Research Article

A Model for Teaching English Translation in Universities Based on the Random Matrix Optimization Bell Translation Model

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This paper adopts the random matrix optimization fusion of Bell's translation model to conduct in-depth research and analysis on the teaching model of English translation in colleges and universities. Bell's translation model theory explicates the mental model of the translation process to a certain extent based on psycholinguistic research results. Using the results of random matrix theory on the eigenvalues of the sample covariance matrix, the energy of each subspace is estimated, and the estimated energy is then used to construct the subspace-weighting matrix. The statistical properties of the sample covariance matrix eigenvectors were analyzed using the first-order perturbation approximation, and then asymptotic results from random matrix theory on the projection of the sample covariance matrix signal subspaces to the real signal parametrization were used to obtain the weighting matrix based on the random matrix eigenvectors. The analysis shows that the teacher can help students understand the teaching content and master the knowledge points by using guided meta-discoursal to indicate the logical relationships inherent in linguistic expressions and make the discourse transitions natural, coherent, and organized. The use of interactive meta-discoursal attracts students' attention and treats them as participants in the discourse, making them feel a sense of belonging and satisfying their need for psychological belonging, which is beneficial to the students' main position in the classroom. In teaching methods, there is a principle of comprehensible input, which is to provide students with a lot of interesting and understandable listening and reading input. In the translation classroom, the translation teachers code-switched infrequently and mainly used three types of code-switching: inter-sentence code-switching, intra-sentence code-switching, and additional code-switching to carry out translation teaching. Among them, intra-sentence code-switching accounts for 57.46%, inter-sentence code-switching accounts for 41.53%, and the least frequent is additional code-switching, accounting for 1.01%.

1. Introduction

The translation method, also known as the grammar-translation method, is a teaching method in which grammar is taught as the core and translation as the means, and translation is both a teaching means and a teaching purpose. The translation method is the oldest foreign language teaching method, which was originally used in the Middle Ages when Latin was taught in Europe to enable people to read Latin materials and documents. For some time, the translation method was greatly challenged and impacted by the communicative method [1]. However, as the limitations of the communicative approach emerged, such as the lack of a real-life communicative environment and the sacrifice of correctness for communicability, the translation approach gradually returned to the forefront of people's minds. The focus of English teaching in colleges and universities has gradually shifted from general English (EGP) to English for special purposes and academic English, which has become the requirement of the new era. The language skill-oriented (SBI) teaching model is bound to change into a content-oriented teaching mode (CBI), and in this sense, the teaching of English for Special Purposes has become the development direction of English teaching reform in China's colleges and universities [2]. English for Special Purposes can be thought of as an approach to curriculum design and instruction that

targets groups of learners with a common learning goal or purpose. This may be the focus of attention in the field of education. One of the most distinctive features of special-purpose English programs is that they are based on an analysis of learner needs. Given that learners of specialized English may have more focused learning goals and that the course attempts to achieve those goals, it is likely that specialized English courses will last for some time [3]. Typically, such courses are based on an analysis of academic or workplace needs. In this context, research on higher education curriculum and instruction from an academic English perspective should focus more on national realities and localized practices to ensure its effectiveness and relevance.

In practical applications when the number of samples is much larger than the number of array elements, the performance of the traditional method is better [4]. Through independent inquiry, group study, and collaborative study, students can complete the understanding and absorption of the knowledge points of English academic research papers, complete project- and task-based activities, and demonstrate the reading situation in the form of actual combat. In the case where the number of snapshots is comparable to the number of array elements, many statistical inference results obtained according to the traditional asymptotic regime have large errors. When the number of snapshots is much larger than the number of array elements, the sample covariance matrix of zero-mean, unit-variance independent, and identically distributed Gaussian noise output from the array elements converge to the covariance matrix, that is, the unit matrix, with all eigenvalues of 1 [5]. And when the number of snapshots is comparable to the number of array elements, the sample covariance matrix of zero-mean, unit-variance independent, and identically distributed Gaussian noise with eigenvalues converging to law differs from the distribution of eigenvalues obtained by the conventional assumption. In the case of a low signal-to-noise ratio where the number of snapshots is comparable to or even smaller than the number of array elements, the premise that the traditional algorithm relies on the number of snapshots being much larger than the number of array elements no longer holds, resulting in a degradation of the DOA estimation performance.

Through the research literature related to academic English theory, this study found that existing studies have systematically and comprehensively organized academic English theories from different perspectives and combined these theories with the implications of macroparadigm shifts in language teaching, which led to the induction of four literacies in academic English theory, namely, academic literacy, disciplinary cultural literacy, critical literacy, and digital literacy. Academic English as academic literacy, an orientation that focuses on teaching students the necessary English language and study skills to help them complete their academic studies. Academic English as disciplinary cultural literacy, an orientation that focuses on teaching students some common sense and ritual meanings and epistemologies that are validated in a discourse culture to help them learn and socialize daily. This orientation not only

aims to teach students the skills necessary to complete their academic studies but also to help them adapt to the new mediums of scholarship that they may encounter in their future academic careers.

2. Related Works

Some scholars have explored the relationship between the concept of general English and the teaching of English in academic settings, particularly in the teaching of academic English in higher education, arguing that students may be advanced proficient users of general English but lack the English needed to respond to the linguistic demands of their academic studies [6]. Research suggests that general proficiency is a prerequisite for developing academic literacy and professional communication skills because students need to have intermediate to advanced levels of general proficiency [7]. The quality of the course can be guaranteed, especially so that the learners can achieve the expected learning effect. Therefore, a needs analysis must be carried out to collect relevant data on the language needs of learners. In this respect, language development can be viewed as longitudinal. However, a student's ongoing general proficiency development will influence and be influenced by the academic skills they are developing, and in this respect, language development can also be described as horizontal. Indeed, in exploring the target academic contexts in which undergraduates should engage, academic English researchers have focused on both the outcomes and practices of academic research as well as the outcomes and practices of teaching and learning in which students can acquire academic knowledge [8]. A useful starting point for examining the future of higher education is a definition of the discipline that encompasses teaching and learning [9]. To create opportunities for undergraduate students to successfully engage in scholarship, the role of academic English teachers in higher education is to make unfamiliar teaching and learning practices familiar, and to do this, academic English teachers need to draw on others or their research on these teaching practices [10]. Advocate for coherence in constructive, that is, curriculum design, instruction, and assessment aimed at achieving well-chosen learning outcomes, and use this as a guide for academic English curriculum design.

Wang and O'Boyle report on the process of establishing an assessment scale to assess the outcomes of consecutive interpreting among university students, and the research steps are rigorous, and the assessment scale has been adopted by many scholars to assess the grades of consecutive interpreting among university students [11]. Wen et al. review the development and main trends within the field of translation education based on the perspective of being a translation educator over the past three decades and argue that epistemological philosophy of education and the main body of learning theory, can help clarify past pedagogical practices and provide direction in the search for approaches more appropriate to translation education today [12]. From the perspective of practical experience, Liu and Yin point out that translation is a skill, and the translation must be clear,

vivid, and easy to understand [13]. While Jelodar et al. emphasize that translators must understand the original text in the correct way, by which they mean from the original author's point of view rather than from the translator's point of view [14]. He pointed out that linguistic analysis is the basis of translation, wherever people meet the language of others or with the language of their past, they are translating. To translate correctly, one must adopt a critical and analytical attitude toward the methods and means of translation and must analyze the linguistic materials at four levels: grammar, vocabulary, word collocation, and the context of speech use [15]. In other words, linguistic analysis is a prerequisite for translation [16].

This study compares and analyzes the research history of academic English curriculum design at home and abroad in recent years and categorizes and analyzes the research content, research methods, and research perspectives. The results found that, from the perspective of research on academic English and teaching and the level of research, medium, and macrostudies are in the majority, and microstudies often replaced, probably due to the lack of systematic research and other reasons. From the perspective of research methods, discursive theoretical studies still dominate, while basic and thematic studies that have both a specific theoretical perspective and are supported by empirical research still account for a relatively small proportion of them. Since the type of course selected in this study is a translation course, to highlight the teacher's discourse, when analyzing the code-switching, the corpus involving the translated text, such as the teacher's reading of the translation answers, the teacher's repeating the students' translation answers, etc., are excluded from the research materials. In addition, most of the current studies on undergraduate academic English curriculum and teaching remain at the macrolevel of exploration, and although there are some detailed and diverse studies on academic English curriculum and teaching, they are mainly dominated by quantitative paradigms and still lack innovative studies at the microlevel in the natural state. What is more, needed in the development of academic English research so far is a gradual transition from simple theoretical research and macroscopic research to complex applied research, practical research, and microscopic research, which can be organically applied to the practical research of academic English by combining quantitative, qualitative, and mixed empirical research methods, as well as nonempirical research methods such as discursive research and literature research. The lack of the above-mentioned studies and the need for future research is the original intention and direction of the efforts to improve this study and its follow-up studies.

3. Random Matrix Optimization Bell Translation Model Design

A significant part of contemporary translation research is based on cognitive psychology research, and the most typical one is Bell's translation model theory. Bell believes that the translation process is a special case of human information processing phenomenon, which can be described by the psychological information processing theory, and points out that the whole process of translation is mostly carried out in the memory system, as shown in Figure 1.

From this figure, we can see that Bell's model theory of the translation process emphasizes that the translation process is accomplished in the memory system through a chapter-decoding device in the source language and a chapter-encoding device in the target language through semantic representations. The memory system can be divided into long-term memory and working memory, which constitutes an important part of cognitive processing. Working memory, introduced by Baddely, is the temporary storage of information from any domain of cognitive tasks being processed and is then an activated part of long-term memory. Long-term memory is the total store of knowledge in the human brain, all information except that which is processed by working memory [17]. Long-term memory provides the resources for cognitive processing, and working memory provides the means for cognitive processing. After a series of analysis processes such as lexical recognition, syntactic analysis, semantic analysis, and pragmatic analysis, the source language is internalized into a semantic representation that is not constrained by language. After deriving the semantic representation of the source language, the translator enters the synthesis stage through pragmatic synthesis, semantic synthesis, and syntactic synthesis, and expresses the semantic representation of the original language in linguistic form by compiling it in another code. This paper presents a general nonparametric estimator to estimate this implicit distribution function, explores its distribution law, and proves that the estimator is a consistent estimator:

$$X = \sum_{i=1}^{N} \gamma \theta_i \varphi_i. \tag{1}$$

The conjugate backward smoothing algorithm is to smooth the covariance matrix of the backward subarray. The forward-backward smoothing algorithm is based on the forward-smoothing algorithm and the conjugate backward-smoothing algorithm, and its covariance matrix is the summation of the covariance matrix of the forward-smoothing algorithm and the covariance matrix of the conjugate backward-smoothing algorithm to take the average. The spatial smoothing algorithm can effectively handle the coherent signal problem. Another limitation of the algorithm is only applicable to uniformly equidistant line arrays, since the spatial smoothing algorithm needs to divide the subarrays uniformly to make the linear manifold matrices of the subarrays the same, thus completing the process of spatial smoothing:

$$S = \frac{1}{n} \sum_{j=k}^{n} (x_k - \overline{x})(x_k + \overline{x})^*. \tag{2}$$

Let us start with the sample covariance matrix, which is a very important type of random matrix in multivariate
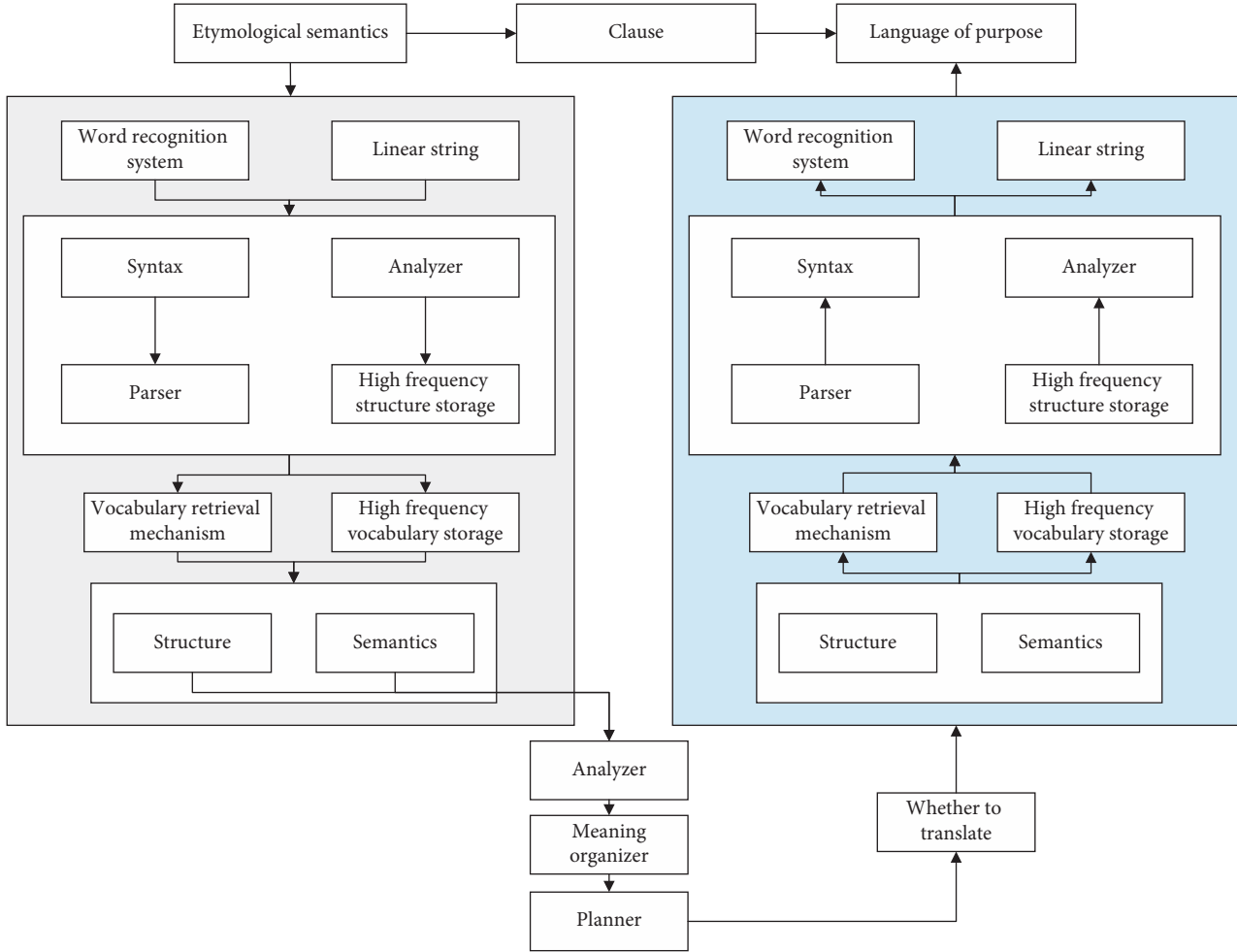
FIGURE 1: Bell translation process model.

statistical inference. It is the basis for hypothesis testing, principal component analysis, factor analysis, and discriminant analysis. Many test statistics are composed of their eigenvalues, such as the likelihood ratio statistic, and John's statistic. However, in most cases of spectral analysis of high-dimensional random matrices, the sample covariance matrix is simply defined as follows:

$$S = \frac{1}{n} XX^*. \tag{3}$$

The Stieltjes transform is similar to the Fourier transform in classical probability theory and signal processing, where the Fourier transform allows for a simpler analysis in the frequency domain than in the time domain. Usually, spectral analysis of large dimensional random matrices is achieved by the Stieltjes transform, where the spectrum is the distribution of the eigenvalues of the matrix. f is the probability density distribution function of a random variable X in the real number domain, then the F Stieltjes transform $S_F(t)$ can be expressed as follows:

$$S_F(t) = \int \frac{1}{t} dF(t^2). \tag{4}$$

However, in practice, this formula is rarely used. For a random matrix X, the eigenvalue distribution of X can be obtained if the Stieltjes transform of X is known, but obtaining the eigenvalue distribution of X in the frequency domain is more difficult to achieve than in the Stieltjes transform domain. Since we have been dealing with matrices of the form $(X - zI_n)^{-1}$, which can also be called decomposable matrices of X, the analysis of random matrices is based on the use of the classical matrix inverse formula.

Bodies construct and extend schemas by testing them against their current knowledge, realigning and extending schemas, and integrating new knowledge into their existing structures to construct knowledge. Much of what we know about problem-solving, constructing knowledge, practice effects, expertise development, and other aspects of foreign language learning is based on the framework of cognitive constructivism. These principles include the importance of a priori knowledge, prior knowledge activation, knowledge elaboration, contextual learning, and knowledge transfer. Despite self-regulated learning of the theoretical diversity, most theoretical models of self-regulated learning share core characteristics. First, most theories of self-regulated learning describe a self-directed feedback loop consisting of multiple

processes and subprocesses. Self-regulated learners use these looping processes to monitor the effectiveness of their activities and to respond to feedback:

$$P = \frac{1}{n} \sum_{j=k}^{n} \theta_i \varphi_i v_{\theta_i}^{\varphi_i}. \tag{5}$$

Academic English programs that are subordinate to specialized English programs are designed to teach the language and communication skills that specific groups of language learners need or will need to function effectively in their disciplines, professions, or workplaces. Because English for Special Purposes focuses on teaching specific language and communication skills, academic English program design typically includes a phase in which the program designer (teacher) identifies what specific language and skills are needed by the language learner population. In the translation class, the presentation questions asked by teachers accounted for 61.50%, and the reference questions accounted for 38.50%. There are far more presentational questions than reference questions, which is related to the nature of the classroom selected in this study. The identification of language and skills is used to identify and refine the content of an academic English course, as shown in Figure 2.

In the early days of the establishment of Specialized English, a needs analysis was often interpreted as a simple preparatory process that included an analysis of the target situation. In this process, the language, and skills that learners will use in their target professional or vocational workplace or their field of study are identified and considered in the light of the current state of learners' knowledge, their understanding of their needs, and the practical possibilities and constraints of the teaching and learning environment. The information gained from this process is used to determine and refine the content and methods of the academic English program.

This study investigates teachers' discourse from the perspectives of language teaching and discourse analysis, based on dialogue theory and conformity theory, and analyzes the communicative meanings and purposes behind different linguistic forms of teachers' discourse (such as teachers' code-switching, teachers' questions, teachers' feedback, teachers' metadiscourse, and other discourses) in English translation classrooms, taking the communicative situation of discourse and the communicative purposes of discourse as the starting point [18]. Therefore, this study analyzes the specific features of teacher questioning discourse and teacher feedback discourse and their pedagogical functions under the guidance of dialogue theory. In addition, the prerequisite for effective discourse output in English translation classrooms is the ability to choose appropriate discourse in response to specific linguistic contexts. Due to the influence of English proficiency test, teachers ignore the extension of students' translation output ability. Therefore, this study adopts the theory of responsiveness to analyze the specific forms and reasons for teachers' code-switching and teachers' meta-discourse as well as their discourse output functions. In summary, this study explores the communicative meaning and purpose of teachers' discourse from the perspective of language teaching and discourse analysis and analyzes the specific forms of teachers' questions, teachers' feedback, code-switching, and meta-discourse and their pedagogical functions using dialogue theory and conformity theory as guides.

4. Design of English Translation Teaching Mode in Colleges and Universities

The first step in the needs analysis is to systematically collect and analyze students' needs through questionnaires and interviews. The needs of learners have been divided into three areas: what students think they need, what knowledge or skills students still lack, and what students need to learn, which may be relevant to the school, future jobs, and national requirements regarding human resources development. The needs of individuals, schools, society, and the state should be considered in a comprehensive analysis of curriculum design. Three important decisions need to be made by teachers around these specific instructional goals and content: the choice of instructional models and methods, the choice of materials, and the choice of evaluation types and methods.

The principles of the abovementioned model indicate that all aspects of curriculum construction must follow the laws of language and teaching. Based on theories and research findings in the field of foreign language teaching and pedagogy, the constructors of the model propose several basic principles related to teaching methods, materials, and tests. Among the teaching methods is the principle of comprehensible input, that is, providing students with plenty of interesting and comprehensible listening and reading input. In short, classroom practice should be closely integrated with theoretical research. This combination can help teachers achieve the best teaching results.

The outermost layer of the course evaluation model is evaluation, which collects, synthesizes, and analyzes all information related to the evaluation of course quality, including student test scores, attendance rates, student satisfaction surveys, and teacher satisfaction surveys [19]. The goal is to continuously improve the quality and effectiveness of the course. This may be the focus of attention in the field of education. One of the most striking features of English for Specific Purposes courses is that they are based on an analysis of the learner's needs. It should be emphasized that this evaluation process involves every aspect of the course design, and each aspect is in a cycle from planning, implementation, evaluation, and revision to reimplementation reevaluation, and revision. In short, in this model, curriculum development is not an end product, but a dynamic process that is constantly adapting to new situations and changes, as shown in Figure 3.

Therefore, this class is based on students' existing knowledge level and English skills. Through the teacher's guidance and explanation, combined with students' viewing of microvideo and textual materials in class, students complete their understanding and assimilation of knowledge points of English academic research papers through
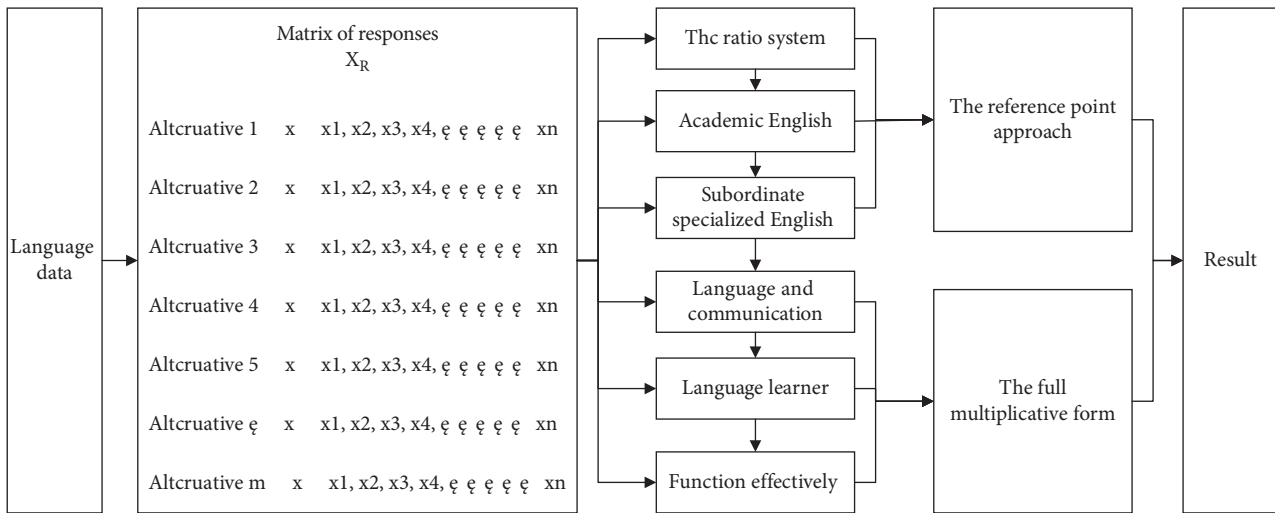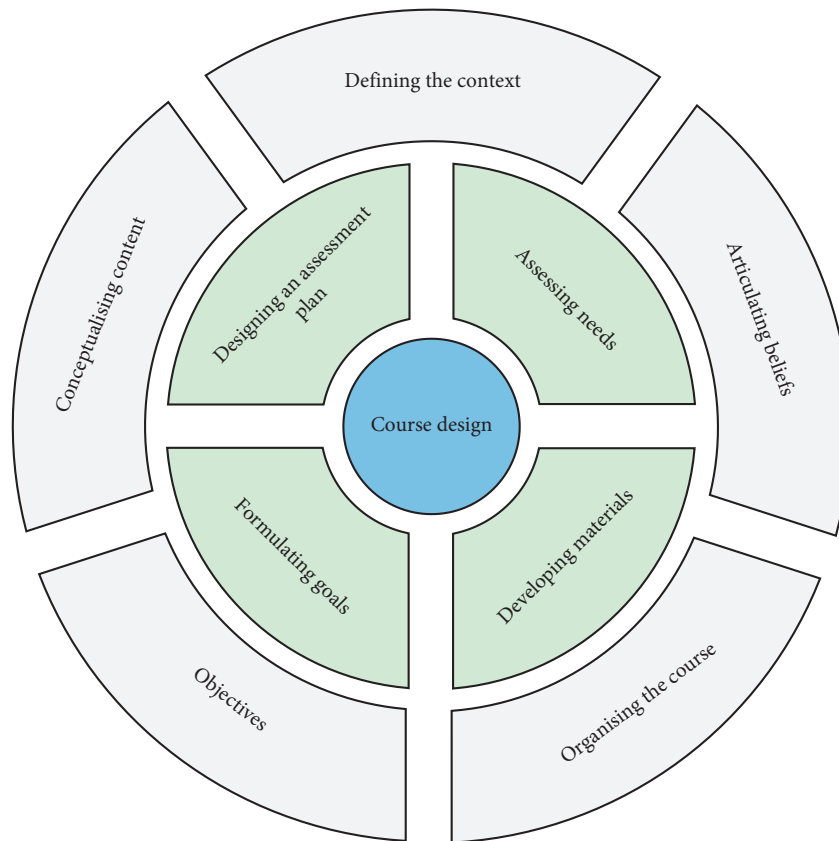
Figure 2: Random matrix optimization process.

Figure 3: Course design process model.

independent inquiry, group learning, and collaborative learning, complete project, and task-based activities, and demonstrate the reading in a real-world format [20]. Through mutual evaluation among classmates and timely evaluation pointers and feedback from the teacher, the teacher, and each student can actively participate in the whole teaching process, jointly build a flipped classroom, and enhance classroom interaction and collaboration between the teacher and students as well as between students and students.

Needs analysis refers to the activity of gathering information that will serve as the basis for developing a curriculum that meets the learning needs of a specific group of students. The idea of English for Academic Purposes stems from the understanding of teachers of English for Special Purposes that all students in higher education have different learning needs and that this cannot be achieved by teaching them the same type of English. Academic English is necessary not only in countries where English is the native

language but also in countries where English is the official language and the language of instruction in higher education institutions. The planning and implementation of any academic English program should take into account the diverse language needs of the target learners. By identifying the language needs of learners, a solid foundation can be laid for the overall philosophy of teaching a particular language course. The entire process of course design, from the construction of course objectives to the selection of course content and learning activities, can be made easier. When the number of snapshots is much larger than the number of array elements, according to the theorem of large numbers and the central limit theorem, the sample covariance matrix of zero mean and unit-variance IID Gaussian noise output by the array element will tend to the covariance matrix, that is, the identity matrix, whose eigenvalues are all 1. As a result, the quality of the course can be ensured and learners can achieve the desired learning outcomes. That is why it is important to conduct a needs analysis to collect relevant data about learners' language needs.

In addition, the course designer summarized various research terms, methods, and tools commonly used in medical academic research papers, and by analyzing the chapter structure of all the papers found by students, these methods and tools covered all the medical journal papers involved in this study. Therefore, it is an obvious guide for students to grasp the basic topics and research types of medical research papers as well as the "methods" section, with strong reliability and validity, as shown in Figure 4.

This study analyzes classroom transcribed teacher discourse from the perspective of sentence structure, based on Poplack's classification of code-switching. Intersentential code-switching occurs at the demarcation of two sentences or clauses, and each belongs to a language separately. Intrasentential code-switching involves conversion within a sentence or clause. Academic English as a disciplinary cultural literacy, this orientation focuses on teaching students the meaning of some common sense and ritual and epistemology proven in a discourse culture to help them learn and socialize daily. Additional code-switching refers to the insertion of an additional component of another language into a sentence or clause expressed in a single language, which can appear anywhere in the sentence and is not fixed to appear at the end of a clause. Since the type of course selected for this study is a translation course, to highlight teacher discourse, the corpus involving translated texts such as teachers reading aloud translated answers and teachers repeating students' translated answers in the study materials were excluded in the analysis of code-switching.

After many repeated reading experiences, students' thinking will form a pattern of identifying problems, asking questions, analyzing problems, discovering theoretical bases, proposing solutions, and evaluating solutions [21]. In future independent reading, whenever reading scientific papers, the schema of hierarchical analysis of academic papers will be reproduced to help students quickly analyze the structure of the paper, obtain important and effective information in the paper, and thus better understand the important contents of the paper. The reproduction of schemas forms habits of

thought and ways of thinking. Once a thought schema is formed, it is extracted and comes into play in subsequent readings. This is the subtle influence of academic reading on academic thinking.

In the academic reading course involved in this study, the researcher provides learners with authentic academic research papers and uses supplemental materials created and refined by the instructor over several semesters. Thus, students may be encouraged to watch videos of each section of an academic paper or to read more academic papers in English published in medically important academic journals. When students learn this reading skill before class, they have the opportunity to reflect on their understanding and act on it when they need more help [22]. This promotes learner autonomy, the self-regulated learning theory adopted in this study, and allows students to be sufficiently motivated and self-monitor their learning. In addition, the fact that students can find more information about academic papers online and choose to research a particular discipline and specialization is one of the strengths of the flipped learning designed in this course.

5. Analysis of Results

5.1. Performance Analysis of the Random Matrix Optimized Bell Translation Model. In teaching practice, translation occupies a special position among the five basic skills of listening, reading, writing, and translating. From the perspective of input and output, listening and reading focus on input, speaking, and writing focus on output, while translation activities realize the conversion between different languages in a short period, involving both input and output factors. In the university English classroom, the involvement and participation in translation activities are conducive to the achievement of foreign language teaching objectives.

The simulation uses correlated signal sources, where the correlation coefficient of the first source and the second source is 0.6, the third source is independent of the first two sources with a fixed SNR of -3 dB, and the number of snapshots varies from 4 to 18, and the root means a square error of the three algorithms varies with the number of snapshots as shown in Figure 5. The estimation error of the RMT_E algorithm is lower than that of the MUSIC algorithm and WSF algorithm, and the estimation error of the three algorithms tends to be the same when the number of snapshots is very low, but as the number of snapshots increases, the error of RMT_E algorithm will be significantly lower than that of MUSIC algorithm and WSF algorithm.

The probability of flying points of the three algorithms decreases as the number of snapshots increases; meanwhile, the probability of flying points of the RMT_E algorithm is lower than that of the MUSIC and WSF algorithms, and it can also be seen from the probability of flying points that the errors of the estimated angles of the RMT_E and WSF algorithms still fall more within the estimation error of 0.5, while the MUSIC algorithm has more flying points. Therefore, the accuracy of the RMT_E algorithm estimation is significantly higher than that of the MUSIC and WSF algorithms. Bell believes that the translation process is a
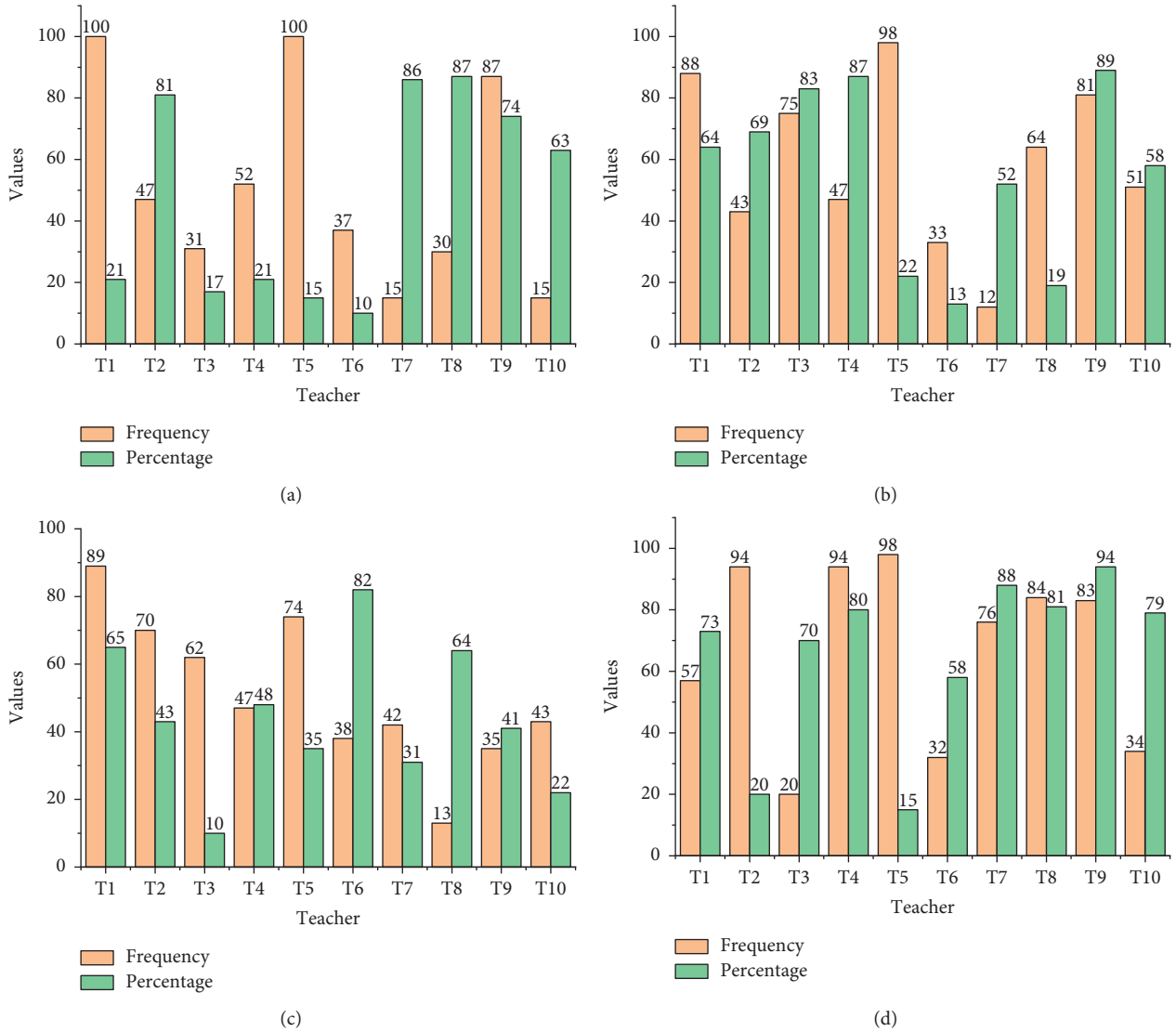
(a)

(b)

(c)

(d)

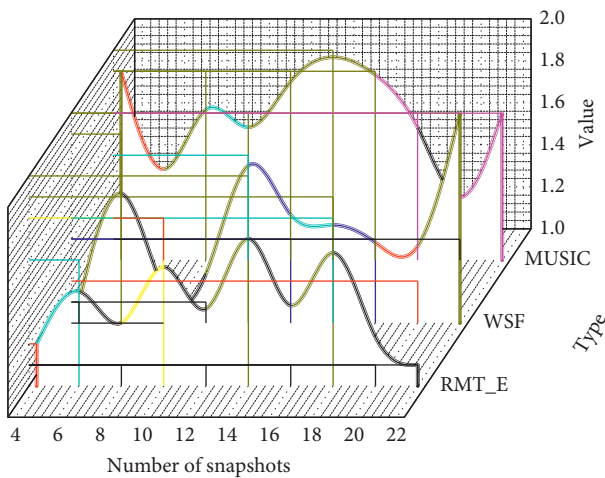FIGURE 4: Distribution of code-switching categories.

FIGURE 5: Curve of estimation error with the number of snapshots.

special case of the phenomenon of human information processing, which can be described by psychological information processing theory.

Then the weighted subspace based on the random matrix eigenvector (RMT_V) algorithm is proposed, the weighted matrix under this algorithm is calculated, and the spatial spectra of MUSIC algorithm, weighted subspace (WSF) algorithm, weighted subspace based on random matrix singular value (RMT_E) algorithm and weighted subspace based on random matrix eigenvector (RMT_V) algorithm are drawn for the relevant signal sources. The results show that the trends of the WSF, RMT_E, and RMT_V algorithms are approximately the same, but the magnitude of the RMT_V algorithm is slightly higher than that of the RMT_E and WSF algorithms. The simulation of the variation of estimation error and fly point probability with S/N ratio for the above four algorithms under the conditions of correlated

and uncorrelated signal sources with small snapshot numbers, as well as the simulation of the variation of estimation error and fly point probability with snapshot numbers for the four algorithms under the conditions of correlated signal sources with low S/N ratios, are shown in Figure 6.

The limiting spectral distribution function of a high-dimensional random matrix is built after the Stieltjes transformation, but in most cases, there is only an implicit expression, and the nature of its distribution is not well explored. In this paper, a universal nonparametric estimator is given to estimate this implicit distribution function, explore its distribution law, and prove that the estimator is consistent. Also, the rate of convergence of the estimated function is calculated; in practical applications, the parameters involved in the limiting spectral distribution are usually unknown and based on this consideration, a statistical method is developed to estimate the regression parameters under these vector time series models, and it is shown that these estimates are consistent estimators and robust to anomalous observations.

Under finite sample conditions, there is a systematic deviation between the mean and variance parameters of the empirical distribution of the linear spectral statistic and those of its asymptotic distribution. Accordingly, a central limit theorem for the linear spectral statistic Hp that takes into account the influence of outlier eigenvalues is proposed, which can significantly eliminate such differences. Long-term memory is the total storage of knowledge in the human brain, which is all information except the information processed by working memory. Long-term memory provides resources for cognitive processing, and working memory provides means for cognitive processing. Therefore, it is of great interest to use this Hp central limit theorem when performing statistical hypothesis tests such as high-dimensional spherical array tests, unit array tests, and biased spherical array tests to improve the accuracy of the tests to a large extent.

5.2. Experimental Results of English Translation Teaching Mode in Higher Education. Code-switching is contextualized and includes the teacher's pedagogical ingenuity. From the above specific teacher's words, we can see that the T6 teacher used the phrase "distinguish and refine" to summarize the steps of translating long sentences and explained each small point of the phrase in English. In this way, the number of code-switching cases rose sharply, but when we look deeper into the teaching process, we can see that the T6 teacher has solid language skills and a sophisticated teaching design. The use of native language summaries can avoid the complicated and lengthy translation steps in English, reduce the students' burden of comprehension and memorization, and achieve the function of highlighting the teaching focus, as shown in Figure 7. This shows that frequent code-switching does not indicate a problem with the teacher's language ability, but as a teaching tool for the teacher to achieve the teaching purpose and strengthen the teaching effect through code-switching. To make the proportion of the three types of code-switching clear, a pie chart was made.
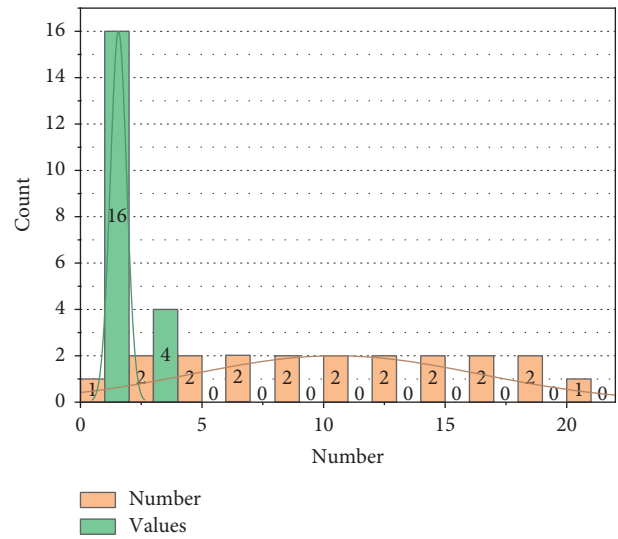

FIGURE 6: Empirical density function of the standardized linear spectral statistics and its theoretical density function.
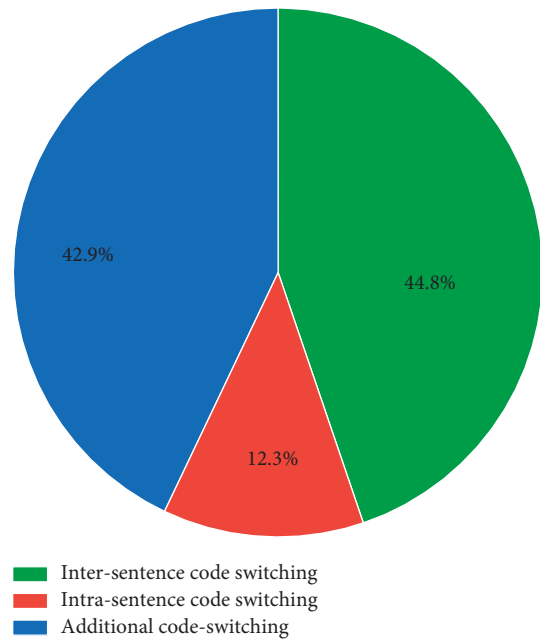

FIGURE 7: Percentage of code-switching.

In the translation classroom, intrasentence code-switching accounted for 57.46% of the teachers' discourse, intersentence code-switching accounted for 41.53%, and additional code-switching accounted for the least, at 1.01%. This indicates that teachers are more likely to use their native language within sentences or clauses and between sentences, suggesting that teachers are meticulous in code-switching and that the teaching process considers students' uneven English proficiency and the complexity of their expressions.

In the translation classroom, the teacher asked 61.50% of the demonstrative questions and 38.50% of the referential questions. The fact that there were far more demonstrative questions than reference questions is related to the nature of the classroom selected for this study. And because the spatial
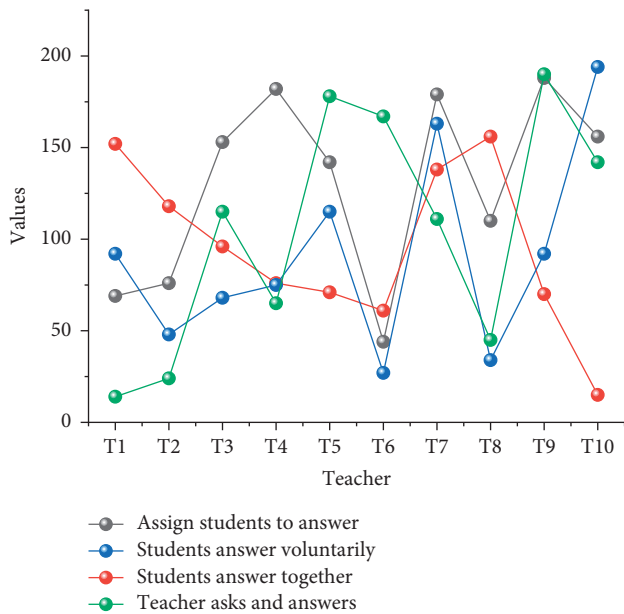
FIGURE 8: Frequency distribution of teachers' questions pointing.

may occur because of the limitation of 20-minute participation time, the teachers' focus on completing translation teaching tasks in a shorter period, many demonstrative questions as targeted teaching initiatives, and the fact that referential questions require a large amount of time to answer, which would take up too much teaching time. Because English for Specific Purposes focuses on teaching specific language and communication skills, English for Academic Purposes curriculum design typically includes a phase in which curriculum designers (teachers) determine what specific languages and skills are needed by a population of language learners. At the same time, translation teachers are aware of the importance of referential questions and expect teachers to use as many referential questions as possible in actual translation teaching to stimulate students' language output and improve their thinking skills.

6. Conclusion

The transformation from a teacher of general English to a teacher of academic English requires, as far as teachers are concerned, a change in the inherent traditional concepts. We need to break out of the misconception that some college English teachers regard academic English as professional English or bilingual teaching. In academic English courses and teaching, college English teachers do not necessarily need to have strong subject-specific expertise. In this process of translation practice, many systems of phonology, vocabulary, and syntax of the source language stored in students' long-term memory undergo a process of clarification from vague to clear. After the analysis, the original Chinese sentences formed semantic representations, and although the abstraction could not be clearly described in words, the semantic representations were indeed the students' understanding of the meaning of the expressions in the source language. It will be determined and considered based on learners' current state of knowledge, their understanding of their own needs, and the actual possibilities and constraints of the teaching environment. After arriving at the semantic representation of the original Chinese, the students expressed the semantic representation of the original language in English form through various syntheses. Thus, the translation activity is indeed a very complex process of understanding, analyzing, synthesizing, and choosing. In this process, various cognitive and psychological factors in students' brains are mobilized to the maximum extent for active thinking, which is the inherent advantage of the translation teaching method. To sum up, the translation teaching method has greater feasibility and applicability advantages. In the teaching practice, we should combine the translation teaching method with the communicative teaching method to form the best teaching mode suitable for local students and achieve the best teaching effect.

smoothing algorithm needs to divide the subarrays uniformly to make the linear manifold matrix of the subarrays the same, to complete the process of spatial smoothing, another limitation of the algorithm is that it is only suitable for uniform equidistant linear arrays. In the translation teaching classroom competition classroom, the teaching time was only 20 minutes, and the participating teachers focused more on the accomplishment of the lesson objectives in the classroom, and the demonstrative questions within the predetermined range were the best choice. The translation teachers also realized the positive role of reference questions in the teaching process and used them as much as possible to stimulate students' divergent thinking and increase the quantity and quality of students' discourse output, provided that they were relevant to the content of the lesson.

The translation of English vocabulary and the explanation of English expressions by the translation teacher reflect the pedagogical function of code-switching. To make students' understanding of knowledge clearer, the teacher translates it into Chinese and then explains it in English. The teacher compares the syntactic structure of the English and Chinese languages to explain that English is a morphological language and Chinese is a meaningful language, reflecting the meta-linguistic function of code-switching. The teacher's use of humor and the use of Chinese to guide the students in the translation reflected the communicative function of code-switching. The teacher's switch to Chinese reduced students' anxiety in answering questions and made them more willing to actively participate in classroom activities, as shown in Figure 8.

This study found that teachers used demonstrative questions much more frequently than referential questions in the translation classroom, and teachers used more demonstrative questions to guide students in learning methods and strategies for translating long sentences. Such results

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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