

From practice

A Climate education to Chinese adult learners in an English class with a project based learning method

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The study reports the author's innovation of teaching climate education to adult learners in an English class using project-based learning (PBL). Over a whole semester in 2022, six topics related to climate change were taught and learned in a core curriculum tertiary English class in China. At the end of the semester, data showed a high level of English language learning achievements indicating the benefits of using problem-based learning with adults. Data collected from an online discussion forum and subsequent learner interviews show that climate education included within an English class does encourage learners to pay much closer attention to a number of dimensions of the social issue of climate change, and indicates learner willingness to act to combat climate change

Keywords: *climate education, English class, adult learner, project based learning*

Introduction

Taking urgent action to combat climate change and its impacts is one of the Sustainable Development Goals released by the United Nations (2015). As one of the influential countries, China has undertaken to actively combat climate change. Some important laws related to climate education have been released by Chinese governments, such as Education Law of the People's Republic of China (NPC, 1995) and Higher Education Law of the People's Republic of China (NPC, 1998), both of which highlight the vital role of education in combating climate change. Several universities in China have explored the methods or strategies for combating climate change, including Tsinghua University's "one principle and three dimensions" strategies (Zhao & Zou, 2015; 2018), and Tongji University's Tongji Manifesto (Lu & Zhang, 2014; Yuan et al., 2013). Many studies have evaluated the effectiveness of green universities in China from diverse aspects. Niu et al. (2010) analyses and examines the laws and policies related to education for combating climate change. Geng et al. (2013), Yuan et al. (2013), Zhao and Zou (2015) describe Chinese universities' activities in combating climate change and analyse their social context.

Holm et al. (2015), Zhao and Zou (2018) and Zou et al. (2015) conducted comparative studies on sustainable development (especially the issue of climate change) among different levels of Chinese universities or universities in China and abroad. These studies indicate that China's green universities initiative pay attention to traditional formal education on combating climate change; while few studies have looked at adult education or continuing education (Yao, 2019a). Most universities have set up optional courses about climate education for students. However, in recent years, Chinese education department policy documents are decreasing the education burden (Chen, 2018). Optional courses have been cancelled in universities, including courses about climate education. In this context, how to embed the knowledge of climate education into the compulsory courses and cultivate the adult learners' knowledge of combating climate change is an urgent task for Chinese university teachers.

Introducing climate education in an English class with a project-based learning method

English is a compulsory course for both ordinary learners and adult learners in China from primary education to postgraduate education (Yao, 2019b; 2022). Learners' English performance determines their success or failure in accessing higher education. Therefore, teachers, learners and education departments in China dedicate a great deal of attention to English education. English courses are not influenced by the Chinese education department's "decreasing the education burden" policies. The author has been teaching English at Chinese universities for more than ten years. Based on his teaching experience he has formed his English teaching philosophy thus: English teaching is not only to help learners to improve their foreign language knowledge and skills but also assist learners to think about social and cultural issues. Therefore, it was valuable to trial embedding climate education into an English class in 2022.

The blended learning environment includes project-based learning, online learning, group-based peer learning and class-based face-to-face learning. An online learning platform is used to support online learning and peer learning where learners can access the learning materials, upload their assignments, take a quiz and check their performance (Yao, 2017, 2019). Using problem-based learning, a social issue is presented and discussed in English class. Learners engage in activities encouraging them to use the target language (English) to place themselves as analysts of real-life situations. In the semester from March 2022 to June 2022, the six topics were "introduction to climate change", "climate change and environment protection", "carbon release and climate change", "our daily life and climate change", "carbon neutral and our future", "our actions of combating climate change".

Sources of data for this analysis of practice are, the end of semester examination testing learners' English learning achievements, data collected from the course forum and a selection of 20 learner interviews. Learners' achievements related to climate education were analysed using the theory of Language-in-Use approach (Gee, 2011).

Discussion of learning outcomes

The final examination results reveal that problem-based learning (PBL) helps learners to improve their English abilities. All the 2022 learners passed the final examination; sixty-five percent of the learners gained a score greater than 80/100; thirty-five percent gained a score greater than 90/100. In follow up student interviews more than half expressed satisfaction with problem-based learning (PBL). Learner statements included, “it is very interesting to learn English with a PBL method”, “I can learn the ‘real’ language with PBL”, “the PBL helps me understand what I learned”, “with a PBL teaching method, rote learning is not necessary, which decreases my learning burden”. Problem-based learning can construct the language context for learners and help practice the target language in real life, which makes language learning interesting and effective. Maybe this is one of the most important reasons why a problem-based pedagogy can improve learners’ language acquisition. Also important is problem-based learning encourages learners to think about real-life social issues, such as climate change, which is consistent with the findings of Ochs (1988) and Vargas (2012). Their studies report that the acquisition of linguistic knowledge and the acquisition of sociocultural knowledge are interdependent, and language learning practice can enhance linguistic as well as social skills.

More than 800 comments about climate change and sustainable development collected from the online forum illustrate the learners’ attitudes towards climate change. Analysis of forum commentary using Gee’s (2011) language in use approach revealed that learners’ views can be divided broadly into the positions that (1) “we only have one earth”; (2) “our activities can hasten climate change or combat climate change”; (3) “it is the duty for every individual to combat climate change and I am right up at the front of the war against climate change”.

The opinion “we only have one earth” was commonly expressed. Indicative statements are, “we only have one home, which is the earth”, “our science cannot help us to find another place to live”, “if the earth is destroyed by us, where can we live?”, “for the reasons that our descendants can live as happily as us, please protect the environment and combat the climate change”. Learners expressed their views using the personal plural pronouns, such as “we” and “our”. Firstly, learners fully realise the significance of combating climate change. They

expressed understanding this is a vital time to take actions of combating global warming, as climate change will influence not only the current generation but also following generations. Secondly, learners know they are required to take part in fighting against climate change, as climate change has affected their lives, even will destroy their lives. Thirdly, they know that they do not speak only on behalf of themselves, expressing that it is society's duty rather than an individual's duty to take actions of combating the climate change.

Facing with the issue of climate change, learners regard human societies as an unseparated unity. Therefore, learners choose the pronouns "we" or "our" rather than "I" or "mine". A previous study (Pérez-Foguet, Lazzarini, Giné, et al., 2018) revealed that setting up courses about sustainable development can directly and effectively promote sustainability competences. This analysis reveals that a PBL teaching method in English class with an appropriate design can encourage learners to think about sustainable development issues and directly pay attention to combating climate change as well.

That "our activities can hasten climate change or combat climate change" was another important viewpoint expressed by learners. In the online forum, learners listed several actions that hasten climate change. Commonly noted viewpoints are, "burning coal especially in industry is one of the most reasons of climate change", "driving car increases the greenhouse gases and causes climate change", and "deforestation and desertification not only destroy natural environment but also increase the temperature". Learners also listed activities to prevent or decrease global warming. Statements included, "more clean energy rather than fossil energy should be used in industry", "it is better for us to develop the technology and produce more new energy vehicles instead of the diesel vehicles or gasoline vehicles", "it is not only my duty or your duty but our duties to protect forest and grassland", "a little action in environmental protection will flourish in combating climate change greatly".

In order to acknowledge the deep relationships between human activities and climate change, several learners went to the library to read academic papers. One learner investigated cattle raising and discussed means of reducing carbon dioxide in cow raising, such as optimizing cows' food, vaccinating cows, and editing cows' genes. With this kind of

discussion, learners acquire English expressions about climate change, and knowledges of global warming.

The opinion about the responsibility of combating climate change is the third theme learners expressed. In the forum learners stated that all individuals are required to be responsible for global warming and they themselves are required to contribute more towards combating climate change. Indicative statements included, “no one is behind the war of fighting against climate change”, “facing with the global issue, all nations are required to unite together”, “all governments, especially the governments in developed countries, have the duties to combat climate change and create friendly environments for their people”, “we have acquired the knowledge of combating climate change and we can be the pioneers in the war against global warming”, “the fight against climate change encourages me to work hard”. These expressions reveal that the learners have considered the responsibilities of combating climate change; they call for the governments to engage deeply in fighting against the global issue of climate change; and they are willing to contribute. A study by Dunlop, & Rushton (2022) reported an absence of governmental responsibility and attention to the political dimensions of climate change. This was recognized by learners in this English course. Governments are required to pay more attention to combating climate change and developing sustainably.

At the end of the semester, the author interviewed 20 learners about the issue of climate change. Seventeen learners told the author that they had heard about climate change but were not clear about the issue before the class; another three did not know about the issue prior to the class. All of them now know the significance of combating climate change after taking the course. All learners interviewed said they would take actions in combating climate change, such as taking public transportation, driving new energy vehicles, attending the activities of planting trees. Eighteen learners expressed that they would invite their family or friends to attend the activities of combating climate change. From the collected data, the conclusions are that appropriately designed problem-based teaching and learning in an English class is effective in enhancing both language learning and knowledge of a chosen social issue. Introducing climate change as a focus of study within the core curriculum of English at tertiary level draws learners’ attention to global

warming and inspires them to consider their individual and collective roles in combating climate change.

Conclusion

Combating climate change is one of the United Nations Sustainable Development Goals. The story of practice introduces the author's innovation in including climate education within an English class, drawing on the pedagogical benefits of using a problem-based learning with adults in a tertiary setting in China. The finding will shed light on climate education. However, this study takes English teaching in China as an example, whether the experience of climate education with a PBL teaching method in an English class meets the requirement of the climate education in other countries, is still unclear. Possible cooperative partners for future studies exploring the methods of climate education in different countries and districts could be a means for comparing findings and establishing best practices for adult learning.

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