Scalable Computing: Practice and Experience, ISSN 1895-1767, http://www.scpe.org
© 2024 SCPE. Volume 25, Issues 6, pp. 5585–5592, DOI 10.12694/scpe.v25i6.3354

THE EXISTENCE AND DEVELOPMENT OF VARIANTS IN ENGLISH WRITING TEACHING IN INTERNATIONAL CORPUS BASED ON TIME SERIES DATA ANALYSIS

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Abstract. This study investigates the evolution and prevalence of variant forms in English writing instruction within an international context, utilizing a time series analysis of corpus data. Recognizing the dynamic nature of language, especially in educational settings, this research aims to identify and analyze the changes in teaching methodologies and language usage over time. By examining a comprehensive corpus compiled from diverse international sources, the study focuses on how English writing instruction has adapted to linguistic variations and evolving pedagogical approaches.The methodology involves a quantitative analysis of corpus data spanning several decades, enabling a longitudinal view of trends in English writing teaching. The corpus includes a wide range of educational materials, academic publications, and teaching resources from different countries, ensuring a global perspective. Time series analysis is employed to track the frequency and context of various teaching practices and linguistic forms, offering insights into their development and dissemination.Key findings reveal a significant shift in teaching strategies, reflecting an increased emphasis on learner-centered approaches and the integration of digital technologies. Variants in language usage, influenced by cultural and regional differences, are also evident, highlighting the importance of context-specific teaching methods.

Key words: existence and development,international corpus,time series data analysis

1. Introduction. The study underscores the need for adaptive and inclusive teaching practices in English writing education to accommodate linguistic diversity and changing educational paradigms.This research contributes to the understanding of how English writing instruction has evolved in response to global linguistic trends and educational demands. It provides valuable implications for educators, curriculum developers, and policymakers in shaping effective and responsive English writing programs in an increasingly interconnected world. In the realm of language education, particularly in the context of English writing instruction, the dynamic nature of language presents both challenges and opportunities for educators and learners alike. This research delves into the evolution and prevalence of various teaching methodologies and linguistic forms in English writing instruction, examined through a comprehensive time series analysis of international corpus data. The overarching goal is to understand how English writing teaching has adapted over time in response to the ever-changing linguistic landscape and pedagogical trends.

The significance of this study lies in its focus on the global variations and developments in English writing instruction. As English continues to dominate as a lingua franca in academic and professional settings, understanding these variations is crucial for developing effective teaching strategies that are both inclusive and adaptable to diverse linguistic backgrounds. By analyzing a rich corpus of educational materials, academic publications, and teaching resources from various international sources, the research offers a unique insight into the trends and shifts in English writing education over several decades. Our methodology employs a robust time series analysis of the corpus data, enabling us to track and quantify changes in teaching practices and language usage. This approach allows for a detailed examination of how specific teaching strategies and linguistic variants have emerged, evolved, or diminished over time. Furthermore, the study looks at the influence of cultural, regional, and technological factors in shaping these educational practices, providing a comprehensive view of the global landscape of English writing instruction.

The introduction of this research sets the stage for a detailed exploration of the findings and their implications for educators, curriculum developers, and policymakers. By understanding the trajectory of English

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writing teaching methods and the various linguistic forms they encompass, stakeholders in the field of language education can better tailor their approaches to meet the needs of a diverse and evolving student population.

The primary contributions of this study lie in its comprehensive investigation of the evolution and prevalence of variant forms in English writing instruction within an international context. By employing a rigorous time series analysis of corpus data, the research offers valuable insights into the dynamic nature of language and its adaptation in educational settings over time.

2. Related work. Research in applied corpus linguistics has been thoroughly explored. It categorize [5] the functions of a corpus into two main types: firstly, as a reflection of the social interaction function, and secondly, as a tool to enhance language processing efficiency. A corpus, containing frequently used words in everyday communication, can significantly boost daily communication skills when understood and utilized correctly [6]. Corpus-based teaching has become increasingly vital in foreign language instruction due to its structured collocation, consistent syntactic rules, and controlled language environment, bringing innovative concepts to the field. It is observed in daily social interactions that a corpus is prevalently used in spoken communication, influencing sentence structure. article[8, 18, 3] discusses the impact of corpus structure on English language teaching, demonstrating through research that corpus-based teaching methods aid in the acquisition of a foreign language. A corpus adheres to specific syntactic rules and can be memorized as a whole, easing communication burdens and enhancing the speaker's articulation skills, especially in spoken English[13, 17].

Nevertheless, the use of the corpus approach in English writing instruction has not received as much emphasis [1, 11]. The current view is that corpus teaching significantly benefits the writing process by enhancing the accuracy and fluency of learners' corpus usage. Article [12] discovered that the handling of high-frequency chunks is crucial for improving fluency in foreign language writing. This suggests that chunk-based teaching methods can enhance the linguistic capabilities of foreign language learners in China. Therefore, by mastering idiomatic chunks, learners can achieve more natural and fluent language output, enhancing their overall language proficiency. Article [2, 20, 10] notes that native speakers possess numerous linguistic chunks in their minds, allowing for more precise and smooth language use in everyday communication. If learners acquire a sufficient number of these chunks, it ensures more idiomatic and fluent language production [16, 19].

Article [9] investigated the integration of task-based and chunk-based teaching methods, finding that this approach fosters students' self-learning abilities and pragmatically improves their skills. Additionally, article [4, 14, 15, 7] explored a novel teaching model that merges mind mapping with chunk theory. Their experiments indicate that this model can somewhat enhance the efficacy of students' English reading skills.

While some research has explored the integration of task-based and chunk-based teaching methods, noting their positive impact on students' self-learning abilities and skill improvement, there remains a gap in understanding how to effectively integrate corpus-based approaches into writing instruction. Additionally, investigations into novel teaching models that combine mind mapping with chunk theory have shown promising results in enhancing students' English reading skills. However, further research is needed to validate and refine these approaches for broader implementation in language classrooms.

Bridging the gap between theoretical insights into corpus-based language teaching and practical application in writing instruction remains challenging. Issues such as identifying appropriate corpus resources, designing effective teaching materials, and integrating corpus-based activities into the curriculum remain areas of concern. Furthermore, ensuring that corpus-based approaches cater to the diverse needs and proficiency levels of learners poses a significant challenge. Addressing these gaps and challenges will be essential for advancing the effective integration of corpus-based methods into English writing instruction.

3. Methodology.

3.1. Data Collection. This take a look at's research statistics often originate from two distinct corpora: the chinese English newcomers Corpus (CLEC), comprising university-stage CET-four and CET-6 exams (ST3 and ST4), and the LOCNESS corpus, which incorporates essays with the aid of American university college students (brusR1, BRSUR2, BRSUR3, USARG). The phrase counts for the CLEC and LOCNESS corpora are 416,476 and 245,321, respectively. This research specifically makes a speciality of the phrase "as an alternative" to investigate a singular technique to university English vocabulary preparation. In English writing and speech,

"as an alternative" is flexible, serving as an adverb to intensify the speaker's tone and expression and along with phrases like "might," "than," and "however" to deliver subjective goals, choices, or differences in objective truth.

To encompass a extensive range of subjects and reflect present day English utilization, the look at compiled subtitles from 112 acclaimed English movies and documentaries, developing a complete movie and tv corpus. This corpus consists of each time-honored classics and current standout movies. The key attributes of this corpus are certain in table 4.1. At the have a look at's conclusion, questionnaires have been distributed to 45 college students inside the experimental group, with all 45 being correctly finished and returned. The questionnaire became structured into 4 sections, with each phase's questions similar to five feasible responses. The facts evaluation become carried out the use of SPSS19.Zero

3.2. Learning of Design. Instructional design rooted in constructivism places significant emphasis on crafting a conducive learning environment, setting it apart from traditional teacher-centred approaches. The assert that a learning environment serves as a space where learners can harness various tools and information resources collaboratively to pursue learning objectives and engage in problem-solving activities. This perspective broadens the concept of a learning environment to encompass the tools and information resources employed in the learning process. A constructivist learning environment model, as illustrated in Figure, comprises six key components.

To effectively grasp any problem, learners must possess relevant experiences and the ability to construct corresponding mental models. However, novice learners often lack such experience, which is crucial for problem-solving. Thus, a constructivist learning environment assumes a pivotal role in providing learners with a plethora of pertinent examples for reference. The presence of related instances in constructivist learning environments serves a dual purpose:

Firstly, it aids in memorization. When individuals encounter a problem or situation for the first time, they instinctively search their memory for similar cases they have previously resolved. By comparing current situations with past experiences and lessons, learners can apply previously successful problem-solving methods when the goals or conditions align. Therefore, relevant instances assist in memory retention by offering representations of experiences that learners may not possess.

Secondly, it enhances cognitive flexibility. Within the framework of cognitive flexibility theory, an offshoot of constructivism, traditional teaching often oversimplifies complex problem backgrounds, providing students with a one-sided understanding of the issue. This theory advocates presenting various representations and explanations to illustrate the intricacies of the knowledge domain, interconnections between concepts, and relationships within the concept. Moreover, it encourages the presentation of multiple perspectives on various issues through multiple and related instances. Therefore, to nurture cognitive flexibility among students, relevant examples should present diverse viewpoints and angles on the problem to be solved.

The application of corpus-based intelligent technology in English education encompasses several aspects. These include pre-class previews, interactive exercises, learning resource management, and personalized learning resource recommendations tailored to individual preferences and needs. Adaptive, interactive, intelligent, and precise teaching and learning are achieved through the implementation of adaptive learning methodologies. The intelligent preparation of lessons provides access to a wealth of teaching resources, and during intelligent teaching sessions, a "smart classroom" enables seamless cross-system and interactive teaching. Furthermore, the intelligent system automatically generates visual classwork scenarios, while the intelligent teaching and research platform facilitates the creation of online teaching and research communities, bridging online and offline education and enhancing teacher professional development.

3.3. Constructing a Corpus-Assisted English Teaching Model. Corpus-assisted English teaching can be outlined in the following steps:

1. Under the guidance of teachers, students select research questions aligned with course content and their interests. Concurrently, instructors should impart fundamental corpus retrieval methods to lay a strong foundation for subsequent coursework and activities.
2. Students create a comprehensive study plan through group discussions and teacher guidance. This plan serves as a roadmap for students' research activities, providing clarity on the research process.

3. This phase involves the collection and reading of literature through various means, such as reference books and online resources. Additionally, data collection methods like questionnaires, interviews, field investigations, and data analysis using relevant statistical software are employed. Corpus retrieval aids in addressing language-related issues, alleviating the lack of post-class teacher guidance.
4. Students receive guidance and suggestions from teachers and peers, identifying research issues and areas for improvement. Corpus retrieval continues to play a crucial role in addressing language-related challenges encountered during the research process.
5. Students summarize their research findings in the form of research reports. This phase significantly enhances students' English academic writing skills and style awareness. Corpus retrieval helps resolve language-related issues, including vocabulary, grammar, sentence structure, and collocation.

Traditional college English reading instruction typically revolves around text-centered activities. However, by adopting an intelligent teaching approach, teachers can transcend the limitations of textbooks. They can analyze the text's central theme, search for extensive real corpus materials related to the text's main idea, and provide students with a wide range of reading resources. Furthermore, teachers can design diverse teaching activities based on corpus materials to cultivate students' critical thinking, practical skills, and intercultural communication abilities. This dynamic approach to English reading instruction enhances the overall learning experience.

3.4. Virtual Corpora development. The prevalence of personalized virtual corpora in contemporary usage can be attributed to their distinct advantages. Firstly, personalized virtual corpora harness the vast resources of the Internet to construct small corpora tailored to specific topics, perfectly catering to the personalized requirements of users, especially in the realm of ESP (English for Specific Purposes). Secondly, virtual corpora are remarkably user-friendly. Creating a virtual corpus typically takes only 3-4 seconds. Furthermore, many platforms offer comprehensive construction guidelines, enabling users to effortlessly build their personalized virtual corpora following these instructions.

The process begins by accessing the corpus platform website http://corpus.byu.edu/wiki/ and registering or logging in. Next, navigate to the "Search" option on the main page and select "Create Corpus" to enter the Corpus creation page. Then, input the core term for the virtual corpus to be constructed, such as "Flight Procedure," and click "Find matching strings." This action will display all relevant content related to the specified term. To further refine the corpus, select "SORT/LIMIT" and then choose "Relevance." Additionally, the "MINIMUM" option can be utilized to filter out text sections with the lowest occurrence frequency of keywords, facilitating subsequent corpus editing. Finally, click "Save List" to assign a name and save the corpus, completing the creation of a personalized virtual corpus. Users also have the flexibility to edit and delete the corpus as needed, aligning with various language research objectives.

Content-based recommendation algorithms primarily offer recommendations by considering the attribute characteristics of individuals or items. This algorithm's strength lies in its ability to recommend items to users based on their preference characteristics, addressing the challenge of suggesting new items. Consequently, the selection of the similarity function is of paramount importance. By computing the similarity between individuals, we can accurately identify the nearest neighbor's set by sorting the similarity degree in descending order. The similarity between users is calculated using the chosen similarity function, resulting in a set of nearest neighbor users (excluding the target user). The Euclidean distance similarity algorithm [8, 18] calculates similarity, and the formula is as follows:

$$Similarity(Si(n), Sj(n)) = Cosine\ Value\ of\ the\ Angle\ Between\ Space\ Vectors\ Si(n), Sj(n)$$

The vectors' similarity is directly proportional to this value.

Intelligent English teaching evaluation finds application in various scenarios, leveraging an intelligent diagnostic evaluation system to analyze students' pre-class learning status and activate their existing knowledge and experiences. It evaluates classroom and individual practice data and provides timely feedback as a corrective measure. Post-class, the system monitors learning outcomes through online assignments to facilitate review and reinforcement. The developed algorithm encompasses comprehensive intelligent English teaching evaluation scenarios, covering listening, speaking, reading, and writing. This approach ensures that students remain closely aligned with the teaching content at all educational levels—before, during, and after class. It

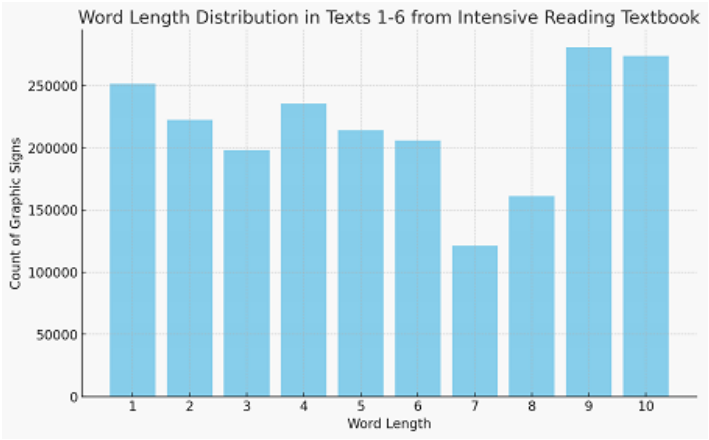

Fig. 4.1: Word Distribution and Recognition

reinforces cultural background understanding, accurate pronunciation, linguistic logic comprehension, and self-assessment, aiding students in constructing a comprehensive knowledge system from pre-class preparation to post-class review.

The similarity between the vectors of user Si(n) and user Sj(n) is expressed through the cosine value of the angle between the space vectors, with similarity directly proportional to this value [20].

Data analytics allows researchers to identify and analyze long-term trends in educational data. By examining patterns and changes over time, educators can gain insights into the effectiveness of instructional strategies, student performance trajectories, and evolving educational practices. Time series data analytics enables educators to forecast future trends and make predictions based on historical data. This can be applied to predicting student outcomes, identifying at-risk students, and optimizing resource allocation to improve educational outcomes. Researchers can use time series data analytics to evaluate the impact of interventions or educational programs over time. By comparing data before and after the implementation of an intervention, educators can assess its effectiveness and make informed decisions about program improvements.

4. Result analysis.

4.1. Statistical measures. Several corpus parameters, as outlined in the introduction of common statistical parameters for corpora, encompass types, tokens, type-token ratio, words per sentence, and others. Among these, the word length distribution function proves valuable in computing the distribution of word lengths within a corpus. This parameter holds significant reference value for evaluating the complexity and linguistic style of the corpus text. Figure visually presents the word length distribution within texts 1–6 from the intensive reading textbook of College English.

Upon examination of the figure, it becomes evident that there are 235,364 graphic signs with a word length of 4, constituting 18% of the total. The overall count of graphic signs stands at 39,149, with word length distributions covering the entire spectrum.

The posttest results of the control class of the experimental class compared with the t-test results of independent samples showed that the t-distribution value of the test was 2.508, and the corresponding significance SIG value was 0.014, which was less than 0.05 to reach the significance level. Therefore, there was significant difference between the results of the posttest results of the control class of the experimental class. According to the statistical results of the classification mean, the posttest score of the experimental class was 38.53, which was significantly higher than that of the control class (35.07). It can be seen from this that compared with the traditional grammar teaching mode, flipped classroom teaching mode has made great progress in students' grammar scores.

The figure 4.1 will display the word length distribution within texts 1–6 from the intensive reading textbook. It will plot the number of graphic signs (or words) against their respective lengths. For instance, as stated,

Table 4.1: Key Statistical Findings Summary

Parameter	**Value**
T-distribution Value	2.508
Significance (SIG) Value	0.014
Posttest Score - Experimental Class	38.53
Posttest Score - Control Class	35.07
Score Increase in Experimental Class	4.24

there are 235,364 graphic signs with a word length of 4. This pattern will be graphed for other word lengths as well.

The table 4.1 will compare the post-test results of the control class and the experimental class using the t-test. Key data points to be included are:

1. T-distribution value
2. Significance (SIG) value
3. Posttest scores of both the control and experimental classes
4. The increase in average score in the experimental class

Let's create these visual representations. I'll start with the graph for word length distribution. Since the specific distribution data for all word lengths isn't provided, I'll use a hypothetical distribution that includes the provided data point (235,364 graphic signs for word length 4). Afterward, I'll create the table for the comparison of the control and experimental classes.

This table 4.1 provides a clear comparison of the control and experimental classes, highlighting the significant difference in post-test scores and the effectiveness of the flipped classroom teaching model.

Through the analysis of the test results of the control class, it is found that the students' grammar level has been improved under the traditional grammar teaching mode, but the effect is not obvious. Through the analysis of the test results of the experimental class, it is found that the application of flipped classroom teaching mode has greatly improved students' English grammar level, and the overall average score of the class has increased by 4.24 points. In conclusion, the flipped classroom teaching model based on ARCS model can improve students' grammar application.

4.2. Corpus analysis. In this instructional approach, the flipped classroom is segmented into two distinct phases: the preparation stage and the implementation stage. The preparation stage primarily caters to the teacher's responsibilities and encompasses three key components: the selection of course materials prior to the class, the design of the syllabus plan, and the creation of teaching videos. On the other hand, the implementation stage of the flipped classroom focuses on classroom teaching and the attainment of specific learning objectives. This phase involves reviewing relevant knowledge through the examination of teaching videos, mastering knowledge through assessments and group activities, and consolidating and refining knowledge through summarization.

Intelligent English teaching evaluation finds practical application in various scenarios. It relies on an intelligent diagnostic evaluation system to analyze students' pre-class learning status and activate their existing knowledge and experiences. This approach involves scrutinizing both class and individual classroom practice data and providing timely feedback as a remedial measure. Following the class, the system promptly assesses the learning outcomes through online assignments, enabling review and reinforcement. The developed algorithm encompasses comprehensive intelligent English teaching evaluation scenarios, encompassing listening, speaking, reading, and writing. It ensures that students remain aligned with the teaching content at all educational levels—before, during, and after class. This approach reinforces cultural background understanding, accurate pronunciation, comprehension of linguistic logic within the teaching content, and the development of self-assessment skills. Ultimately, it empowers students to construct their knowledge systems, spanning from pre-class preparation to post-class review

5. Conclusion. In the era of intelligence, the core essence of the English subject has been significantly augmented by the integration of artificial intelligence technology into every facet of English education. This

study has successfully established an English teaching platform rooted in personalized virtual intelligence. The application of artificial intelligence technology to English education, spanning the domains of listening, speaking, reading, and writing, has greatly enhanced the teaching process. It has not only assisted teachers in their instructional roles but has also contributed to educational research, ultimately rendering English teaching more efficacious in nurturing students' core competencies within the English subject and fostering their cultural awareness.

The corpus-data-driven approach to college English teaching has transcended the confines of the traditional "classroom + textbook" model. It has ushered in a student-centered paradigm that emphasizes task-oriented, exploratory, and autonomous learning. This paradigm aligns with the evolving landscape of economic development, new technologies, emerging industries, and the distinctive Chinese engineering education system. Through practical implementation, we have identified three crucial areas that require attention in future teaching:

1. Monolingual corpora like COCA and BNC may pose challenges, especially for non-English majors. Hence, strategies to facilitate comprehension must be devised.
2. Students may find complex original search results tedious and bewildering. Therefore, it is imperative to prioritize student engagement and motivation.
3. Employing the DDL mode demands meticulous planning of teaching activities, exercises, and the creation of micro texts. This places a considerable workload on teachers, necessitating robust support from teaching teams for widespread adoption and implementation.

Looking ahead, our future endeavours will delve deeper into DDL-based college English teaching practices. We aim to employ quantitative research methods to gauge the model's impact on enhancing students' comprehensive abilities. Continuous refinement and the collaborative guidance of teachers will be pivotal in shaping an innovative and highly effective English learning experience for Chinese learners, marking a significant stride towards intelligent and enlightened English education. marking a significant stride towards intelligent and enlightened English education. Incorporating advanced machine learning algorithms, such as deep learning models, can enhance the accuracy and predictive capabilities of time series data analysis. These techniques can help in identifying complex patterns, detecting subtle correlations, and making more accurate predictions about student performance and learning trajectories.

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Edited by: Sathishkumar V E
Special issue on: Deep Adaptive Robotic Vision and Machine Intelligence for Next-Generation Automation
Received: Feb 9, 2024
Accepted: Apr 8, 2024