The Application of Cloud Computing in College English Teaching

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Abstract: In the era of Internet linking everything, education faces all-round multi-dimensional challenges and opportunities. In order to utilize the advantages of technology, college English educators should extend the traditional classroom aided by big data and Cloud computing in education. Cloud computing is emerging as a powerful computing paradigm with its aim of efficient resource utilization, providing a new solution for online English teaching and learning. With specific teaching targets of college English, the pre-class, in-class and after-class teaching phases aided by Cloud computing are presented, which aims to provide inspiration for educators, administrators and learners.

1. Background
Technology generates itself every moment with advantages and disadvantages; thus, the era brings new tasks for education. Big data and Cloud computing are intertwined together. In order to apply the state-of-art technology in college English, it is necessary to introduce big data. Big data is the idea that we can do with a vast amount of data collection, sourcing and analyzing with modern information memory and processing devices and technologies. The change in data scale leads to a change in data state, which Cloud computing plays a significant role with big data. Cloud computing with big data shifts the nature of business, how government works and the way people live, from charity to education. Data is becoming the raw materials of the information age, which is like the brick to a skyscraper. We must understand the meaning of data because society is expressed in a data format, from our friendships (as WeChat) to our whispers (as many social apps). Taking English teaching as the study case, big data can provide a breakthrough as the foundation of English teaching reform.

In the process of rapid development of modern technology, to promote the construction of Digital China and the modernization of the economy, it is necessary to rely on various innovations of the big data era to facilitate Chinese hi-tech comprehensive network. Moreover, the big data driven by Internet+ has had a great impact on college English education. As a result, we need to accurately grasp the new characteristics of college English education driven by big data facing the new challenges of college English education in the context of big data. Meanwhile, we must study the strategy of college English teaching reform driven by big data. This is positively helpful for improving the efficiency of college English teaching in China and ensuring the teaching effect.

Cloud computing is the idea that we can do with a vast amount of data collecting, sourcing, memorizing and sharing with modern information memory and processing devices and technologies. The change in data scale leads to a change in data memory and application. It shifts the nature of education, how colleges and universities work and the way teachers teach. We must understand the meaning of data because everything even everybody is expressed in a data format that never were
before, from our friendships (as WeChat) to our whispers (as many social apps). Taking the English teaching as the study case, Cloud computing with big data can provide a breakthrough as the foundation of English teaching reform. The more data collected and crunched, the more extraordinary sharing can be done, which relieves the inequality of resource allocation and lack of teaching variety. For college talents cultivation, English teaching plays a significant role. With big data combined with Cloud computing, college English teaching breaks its boundary of classroom, extending the education activities without time limitation.

2. Introduction to Cloud Computing in College English Teaching

As educational technology facilitates higher education, many universities and colleges are turning to Cloud-hosted learning management systems that connect student databases with learning content. Cloud computing is also a viable option for numerical modeling, data sourcing and memory, and visualization, facilitating collaboration with other users. Cloud computing is relatively a cost-effective and affordable resource that enables fast processing, large data-storage capacity, and the sharing of resources. It offers users, including teachers, students and administrators, flexibility, convenience of data management, repeat-ability.

As IBM presented on its website, it generally categorizes Cloud computing into four types, which are SaaS (Software-as-a-Service), PaaS (Platform-as-a-Service), IaaS (Infrastructure-as-a-Service), and Serverless computing. For the features shown in Picture 1.

![Picture 1](From IBM Website) [1]

There are many Cloud server like IBM, which provide options for users. Here comes the next issue ---- how the Cloud is solving challenges in education? As presented in Picture 1, the IaaS and SaaS service models with scalability and elasticity are a perfect fit for addressing the trends and challenges in higher education. College English teachers and administrators can foster a unique culture of collaboration across faculty, students, and administrative staff. Today, many institutions of higher education have moved, or are in the process of moving, their administration systems to the Cloud, and have adopted Cloud-based collaboration systems to enhance the sharing of information across campus.

3. The Necessity of Cloud Computing in College English Teaching

Cloud computing is live-demand access, via the internet, to computing resources, including applications, web servers (physical servers and virtual servers), data storage, evaluation tools, etc.—existed at a remote data collection. Compared to traditional digital interaction, Cloud computing realize the following targets. Lower digital exchange costs, since Cloud removes the need for building new on-premises infrastructure and provides various resources. Second, Cloud computing can improve agility and time-to-value, as organizations or institutions can start using information
exchange simultaneously, instead of waiting days or weeks for the message receivers to respond to a request, purchase and questions etc. Scale the range of information exchange more easily and cost-effectively, as Cloud provides elasticity, while users shift capacity up and down in response to spikes and dips in traffic. You can also take advantage of your Cloud provider’s global network (like IBM, Baidu Cloud, etc.) to communicate your applications closer to users around the world. The term “Cloud computing” also refers to the technological approach that makes Cloud work, which includes certain virtual IT infrastructure. Virtual technology enables Cloud providers and users to make use of their data center resources at large. Not surprisingly, many corporations and universities have adopted the Cloud delivery model for their administration and education, so they can realize maximum utilization and cost savings, while the traditional IT infrastructure couldn’t. If anyone uses a computer or portable smart devices at home or at work, he or she uses some form of Cloud computing every day, whether it’s a Cloud application like Baidu Cloud, IBM Cloud, streaming media like Tik Tok, or social media like WeChat, etc. According to a recent survey, over half of organizations in China use Cloud today, most of whom plan to use it more within the next year.

University students are the most highly-networked and connected populations among 18-24 years old. According to a recent study, university students bring 1-3 smart devices to campus and expect to use them all seamlessly across university to get learning contents and do social connection, etc. In almost all the circumstances, the Cloud provides the possibility to meet those expectations. Cloud computing in education allows universities to cost-effectively upgrade teaching and learning systems without massive capital investments in infrastructure. Accompanied with popularization of portable smart devices, the limitation of time and space in learning for students becomes less, as Cloud computing in education facilitates students’ study and improve students’ self-study competence.[2]

Cloud computing in education represents a major conceptual shift that introduces new elements in designing teaching models and study environments that are not probable in traditional classrooms. Many scholars pointed out that learners’ factors reflect concern of study. If learners are concerned with English study, the focus and curiosity of them can improve the learning result. The evolution of Cloud Computing motivates Cloud Computing in college English teaching reform, aiming to help students gain broad exposure to the main body of knowledge from Cloud. There is thus a strong need for having a Cloud Computing College English course that has a broad coverage of different roles (teachers, students and administrators) interacting through accessing to Cloud. In this paper, the demand for understanding the impact of Cloud Computing in college English teaching is described, which proposes education strategies for teaching college English. In addition, Cloud computing in education provides interesting teaching situations for students to solve English problems, with interactive study mode.[3]

4. The Application of Cloud Computing in College English Teaching

The extensive research on Cloud computing focuses more on technical aspects like security, quality, efficiency etc. However, the research on adoption of Cloud computing in college English teaching is at its infancy stage. It is reasonable that the application of Cloud computing in college English teaching be divided into three phases: pre-class phase, in-class phase and after-class phase.

4.1 Pre-class Phase

Chomsky, the linguistic scholar stressed the importance that the human brain mechanisms of language learning have close relationship of learners’ subjective factors and emotional factors, especially in foreign language learning.[4] Compared to the traditional English teaching in classrooms, the preview with Cloud computing is relatively attractive and content-rich. The good old days of reciting new words by students proved to be feeble and noneffective, with the enormous fun tools spreading on the smart devices. The one-orientation teaching targets of the college English ten years ago have been adjusted to the multi-disciplinary study of trends in multiple perspectives. The Internet+ age or Internet of everything era have brought brand new requirements for Chinese talents with foreign linguistic skills. The mass data of various English materials can inspire students’ interests in language
learning, while on the other hand it also is a risk to lose some students’ patience, especially for those with poor language competence. The proper arrangement of the teaching procedure plays a significant role in college English teaching.

The preview of English teaching contents should be emphasized in the process of applying Cloud computing. Thus, most in-class troubles can be relieved and solved easily. The pre-class activities should be designed systematically and published through Cloud computing, which also requires that the students improve their self-study ability. The self-study ability to collect and research for the mass data significantly influences the students’ preview gain. In order to remove the gap of different preview preparation of students, the Cloud computing in college English should collect and record students’ performance at every step of language learning. The Cloud-aided college English teaching can customize the language sources for different students which ease the anxiety of English learners. Teachers can select and categorize the preview sources through the Cloud, covering global cultural backgrounds, the profile of famous writers, the grammar exercises, and passage structure building, etc., which are open options for students.

The way students apply the Cloud computing in college English learning is closely attached to the teaching design. Teachers can read students logging in time, exercise time, blank time, which are recorded and uploaded to Cloud computing the moment students practice on the study platform. The big data works as the simultaneous surveillance on students learning. The preview design helps both students and teachers prepare for the new English teaching contents. Especially for the students’ part, when they do the online and offline pre-class study, they should get familiar with the smart device operation and the study platform, and thus they can gain satisfactory study result. For the teachers, after the target students finished the preview online, teachers should check the evaluation of students’ pre-class activities and rearrange the in-class teaching contents, which can optimize the teaching effect.

4.2 In-class Phase

British education experts Harmer (2000) pointed out that the success of three fundamental components of classroom teaching lies in engage (put into), learn (study) and activate (use). Language learners have the determining right of whether positive input is devoted, which is a necessary prerequisite for effective learning. It suggests foreign language teaching should focus on characteristics of language learners, especially their psychological state in linguistic acquisition. Needs analysis or demand assessment theory also emphasizes the idea of learners’ factors in foreign language teaching and learning, which was originated from Abraham H. Maslow (1943). Demand analysis model claims English teaching should meet the learners’ need of communication in the future. Cloud computing in education can not only satisfy different needs of college English learners but also transform the classroom experience. Cloud computing in college English teaching provides technology benefits for universities, including the administrators, teachers and the students they serve, to reap all the advantages of Cloud computing, such as scalability and elasticity.

For traditional English classes, to a great extent, teacher-centered teaching design and information instillation turning a language class into a knowledge presentation. It is still very common in the English classroom that the teacher explains every language point in detail, while students take notes all the time. For the test-oriented education, the teaching goals are not student-centered. While, the Cloud computing in college English teaching can brings vitality for online and offline linguistic study. There are majorly five improvements in college English education with the aid of Cloud computing. First, as MOOC, SPOC or other online classes open on Moodle, students can get reach to more diverse English resources. Secondly, for in-class English learning materials, it is popular to reduce the use of textbooks replaced by digital contents from the Cloud. The cost of learning materials is saved by Cloud-based textbooks, which benefits all the learners, especially those from low-income families. The cost-effective college English learning material relieve the financial burden of poor students and balance the equality for linguistic education. Thirdly, no more out-of-date learning materials exist in modern college English teaching design. Dated back to 1990s, the world linguistic map changed a lot,
which calls for the generation of English learning contents. The expensive English materials stay as the block for many English learners; thus, Cloud computing can be a perfect solution to the stubborn problem. So, students can always have access to the state-of-art technology and knowledge from Cloud. The fourth advantage for college in-class English teaching is the cost reduction for universities, which is closely related to less demand for expensive hardware. As is illustrated in the IBM Cloud model, Cloud-based applications can be operated on Internet platforms and websites, and can be compatible with portable smart devices as well. For students, it is not necessary to buy extra devices, as the smart devices for fun is also accessible for study. Last but not least, with the faster regeneration of technology, software becomes available at low cost or for free. As in Cloud-based computing, software-as-a-service (SaaS) model makes it possible, which substantially lowers the spending of essential apps or software for students.

What’s most important is the boundary of college English teaching and learning is broken. Teachers can publish online study project in a café, or monitor students’ exercises in school library. Students can get access to the learning contents anytime, anywhere at any device, which is more user-friendly-designed. For the absent student, the online open course can remove the distance gap with 24-hour live access to the given materials.

In all perspectives of education, Cloud computing is more efficient, which can reduce costs and create open classes without the limitation of space and time, providing equal opportunities to all the learners and balancing the gap for the poor region.

4.3 After-class Phase
The follow-up procedures of English classes outside of classrooms focus on evaluation and response of students’ performance. In traditional classes, with the end of class periods, all the teaching activities are paused, which left the unsatisfactory teaching effect. The unsolved issues and the unknown puzzles remain the same as before, while the students may feel frustrated in learning next lesson. For the teachers, it is quite difficult to judge whether the students have perceived the contents and reached positive response, under the distance between the teachers and students. The record of class is not available for teachers to analyze, so that the adjustment of the following teaching plan cannot be made. The communicative channel of traditional college English classes is the classroom from teacher to students, while no additional medias can facilitate the communicative process.

In comparison, for taking Cloud computing in college English teaching, the end of in-class study does not stop the learning of students. With unsolved problems and difficult points for students, they can ask for help from the Cloud computing, downloading the related customized information to learn more. The achievements of learning can relieve the anxiety of students and improve their interests and curiosity for next lesson. The no-boundary college English classes can remove the obstacle of distance, providing the channel to questions and answers between teachers and students. Teachers can also redesign the following teaching plan based on the previous in-class performance of students, which can optimize the teaching effect and fulfill the teaching targets. The evaluation does not only remain on classes but also extend to 24 hours a day, 7 days a week.

For the advanced learners in one average level class, they can search for personalized materials from Cloud, so that they can increase the variety and the difficulty of learning. But in traditional English classes the embarrassment of balance between excellent learner and poor learner make it impossible to satisfy all the class. The aid of Cloud computing can just meet the needs of different learners with different English competence.

The benefits of Cloud computing are being recognized in educational institutions across countries, with almost 90 percent of top universities currently using Cloud-based application. The immediate benefits of Cloud computing are obvious: Cloud-based applications reduce infrastructure and IT costs, increase accessibility, enable collaboration, and allow organizations more flexibility in customizing their services both for teachers and students.
5. Summary
As educational technology like big data and cloud computing facilitates higher education, many universities and colleges are turning to Cloud-hosted teaching management systems that meet students’ study needs. Cloud computing is also a viable option for numerical modeling, data sourcing and memory, and visualization, facilitating collaboration with administrators, teachers and students. Cloud computing is relatively a cost-effective and affordable resource that enables fast processing, large data-storage capacity, and the sharing of resources. It offers teachers, students and administrators flexibility, convenience of data management, repeat-ability.

The pre-class activities require that the students improve their self-study ability and the teachers should design and publish teaching materials through Cloud computing. With the aid of big data and Cloud computing, the students’ preview effect would be more efficient compared to traditional learning. In order to remove the gap of different preview needs of students, the Cloud computing in college English should provide the contents based on the record of students’ performance at every step of language learning. The Cloud-aided college English teaching can customize the language sources for different students which ease the anxiety of English learners.

Cloud computing in education represents a major conceptual shift that introduces new ideas in designing teaching plan and study environments. In designing and applying process, teachers should take learners’ factors into consideration. The evolution of Cloud Computing motivates Cloud Computing in college English teaching reform, aiming to help students gain broad exposure to the main body of knowledge from Cloud.

As the most advantageous edge of Cloud computing in college English, the evaluation on students’ performance is more scientifically done. With unsolved problems and difficult points for students, they utilize the help from Cloud computing, downloading the related customized information. The achievements of learning can relieve the anxiety of students and improve their interests and curiosity for next lesson. The no-boundary college English classes can remove the obstacle of distance, providing the channel to better solutions of education.

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