ability and their autonomous learning engagement. The limitations of capabilities of AI, which cannot replace teachers in cultivating higher-order thinking, logical reasoning and cross-cultural communicative competence – teachers' core role in education is irreplaceable. The duration of experimentation and the number of samples in our study have limits, whose results need verification via classroom practice at a larger scale. AI is only an effective technical tool for promoting foreign language teaching reform rather than the goal of teaching. Digital reform of college foreign language

teaching shall always take the development of students' comprehensive abilities as its core, empowering technological application based upon teaching theory, avoiding technology abuse and formalistic reform. It will focus on the deep integration between large language models and the Production-Oriented Approach, optimizing the multiple teaching assessment system, constantly upgrading the human-machine collaboration college foreign language education model, providing more practical support for the high-quality development of foreign language teaching.

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