

Solutions on Obstacles of Applying Educational Technologies in Chinese Primary and Middle School English Classrooms

Haoyang Yu

NYU Steinhardt, Department of Teaching and Learning, 239 Greene Street, 6th Floor, New York, NY10003, United States

yhyang1995@163.com

Key Words: educational technology, obstacles, digital literacy, in-service teacher training, the large class size.

Abstract. With the development of audio-visual education researches, researchers and educators have revealed advantages of applying technologies for educational purposes. Digital applications and tools are also developed to play positive roles in classrooms. Nonetheless, there are still obstacles impeding the further development of educational technologies. This paper tries to discuss three common concerns by reviewing previous researches and articles, which are: 1) the lack of qualified teachers mastering both teaching and computer skills, 2) students' less developed digital literacy in their early stages, 3) a long-lasting problem of extremely large class size. This article also tends to provide solutions of the three common accepted obstacles, aiming at the students' early digital literacy development, trainings about education technology on in-service teachers, policies on solving the large class size problem and how could introductions of educational technologies be carried out during that process.

1. Introduction

After the generation of CD-ROMs, tape recordings and physical models in 1980s [1], integration of prior technologies, such as artificial intelligence, big data, virtual reality and augmented reality have greatly improved the productivity in varied fields of education and training, like surgery, engineering and military. As for EFL, new ideas and theories are brought out and policies are made to guarantee the development of those technologies.

In China, the 13th Five-Year Plan for the Development of National Education pointed out the next stage target as promoting the integration of informational technology and education, covering broadband network and network teaching environment in schools of all levels and districts, and encouraging qualified schools to allocate teaching devices for teachers and students. Meanwhile, according to the Development Planning of New Generation Artificial Intelligence, Chinese government claimed that intelligent technology would be used to accelerate the reforming of training and teaching method. The whole process of teaching, educational management and resource construction would be promoted, including an online platform based on Big Data, an intelligent, fast and comprehensive educational analysis system, and a learner-centered education environment with precise push service and customization of daily and lifelong education [2].

Due to the investment and research of these years, Chinese researchers and educators have revealed and accepted the convenience, motivating and engaging aspects of educational technologies. Many tools which proved to be successful abroad were applied in primary and middle schools in a large scale, such as interactive white board and in-campus messengers [3]. Moreover, with united textbooks facing the national high school and college enrollment exams, schools and publishers could concentrate on recording and uploading matched visual and listening materials and sample lesson plans. Some schools are also qualified to establish specific test question storage and exam system on school LAN. Also, attempts of social media are introduced. Together with blog and wiki, using social media for educational purposes has broad implications for education delivery and student engagement in the classroom [4], and in China, educators also attempted to apply specifically social media apps. For example, a design of inverted classroom based on Wechat platform was proved to be feasible in medical English reading [5], in which handouts, videos and subsidiary reading materials are provided

before class on a Wechat official account (an account for organizations to push articles and videos), and students also discuss with each other and teachers in Wechat groups. Moreover, for students eager on self-learning, mobile learning applications have become popular choices for them to use time fragments. At present, vocabulary memorizing apps have already established a mature market. One typical vocabulary memorizing app is BaiCiZhan, through which students estimate the meaning of pictures and match the pictures with words and sample sentences to learn [6]. The learning process would also be recorded and reviewed based on the Ebbinghaus curve.

Researchers affirmed the effect carried by those existing educational technologies, but present researches also predicted a significant reform of language learning process supported by artificial intelligence. Based on new tools and resources, an intelligent learner-centered environment can recognize individual learning requirement, then accurately push multimedia resources based on analyzing personal interests and record learning process. For learners need communications, they will also feel easier to contact with other similar learners and specific teachers in the cloud. Assessment will also no longer carried out after certain learning periods. Learners will receive real-time feedback and individual evaluation, breaking traditional evaluation system most based on exam papers.

2. Obstacles of further development of educational technologies based on traditional school management

Although Chinese researchers and government have already realized the grand advantages of technology integrated classes, some obstacles due to traditional Chinese educational ideas and management have been revealed, affecting further applying of educational technologies in language classrooms.

One obstacle is the belief that China has a lack of qualified teachers who are both good at language teaching and computing. Surveys upon teachers' and students' experience and opinion towards CALL reported a widespread unfamiliarity with computers among in-service teachers, who claim the need of training about dealing with technical problems [7]. For pre-service teachers, normal school graduate students majoring in educational technology prefer occupations of developing educational applications in schools, companies and government departments [8]. However, in most cases positions offered by primary and middle schools are only computer teachers, which strictly limited their specialties. On the other hand, though local Ministry of Education and relevant companies may provide training courses, but contents and organizations of the courses are usually diverging from real need and practices in teaching. School leaderships may also view them as merely computer operation training, making participants less possible to gain a systematic understanding of educational technologies.

Students also face the problem on computer literacy, lacking trainings on operating digital devices before they really start using those devices rapidly in an effect-oriented circumstance. In all levels of elementary school, middle school and high school period, students have a subsidiary course of information technology through which they learn how to operate computers and practice basic office software like Word or PowerPoint. Usually in all stages, students have 45 minutes or 1.5 hours per week. However, since computer literacy is not directly relevant to scores of high school or college enrollment exams, students treat information technology classes with more indifference, and students playing computer games in those classes have become very common. Also, for students of middle school or above, printed textbooks and practices are still mainstream, making students feel more comfortable to read printed materials and write on paper. In the interview of students using vocabulary memorizing apps, some interviewees claimed that they 'cannot get the feel of learning', making them easier distracted by entertaining apps on their mobile phones.

Another obstacle, also one major reason of teachers failing to prevent students from being distracted by computer games or mobile devices in classes, is the traditional large class size. Cui and Wu in an investigation of Chinese middle school class size reported that over 25% middle school students in China are put in classes that may contain 56 students or more [9]. Even though efforts have been made aiming at class size problem, most classes still contain over 30 students in public schools. In those classes, teachers cannot ask questions and receive feedbacks from every single

student in a single class. Students also claimed that they cannot resist playing games or watching video shows in classes [7], which is less likely to get controlled due to the management pressure. Moreover, traditional teacher-centered ideas may also cause school managers to use extreme method to control students, like a complete prohibition of electronic devices in campus. For reasons like preventing children from radiations produced by mobile phones and computers, Chinese parents tend to not purchase those devices for their children until college. The prohibitions may also encourage those thoughts, making students less familiar with technologies in early learnings.

3. Solutions

According to American Association of School Librarians, digital literacy, as an important feature of 21st century adolescents, is described as the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills [10]. In other fields other than language learning, such as programming, apps like Lightbot Jr and Scratch Jr had already been developed for children aged 5-8 for rudimentary programming knowledge. As for English learning in China, apps containing visuals, recordings and games could also be helpful even from alphabet and phonics period, which is usually the first stage of English classes for children in China. Such apps may contain various visual and listening materials for children to discover with guidance of parents, practice spelling and sounds by easy games, and communicate with teachers online for further correction. Through this process children are better prepared for more advanced technical skills they may face at school. Since the temptation of games and shows are more irresistible than previous long, boring and irrelevant computer classes [7], better designed multimodal apps would be closer to the teaching tool students are expecting, which would release the management pressure teachers face due to the class size problem.

Even though effective trainings still lack, some companies have already introduced technologies like electronic whiteboard, projectors or in-campus messengers, which have been widely applied in urban middle schools. These technologies greatly helped classroom managements and cut down inconveniences of traditional blackboards and chalks. Based on those previous successes, it will be more convenient to introduce further digital management systems. Though some of the technologies are only designed to fit small-sized classes, teachers could take advantages on class committee system which has been totally mature in China. Students willing to offer helps could take part of class management work by getting accesses from teachers. For teaching activities, teachers still also need to become aware of specific usages of technologies aiming at English classrooms. Researches in Canada found that students feel engaged in digital literacy activities such as storyboards and video making sequencing in a documentary story [11], and in China there are also similar social media apps like Wechat and Tiktok. Since those apps are nationally popular, applying them as a part of courses requires less time on instructions, and students familiar with those technologies would also be willing to develop such talents. For the students who are less trained on digital skills, they can receive guidance from other students, teachers and even their parents to gradually catch up with general digital proficiency level of the whole class. In such cases, teachers also need to play a role as cheerleaders by explaining to students how those technologies work with their school works and providing positive feedbacks for both students and parents.

According to Cui and Wu's survey, in different districts, the influences of class sizes on students' academic performances are also distinct, so measures of applying technologies also need to be different [9]. Statistically, in municipalities and provincial capitals, class sizes could be well controlled because of the sufficient and balanced development of education. Parents would also like to attach importance to students' personality development and attentions they received from teachers. In that case, reforming classrooms and course designing with technologies would be less difficult on the aspect of receiving students' feedbacks and monitoring their behaviors on the devices. On the other hand, in less developed prefecture-level and country-level cities, economic growth cannot meet the need of education requirement, so educational resources are centralized in cities and students of higher scores in enrollments tests are also gathered in limited schools, in which class sizes are extremely large, but students' academic performances are better than other schools with smaller class

sizes. Researchers suggest the government to increase specific funds inclining on rural schools to balance the centralization of educational resources, while urban schools could still develop as expectation. More concrete measures include compounding teacher system by asking teachers from schools in advance to help developing rural schools to improve teaching quality. In such cases, the experience of applying educational technologies also passes through different schools, together with the general development of digital literacy of both students and teachers in communities, and introducing digital management tools will also release the management pressure, helping the process of class size reforming to be carried out more smoothly. Therefore, present trainings could focus more on urban schools and devices could be provided during the process of teachers' moving.

4. Summary

Barriers of widely applying educational technologies in Chinese primary and middle schools have been revealed. However, since researchers and teachers have already admitted the convenience and efficiency of educational technologies, and government also issued continuous policies to support [2], I believe the widely applying of educational technologies in China has an excellent prospect.

Solving the obstacles of the lack of teachers' computer skill and students' practice on digital literacies, and the long-lasting problem of large class size needs collaboration of the whole society. To prepare students for a technology-based classroom, they need practices in their early period. Referring to early programming mobile games aiming at pre-school children, schools and language institutions could develop applications on tablet devices and mobile phones helping children with early multimodal and digital literacy practices. Secondly, for teachers' computer skill, the problem is more about the lack of trainings with contents beyond middle school level computer class for in-service teachers. However, teachers themselves also need to be aware of the convenience of using some common technologies and social medias in their classes. Thirdly, the class size problem has been existed for a long time, and it still needs a long time to solve, but during that process, educators need to clarify the needs of educational technologies in different locations, and trainings in educational resources centralized schools will also influence teachers in less-developed districts with the moving of teachers required by policies.

Despite the positive future, accepting technologies in classrooms also needs proper guidance, otherwise the purpose using technologies may become inappositely extreme. On September, several pictures about school using AI to monitor in-class student behaviors led to heated discussion on Weibo, a common social networking application in China. Also, same cases occurred in Jiangsu province. In a local primary school, students wear a ring-shaped device on head to monitor their brain wave, which will be shown on screens for teachers to judge if they are distracted and to provide feedback to students and parents. Public argue that such systems make students feared about being monitored rather than being attracted by and concentrate on teachers and lessons. In such cases, advanced technologies are introduced to schools but they are abused under the boundary of some extreme beliefs requiring students to keep completely concentrated in classes, and behaviors like drinking water or not sitting still may be viewed as signals of students not paying attention to classes. Present society requires different skills of students, so we need to concern about reforming our teaching and learning process. Therefore, future researches need to pay attention to students' cognitive, interpersonal and intrapersonal development besides technical skills [12], and the ideology of managing educational technologies to prevent technologies from being abused, and to help students to better adapt to the 21 century society.

References

- [1] Zhuang Zhixiang, Huang Wei and Wang Le, Current Situation and Outlook of Chinese Multimedia Teaching. *Computer-assisted Foreign Language Education*, vol. 01, pp. 21-28, 2007.
- [2] China government, Development Plan of New-generation Artificial Intelligence. http://www.gov.cn/zhengce/content/2017-07/20/content_5211996.htm, 2017.

- [3] Prinsloo M and Sasman F, Literacy and Language Teaching and Learning with Interactive Whiteboards in Early Schooling, *TESOL Quarterly*, vol. 49, pp. 533-554, 2015.
- [4] Darrell M. West, Digital Schools: How Technology Can Transform Education, pp: 33-43, 2012.
- [5] Jia Lingyu and Zhang Guoying, Design and Practice of an Inverted Classroom of Medical English Reading Based on WeChat Platform and Community, *Computer-assisted Foreign Language Education*, vol. 168, pp. 65-69, 34, 2016.
- [6] Cao Jin and Deng Xiangjiao, Research of College Students Using “Baicizhan” to learn English Vocabulary under a Mobile Learning View, *Computer-assisted Foreign Language Education*, vol.187, 2019.
- [7] Wang Jianli, Teachers Changing Role in Computer Assisted Language Learning in Higher Education in China, *International Journal of e-Education, e-Business, e-Management and e-Learning*, vol. 2, 2012.
- [8] Liu Hehai and Rao Hong, Development of Educational Technology Major in Chinese Normal Schools: Current Situation and Introspection, *China Educational Technology*, vol.341, pp. 37-47, 2015.
- [9] Cui Sheng and Wu Qiuxiang, How Class Size Influence Middle-school Students’ Academic Performance: Empirical Research Based on Tracing Investigation of Chinese Education, *Journal of The Chinese Society of Education*, vol. 3, pp. 28-35, 2019.
- [10] Li Yi, He Shawei and Qiu Lanhuan et al, Current Research and Enlightenment on Digital Literacy of North American Students, *China Educational Technology*, vol. 379, 2018.
- [11] Toohey Kelleen, Dagenais Diane, Fodor Andreea et al, “That Sounds So Cooool”: Entanglements of Children Digital Tools and Literacy Practices, *TESOL Quarterly*, vol. 9, pp. 461-485, 2015.
- [12] Woolf Beverly, Lane H., Chaudhri Vinay, Kolodner Janet, AI Grand Challenges for Education, *AI Magazine*, vol. 34, pp. 66-84, 2013.