

# Research on the Impacts of Artificial Intelligence Technology on Language Teaching Innovation

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**Abstract:** *Artificial intelligence has been integrated into our life and education, which is constantly changing our life style and our traditional college English teaching and learning methods. As an advanced and mature popular technology ; on the one hand, College English teaching as a traditional language and culture education on the other hand, the integration of the two can well meet the needs of training innovative talents in the new era. However, its development and application are still in the exploratory stage. This paper first analyzes and studies the role and development of artificial intelligence technology in College English teaching. Then, it illustrates the in-depth integration of the two can better serve English Teaching in the future; and after some survey of taking online courses during the pandemic COVID-19, the paper puts forward suggestions or prospects for the application and development of artificial intelligence technology in personalized College English teaching.*

**Keywords:** *artificial intelligence, intelligent classroom, college English teaching, individuation*

## 1. Introduction

Research on artificial intelligence originated about 60 years ago which covers the areas of psychology, linguistics, mathematical methods, and computer sciences [1]. Many experts explore the phenomena of the emergence of the use of artificial intelligence in teaching and learning in higher education [2]. Kessler studied the extent to which technology - mediated social interactions dominate our daily lives, how we can leverage those interactions to the benefit of our learners, and how we can engage them in learning experiences in ways that will encourage them to practice language extensively [3]. Zhang discusses and analyses effective strategies of interactive teaching English in higher vocational colleges based on artificial intelligence technology from the analysis of students' demand, optimizing the teaching organization form, teaching means, assessment methods and other aspects to help higher vocational teachers assist students to learn English more independently, efficiently, with high quality and personalization [4]. Li, and Liu explore the enlightenment of new technology to language service, especially in oral English teaching, while oral English Corpus needs to be built [5]. Xu points out the rapid development of science and technology such as artificial intelligence, big data, informatization, and networking has led to the growing demand for online English learning, and the problem of lack of emotion in online English teaching has become increasingly prominent [6].

In the past decade, China's education policy has been constantly encouraging and promoting information-based education. The Action Plan of Education Informatization 2.0 issued in 2018 emphasizes the integration of artificial intelligence into the actual teaching environment through big data collection and analysis, so as to realize individualized teaching. With the development of computer technology, network and smart phone technology, artificial intelligence and big data information technology have been widely used in industry, finance, medical, news media, education and other fields, making the Chinese production more intelligent and efficient, making people's life more convenient and beautiful. Similarly, artificial intelligence technology brings opportunities for the development of English teaching mode. In the field of College English teaching, the application of artificial intelligence is more and more extensive, which can effectively improve the quality of education, promote personalized education, and further promote the reform of education and learning methods. The integration of artificial intelligence and English teaching is still in the exploratory stage, but it still faces some limitations and challenges.

## **2. Connotation and application significance of artificial intelligence technology**

### ***2.1 Connotation of artificial intelligence technology***

Artificial intelligence technology covers a very wide range of disciplines, including robot, language recognition, image recognition, natural language processing and expert system, and the like. The technology has experienced more than 60 years of development, the theory and technology are increasingly mature, and the application fields are more and more extensive. It can solve some complex work which usually needs human intelligence to complete. Artificial intelligence teaching system integrates big data intelligence with Internet, big data and multimedia intelligence, which will provide the learner with accurate learning situation analysis and scientific learning path.

### ***2.2 Relevant encouraging policies in educational development planning***

On April 13, 2018, China's Ministry of Education issued the Action Plan of Education Informatization 2.0, which proposed the innovative development action of smart education. Based on emerging technologies such as artificial intelligence, big data and Internet of things, relying on various intelligent devices and networks, the teachers actively carry out research and demonstration of intelligent education innovation, and promote the mode transformation and ecological reconstruction of education supported by new technologies. The teachers should carry out the exploration and practice of smart education, and promote the reform and innovation of educational ideas and modes, teaching contents and methods.

In College English teaching, how to realize the innovation and development of smart education is a problem to be solved at present. To cultivate innovative talents to meet the needs of the information age, needs taking informatization as an important driving force of College English teaching modernization, in order to promote the application of information technology in English modernization education, especially the deep integration of intelligent technology and English education and teaching.

### ***2.3 The role of artificial intelligence in College English teaching***

The integration of artificial intelligence technology with College English teaching makes the teaching method more flexible. In the artificial intelligence classroom, teachers can use different teaching schemes and modes to cultivate students' various abilities. With artificial intelligence technology teachers can make full use of high-quality English education resources and promote the balanced development of high-quality English education. They will expand the sharing of high-quality English education resources, help students in remote and poverty-stricken areas to enjoy a fair and satisfactory education, and give full play to the targeted poverty alleviation of English teaching. Smart education will change the standardized talent training mode and cultivate talents with critical thinking ability and practical creativity [7]. Hence, the integration of artificial intelligence technology with English teaching promotes the transformation of English teaching talents training mode and cultivates innovative and personalized talents.

In the era of artificial intelligence, to promote the deep learning of College English [8], teachers can use intelligent terminal, according to the syllabus and teaching objectives, develop hierarchical teaching schemes, dynamically monitor each student's English learning ability; they can use the individualization of artificial intelligence teaching, and create targeted learning methods, so as to master each student's learning dynamic real-time record on the intelligent platform. According to the learning records of each student, teachers can understand the learning level of students, and provide students with targeted guidance and feedback, which is conducive to improving teaching efficiency; through intelligent teaching resources, teachers can also promote collaborative teaching between teachers and students, break the limitation of time and space in traditional classroom teaching, and crack down on the fact that excellent teacher resources are only available to students and one student in limited classes limited for only one teacher. Students can use the platform to interact from different teachers and students in different regions to obtain diversified knowledge, solve the problem of singleness of knowledge and learning method, give full play to the subjective initiative of learning and actively communicate with the outside world, which is conducive to breaking the students' rigid thinking mode.

### **3. Application of artificial intelligence technology in College English teaching**

#### ***3.1 Demand and trend of AI English teaching development***

The novel coronavirus pneumonia broke out throughout the whole country in 2020, which affected people's life. In order to win the battle and protect the health and safety of the people, the government adopted a series of measures. Novel Coronavirus Infection Leading Group Office of Ministry of Education issued the document "guiding opinions on the organization and management of online teaching in ordinary colleges and universities" during the period of epidemic prevention and control, and guided the request to actively carry out online teaching activities such as online teaching and online learning, relying on various online courses and various campus learning spaces. During the period, the teaching progress and teaching quality can be achieved. Some commercial platforms also began to provide online learning resources for free.

The first batch of 152 education apps were recorded in 2019, where in "one teacher, one excellent class, and one class one excellent teacher" activity, 10005 excellent courses were chosen at the ministerial level. The number of online learning spaces for teachers and students has exceeded 100 million. This will inevitably promote or include the application of intelligent English teaching. Whether it is the demand of educational informatization development or the needs of special period, smart English teaching will usher in considerable development. Through the analysis of the retrieval results of CNKI database, more than 10000 literatures are found to be related to multimedia and English teaching, but the data in recent ten years show a downward trend year by year; more than 2700 are related to intelligent technology and English teaching, and the data show a rising trend year by year in the past ten years; and more 700 articles are related to big data and English teaching, which shows a rapid upward trend year by year. It can be seen that the research direction of intelligent technology and English teaching will be a hot issue, especially the comprehensive application research of big data. By analyzing the big data of CNKI, it is found that only 6.7% of the research on smart English teaching is conducted. Due to the diversity of English teaching activities and the English learning mechanism formed by exam oriented education, artificial intelligence has not been widely applied in the basic education stage [9]. Although multimedia teaching is still the main auxiliary teaching method, with the continuous development of artificial intelligence and the demand of training new talents, the application of artificial intelligence technology in English teaching is the inevitable trend of future education development

#### ***3.2 Application of artificial intelligence technology in College English teaching***

On the current situation and development trend of smart education research, Zheng Qinghua and others analyzed the mainstream smart education platforms at home and abroad [10] in the literature, put forward the limitations of current smart education research, and summarized the research and development direction of smart education. Chen Kaiquan studied the exploration of artificial intelligence to reshape learning path [11]. At present, researchers have made a more in-depth discussion on the theory and path of the application and development of intelligent education. However, in the field of English teaching, especially in primary and secondary schools, the construction of a new online intelligent learning system with human-computer mutual adaptation, personalization and efficiency still needs to be explored. In a word, the construction of smart English classroom, and the establishment of interactive platform between teachers and students, is essential to reduce the pressure of teachers' teaching, and help students improve learning enthusiasm and efficiency.

First, to construct the ecological environment of smart English teaching

At present, there is no unified definition for the concept of smart English classroom at home and abroad. The core concept of smart English education is to build a smart classroom, which can improve the cultivation of students' innovative ability through the integration of artificial intelligence, big data and Internet with college English teaching. The construction of smart English classroom is to build an intelligent and efficient intelligent teaching platform based on tablet computers and mobile electronic terminals of smart phones by using intelligent information technologies such as Internet of things, cloud computing, big data, artificial intelligence, interactive teaching system and digital teaching resources. To achieve classroom teaching demonstration, classroom teaching interactive learning activities and offline teaching activities, it provides human-computer assistance for teachers and students, realizes interactive teaching platform, provides teachers with a variety of convenient services such as teaching plan, composition, reading, oral English, practice and so on. Teachers can upload the

edited resources or teaching tasks to the platform for students to use mobile terminals for self-study or collaborative learning. The preparation work can be completed by students before class through the mobile terminal, and debate can also be held between teachers and students. Through human-computer cooperation, more fair evaluation is given on the mobile terminal, which makes full use of classroom teaching time and improves efficiency. Online learning outside the classroom is an effective supplement to classroom teaching, such as reciting words, English writing exercises, listening and speaking exercises, situational reading, and so forth.

Second, to be applied to college English writing teaching

The artificial intelligence English platform can provide teachers and students with English writing practice guidance beyond the classroom and teaching materials by using the rich and diverse databases and online search engines on the Internet, to help students solve the problems of writing content, vocabulary, collocation, grammar, etc., which is conducive to students' autonomous learning outside the classroom and improve their English writing ability.

Teachers through tablet computers and students through smart phone terminals, construct a deeply integrated "pre-class, in-class, and out-of-class" learning environment. The teacher assigns the writing topic through the tablet computer intelligent terminal, and the students get familiar with the key vocabulary, grammar and other writing essentials online on the intelligent terminal before class. In class, students complete English writing within the given time. The smart platform evaluates and corrects each student's composition in real time, and generates evaluation and problem analysis for all students in the whole class. Teachers can solve problems in a centralized way according to the results of intelligent analysis, and make comments and real-time feedback. The function of immediate writing evaluation and correction can effectively help students improve their writing level and skills. After class, students can continue to feed back the basic knowledge and writing skills of College English writing on the platform, and they can also communicate with their classmates online to learn from each other, instead of relying entirely on the teachers in class. Therefore, to try to use all information technology and means can help students develop the habit of autonomous learning of writing.

Third, to be applied to college English listening and speaking teaching

Teachers can design a variety of situational teaching cases through the smart English platform, select classic original sound films and TV plays to introduce the listening and speaking teaching, and carry out online student Dubbing Competition, role play and imitation show and other colorful practice activities. The smart platform can also evaluate the performance of each student in real time, and students can correct their mistakes according to the evaluation. It is conducive to the expansion of college oral English teaching resources and the cultivation of students' learning interest and initiative. Hence AI can help students master the basis and skills of oral English, and improve the application ability of students' oral English.

Fourth, to be applied to college English reading teaching

At present, students do their reading mainly through college English textbooks, which limits the cultivation of students' reading interest. This English learning mode limits both the students' personalized development and teaching methods according to the student's aptitude. Using the Internet platform, the English reading function of smart mobiles can provide students a large number of resources. Teachers can select exquisite articles on the platform, and students can also read their favorite English resources online from the platform, which provides students with both teaching objectives and a diversity of language input. At the same time, teachers can evaluate students' learning behavior according to the students' reading feedback from the smart platform, so as to help students improve their learning methods and improve their comprehensive English level.

### ***3.3 Development and application of smart English platform***

The United States, Britain, India, Finland and other countries have developed educational application systems based on artificial intelligence technology. Many smart education platforms and applications in China mainly provide teachers with intelligent evaluation oriented to teaching process, including intelligent question bank, marking papers, homework marking, and the like, to reduce the teaching pressure of teachers and timely feedback and evaluate students' learning situation. The smart education series products by IFLYTEK in China have realized intelligent scoring for English teaching, and can complete intelligent English writing and oral English assessment. The platform provides teachers and students with abundant teaching resources and examination resources, and supports joint

examination, model test and class daily test [12]. It can help teachers to carry out English listening and speaking classroom teaching activities and support students to carry out personalized autonomous learning. And it can automatically collect and count the students' examination records and learning records, and form the analysis report of the examination and learning situation, and assist teachers in teaching research and teaching decision-making. The intelligent marking system can detect all kinds of blank questions except multiple-choice questions, as well as the computer intelligent marking of English composition, English translation and English blank filling. Meanwhile, for English composition, it can also effectively detect abnormal answers whose content is highly similar to the content of the test paper or the external model text. This system can not only provide a real English listening and speaking simulation test environment, but also automatically evaluate the examinee's voice after the test, and generate the diagnosis and analysis report of English listening and speaking level of district level, school level, class and individual students, so as to help teachers carry out targeted teaching, help students realize personalized learning, and improve students' English listening and speaking level.

Anyway, IFLYTEK's intelligent education product is an outstanding application of artificial intelligence, which effectively promotes the innovation of English education and teaching mode, and provides personalized, accurate and convenient service support for students, teachers and education management institutions.

#### 4. Survey of online English teaching during the outbreak of COVID-19

The data in the following tables are modified and translated from the survey designed by my colleague Prof. Liu Jun and done online by the teachers of my office in the second semester in the late 2019. And the subjects are the fresh students of Shanghai Publishing and Printing College, with a valid number of 982 students. The items of the survey include the following seven parts: Tools for online teaching, online autonomous learning resources, content of online teaching, online teaching methods, amount of homework, teaching assignment content, and online teaching vs traditional classroom teaching.

*Table 1 Tools for online teaching*

Tools	N	Percentage
Computer	169	17.21%
Mobile	138	14.05%
Combination of computer and mobile	665	67.72%
Others	10	1.02%

Table 1 illustrates that in online teaching, most of the students take their class through a combination of computer and mobile. Since computers can give the learner a clearer vision of the lecture and be more convenient to record the voices of the lecturer, the computer becomes a more favorable tool than the mobile.

*Table 2 Online autonomous learning resources*

Items	N	Percentage
Of teachers' self construction	87	8.86%
A combination of teachers' self building and using existing online resources	772	78.62%
Using all existing online resources	122	12.42%
Others	1	0.1%

Table 2 reveals to the reader that there are various online autonomous learning resources and the learner tends to select a combination of resources of teachers' self building and existing online resources.

*Table 3 Content of online teaching*

Items	N	Percentage
Teaching materials and supporting resources	876	89.21%
Supplementary language knowledge	521	53.05%
To supplement the contents of comprehensively improving literacy (such as patriotism, ecology)	372	37.88%
Others	7	0.71%

Table 3 shows that most of the students can finish reading the online teaching materials and

supporting resources, a considerable number of them tend to read more supplementary language knowledge, and some (37.88%) of them even like to read more comprehensive material such as patriotism, ecology, and the like, which embodies the spirit of the times.

*Table 4 Online teaching methods*

Items	N	Percentage
Students' autonomous learning mainly	133	13.54%
Teachers' live broadcast mainly	73	7.43%
Online interaction between teachers and students	190	19.35%
Combination of students' autonomous learning and teachers' live broadcast and online interaction	583	59.37%
Others	3	0.31%

Table 4 indicates that online teaching methods are more colorful compared with the traditional classroom teaching methods. The students can interact online with teachers and students simultaneously, or they can do their own study after class freely.

*Table 5 Amount of homework*

Items	N	Percentage
Too much	121	12.32%
Fairly good	842	85.74%
Too little	17	1.73%
none	2	0.2%

Table 5 proves that the amount of homework online is fairly good to most students, whereas the online assignments may appear to be a lot, the students can still be quite efficient in finishing them online.

*Table 6 Teaching assignment content*

Items	N	Percentage
To be more interesting	597	60.79%
To be major relevant	527	53.67%
Exercises in the textbook to be enough	307	31.26%
Others	26	2.65%

Table 6 tells the reader that a majority of students feel online classes are more interesting than the traditional ones, and can be more relevant to their majors. However, 31.26% of them still feel it to be enough to just finish the exercises in the textbook, which may be due to their laziness or their poorness in study.

*Table 7 Online teaching vs traditional classroom teaching*

Items	N	Percentage
Preferring Online teaching	95	9.67%
Preferring classroom teaching	393	40.02%
Combination of the two	357	36.35%
Preferring both	118	12.02%
Preferring neither	19	1.93%

Table 7 indicates that despite the various advantages of online class, only 9.67% of the students prefer to take them, while 40.02% of them prefer traditional classroom teaching better. This is thought-provoking, which may mean that the student are to be more aware of the benefits of taking online class on the one hand, and it may show that those vocational college students learner autonomy is to be improved. Furthermore, the low preference of the students' to taking online class may also persist in the inadequateness of the domestic smart English teaching platform.

## 5. Conclusion

Some conclusions may be drawn from the survey: For one thing, there various benefits from taking online class for the students, such as rich tools for online teaching, abundant online autonomous learning resources, interesting online teaching content, interactive online teaching methods, suitable amount of homework, and teaching assignment content relevant to the major of the students. For another, owing to the factors of the students and the online teaching platform itself, most of the

students prefer traditional classroom teaching better rather than the online teaching.

As can be seen from the above survey, China's domestic smart English teaching platform is still in the exploration stage, mainly developed by a few excellent private enterprises to supply commercial services mainly including Basic English teaching resources, evaluation and other functions. At present, both the platform system and its smart app still play an auxiliary role in teaching. Hence the leading role of teachers can not be replaced. Teachers need to make and prepare teaching plans through the platform. For the feedback evaluation of the platform, teachers still need to deal with the feedback comprehensively. The integration of artificial intelligence, big data and internet education will promote the rapid development of smart education platform, and solve the shortcomings of the existing smart education platform. For example, the smart teaching platform system and app have not yet established virtual tutors, which can not provide adequate interaction with students, and the human-computer collaborative environment for Internet group learning needs to be developed.

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