

How a blended learning environment in adult education promotes sustainable development in China

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The study adopts a semi-structured survey to examine the effects of a blended learning environment in adult education in promoting sustainable development. The study analyses the development of blended learning environments in China, and some challenges that China faces in sustainable development. Based on the analysis results, the study revealed that a blended learning environment could promote adult education development, reduce the development inequality between genders and geographically, as well as protect natural environments. A survey to adult learners verifies the aforementioned conclusion. Adult learners believe that a blended learning environment is an eco-friendly learning environment; it increases the opportunities for females and those living in rural areas to become educated and promotes their sustainable development. The research results may be beneficial for education policy makers and practitioners interested in sustainable development.

Keywords: sustainable development, equality development, adult education, China

Introduction

Terms such as ‘sustainable development’ and ‘sustainability’ attracted more and more attention after the Brundtland Commission delivered its report entitled *Our common future*. Sustainable development aims to promote current development as well as preserving resources for long-term growth (Kuhn & Deetz, 2008), which are usually defined as ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’ (World Commission on Environment and Sustainable Development, 1987). The early part of this decade saw increased political will in promoting sustainable development. The Millennium Development Goals (United Nations, 2000) set a broad mandate for international development between the years of 2000 to 2015. It added political impetus to the argument that there cannot be sustainable progress towards the achievement of development goals without active and critically aware citizens. From the legacy of the Millennium Development Goals, the 2030 agenda (also known as *Transforming our world: The 2030 agenda for sustainable development*) emerged. It takes effect as ‘a plan of action for people, planet and prosperity’, which aims to ‘free the human race from the tyranny of poverty and to heal and secure our planet’ (United Nations, 2015). It has extended sustainable development out into a broader meaning, incorporating economic, environmental, social, and educational sustainability, including equitable development for every nation and every person (Bai & Sarkis, 2014; Fergus & Rowney, 2005). A total of 17 Sustainable Development Goals and 169 associated targets were set up for the 2030 agenda for the international community to reach in the next 15 years (United Nations, 2015). This aforementioned opinion of sustainable development is widely accepted and shared by specialists and institutions (Max-Neef, 2011; United Nations, 2017).

China is one of the active countries in the field of promoting sustainable development, both historically and contemporarily. One of the key components of traditional Chinese civilisation is to maintain harmony (Chinese word ‘*he*’) between human beings and nature (ecological sustainability), and between human and human (social and economic sustainability) (Chan, Choy & Lee, 2009). The Chinese government has been participating actively in international conferences on the matter

of sustainable development, such as the United Nations Conference on the Human Environment (the Stockholm Conference), the United Nations Conference on Environment and Development (the Rio Conference) and the Johannesburg World Summit on Sustainable Development (the Johannesburg Summit). China has released plenty of policies on sustainable development as well. Among these policies the document entitled *China's agenda 21: White paper on China's population, environment and development in the 21st century* (The State Council, 1994) is the most important one, which has been incorporated into national strategies, such as pursuing steady and rapid economic development, increasing people's living standards, improving population quality, and advocating resources conservation and environmental protection among people (Chinese Government, 2012).

The Chinese government believes that one of the most important strategies to construct a sustainable society is to promote education development (The State Council, 1994), especially adult education development with modern technology (The Ministry of Education of the People's Republic of China, 2016). An objective of the report entitled *To build a well-off society in an all-round way and create a new situation in building socialism with Chinese characteristics* delivered by the General Secretary of Communist Party of China and President of the People's Republic of China Jiang Zemin (2002) is stated as: 'A learning society in which all people can learn or pursue lifelong education will emerge to boost all-round development'. Since that time constructing a lifelong learning society and promoting sustainable development have become two of the most important goals in Chinese development.

Several official documents have been released, which aim to achieve the aforementioned two goals. The document entitled *The national ten-years educational reform and development program (2010–2020)* purposes to cultivate a learning society by the year 2020 and to promote sustainable development in Chinese society (The Ministry of Education of the People's Republic of China, 2010). Another official document entitled *The thirteenth national five-year plan* reaffirms the significant value of developing lifelong learning in promoting sustainable development. It states that society is required to widen the continuing education and lifelong learning channel, promote education information, develop distance education, and expand the

coverage of quality education resources (The National Development and Reform Commission, 2016). Adult education is not compulsory in China. Currently it is an important way for individuals to improve their working abilities. There are two kinds of teaching approaches in Chinese adult education: traditional teaching approach and e-learning teaching approach. These two teaching approaches have their own advantages and limitations. The former increases the opportunities for learners to communicate with their teachers and their peers but wastes time in travel between a student's home and university; while the latter decreases the opportunities to communicate with peers (Cao & Yao, 2015). Therefore, a new teaching approach is required to promote adult education and lifelong learning in China. In recent years, some measures for promoting lifelong learning and sustainable development have been suggested officially (The Ministry of Education of the People's Republic of China, 2016). Online learning, combined with traditional learning (that is a blended learning environment), is believed to have potential. Theoretically, with the characteristics of comfort and convenience for learning, a blended learning environment can enable more learners to attend continuing education, which will promote sustainable development. However, this suggestion is only a hypothesis. Thus, the current study tries to investigate and analyse in which way a blended learning environment promotes sustainable development.

Studies on sustainable development related to education in China

China's agenda 21: White paper on China's population, environment and development in the 21st century highlights the important role of education in a sustainable development society, which aims to train researchers on sustainable development through educational courses, work-based training and extension activities (The State Council, 1994). *The 1995 education law of the People's Republic of China* reaffirms the vital roles of education in promoting sustainable development (the National People's Congress of the People's Republic of China, 1995). Another document entitled *The higher education law of the People's Republic of China* echoes the aforementioned two documents and reiterates the irreplaceable role of education in promoting sustainable development, such as training at senior levels and progressing scientific, technological and cultural changes (the National People's Congress of the People's Republic of China, 1998).

Tsinghua University is a pioneer in education for sustainable development in China (Zou & Zhao, 2015). Tsinghua's strategies for sustainable development can be concluded into 'one principle and three dimensions'; 'one principle' means to build a green university; 'three dimensions' is composed of the three conceptions of 'green education', 'green research' and 'green campus' (Zhao & Zou, 2015). Tongji University is another important member in promoting sustainable development in China. This university, combined with 31 other universities, has signed the *Tongji manifesto*, which advocates that more universities assume greater responsibility for sustainability (Lu & Zhang, 2014; Yuan, Zuo & Huisingh, 2013). Tsinghua University and Tongji University are influential universities in China and worldwide. They have become models for other universities in China in promoting sustainable development. From this time on, more and more universities have begun to accept the green university initiative.

There is a lot of literature focussed on sustainable development for education in China. These previous literature can be grouped into three broad research aspects. The first type of study is to analyse and examine laws and policies related to education for promoting sustainable development (Niu, Jiang & Li, 2010). The second type of study is case studies about Chinese universities with a descriptive or social contextual analysis (Geng, Liu, Xue & Fujita, 2013; Yin, 1989; Yuan et al., 2013; Zhao & Zou, 2015). The third type of study is comparative studies, which compares sustainable development among different levels of Chinese universities (Zhao & Zou, 2018) or universities in China and abroad (Holm, Sammalisto & Vuorisalo, 2015; Zou, Zhao, Mason & Li, 2015). These studies indicate that China's green university initiative usually pays attention to traditional formal education on environmental protection; while few studies have taken a look at other types of education, such as adult education or continuing education. In addition, few studies have analyzed the roles of education in promoting sustainable development other than environmental protection.

Challenges that China faces in sustainable development

As a developing country with a population of more than 1382 million (The National Bureau of Statistic of the People's Republic of China, 2016), China encounters challenges from different aspects in sustainable development, such as environmental problems (Lam, 2011; Zhai, Reed

& Mills, 2014), energy security problems (Liu & Jiang, 2009), economic development problems (Bai, Sarkis & Dou, 2015) and traffic problems (Zhao, 2012). Excluding the aforementioned problems in sustainable development, a huge imbalance is evident between males and females and between those in cities and in the rural areas, who face some of the most dire development challenges. This imbalance contradicts the purpose of the *2030 agenda*, which aims to achieve gender equality and reduce inequality within and among countries (United Nations, 2015).

Traditional Chinese society discriminates against females; for example, a woman is traditionally expected to do all of the housework and affiliate to her husband for life. One of the concepts hindering women in obtaining equal position with men is that women's educational rights have been expropriated. Traditional Chinese culture advocates that it is a desired virtue for women to be illiterate. Though modern Chinese society has elevated women's social position (Yao, 2013), there are still some obstacles hindering female equality. One of the most significant obstacles is the access to education. Many more girls drop out of school in their early years compared with boys. The data from the Population and Employment Statistics Division of National Bureau of Statistics of the People's Republic of China (2016) illustrate the differences between males and females in access to education and in education quality: among those over 6 years old, 8.27 per cent of females do not access formal education, and among those over 15 years old 8.01 per cent of females are illiterate; while the rate of males is only 3.22 per cent and 2.08 per cent, respectively. Females do not have the same opportunities to be educated as males do, which undermines their opportunities to improve themselves and hinders sustainable development in the area of gender equality.

Another factor affecting sustainable development in China is the huge gap between those living in cities and those in rural areas. According to the National Bureau of Statistics of the People's Republic of China (2017), per capita disposable income, the per capita consumption expenditure, and the medical technical personnel in health care institutions per 1000 persons, are all 2.7 times greater in cities than those in rural areas. The most important reason that has led to this huge gap is the lack of highly qualified human resources in rural areas. Education is the essential factor that hinders sustainable development

in rural areas (Han & Du, 2012), as modern science and technology play a vital role in personal development, community development and national development. The data from the Population and Employment Statistics Division of National Bureau of Statistics of the People's Republic of China (2016) clearly illustrate the differences in the rates of those educated in cities, towns and rural areas: those over 6 years old without access to formal education in cities, towns and rural areas are 2.29 per cent, 4.97 per cent and 8.65 per cent, respectively; while the illiteracy rates are 1.99 per cent, 4.71 per cent and 8.57 per cent in cities, towns and rural areas, respectively. That is to say, there are more individuals in rural areas without access to education than those in other areas, which is the essential factor leading to unsustainable development across different areas (Alonso-Almeida, Marimon, Casani & Rodriguez-Pomeda, 2015; An, Davey & Harun, 2017; Ceulemans, Lozano & Alonso-Almeida, 2015).

Adult education and sustainable development

Previous studies (Bai et al., 2015; Geng et al., 2013; Han & Du, 2012; Holm et al., 2015; Lam, 2011; Liu & Jiang, 2009; Lu & Zhang, 2014; Niu et al., 2010; Yin, 1989; Yuan et al., 2013; Zhai et al., 2014; Zhao & Zou, 2018; Zhao, 2012; Zou et al., 2015) have explored sustainable development in China related to education and some challenges that China faces in sustainable development. Both policy makers and scholars have contributed a lot to promote sustainable development in China. However, they usually pay attention to traditional formal education on environmental protection. Few studies have taken a look at other types of education, such as adult education or continuing education, in promoting sustainable development. In addition, few studies have analysed the role of education in promoting sustainable development other than environmental protection. Thus, the current study tries to analyse in which way a blended learning environment in adult education promotes sustainable development in China.

Research methods

The methods adopted in the current study are literature analysis and a semi-structured survey. The former is used to analyse the connection between sustainable development and adult education, especially

adult education in a blended learning environment; the latter is used to examine adult learners' viewpoints on the effectiveness of a blended learning environment in promoting sustainable development.

The literature analyses performed for this paper are based on constant comparative analysis via an iterative process, reflecting on the authors' understandings and interpretations of sustainable development and the characteristics of a blended learning environment in adult education. It follows a similar approach to the constant comparative analysis used in Grounded Theory (Bryman, 2004), where the initial framework for analysis is done in the context of (1) the dimensions of sustainability such as equality among human beings and environmental factors, and (2) the characteristic of a blended learning environment in adult education. The analyses have been done based on the author's interpretations of how a blended learning environment and sustainable development are related.

Secondly, this study uses a semi-structured questionnaire to survey learners' viewpoints on the effectiveness of a blended learning environment in promoting sustainable development. The questionnaire is designed and validated through a number of steps referenced to Jorge, Madueño, Cejas and Peña. (2015) and Pérez-Foguet et al. (2018). Firstly, an extensive literature review, specifically related to sustainable development (Bai & Sarkis, 2014; Fergus & Rowney, 2005; Kuhn & Deetz, 2008; Max-Neef, 2011; United Nations, 2015; 2017; World Commission on Environment and Sustainable Development, 1987), and sustainable human development (Barth & Rieckmann, 2012; Pérez-Foguet et al., 2018), has been performed. The questionnaire is then designed and validated by a pretest in North China University of Science and Technology, Tangshan, China. The pretest results show that the reliability and the validity of the questionnaire are 0.82 and 0.85, respectively, which is valuable enough as a tool to investigate the learners' authentic opinions on the effectiveness of a blended learning environment in promoting sustainable development. The questionnaire is comprised of six closed questions, employing a five point Likert scale from 'strongly agree' to 'strongly disagree'. And then, a second validation of the survey is conducted in North China University of Science and Technology. Two hundred adult learners took part in the survey. Finally, the subjects in the study and the survey results are as follows: there

are 168 valued questionnaires totally, 91 of which come from female learners while 77 from male learners, and 88 of which are finished by learners in rural areas while 80 in cities. All the subjects in the study majored in engineering.

Adult education and blended learning in China

Adult education was established as early as in 1949, the year the People's Republic of China was established. In the first decade, adult education served as the most important strategy to eliminate illiteracy. Unfortunately from 1966 to 1976, Chinese society veered in a different direction. At that time, formal education in China was transferred into a 'moral cultivation institution' and adult education was forbidden by the Chinese government. In 1978, Chinese government re-established the adult education system. The updated official statistic data revealed that in 2016 the number of adult education students in tertiary schools was up to 12,293,212 (The National Bureau of Statistics of the People's Republic of China, 2017).

In recent years, blended learning environments have appeared in China, contributed mostly by textbook publishers. In order to enhance the publisher's competitiveness and help learners improve their academic performance, some textbook publishers have offered supplement online learning materials in their learning management system (LMS) and established some online discussion forums for learners. Thus, some universities in China tried to explore the blended learning classes in both adult education and formal education, in which students learn their lectures online and off line.

Generally speaking the nucleus structure of a blended learning environment is composed of three parts: task based online learning, group based peer learning and class based face-to-face traditional learning (see Figure 1).

In the online learning part, it is necessary for every learner to access a computer with multimedia software and connected to the Internet. To guarantee access, the Internet speed must be fast enough for all learners to use it at the same time. In addition, the capacity and the size of the LMS must be large enough. Before each lecture in a classroom, teachers release

learning materials and some tasks on the LMS to the learners. Learners are required to study the learning materials and finish their assignments. They can search online for the required information and required skills to finish their tasks. At the next stage, learners share their understanding and information of the task with their peers on the Internet forum or face-to-face with each other. They are required to comment on their peers' tasks and learn from each other. If learners encounter some difficulties, they can ask for help from their teachers through the LMS. In the classroom lecture, learners present what they have learned to their teacher and their peers. The teacher evaluates what the learners have learned and solves the questions that learners meet in their acquisition. The teacher is also required to interview learners to become familiar with the learning activities and offers some suggestions to learners. After the lecture, assignments are given, which the learners are required to finish on the spot. The teacher marks the assignments on the spot as well. If the teacher finds a learner has difficulties in learning, s/he will tutor the learner individually. Figure 1 illustrates the teaching model.

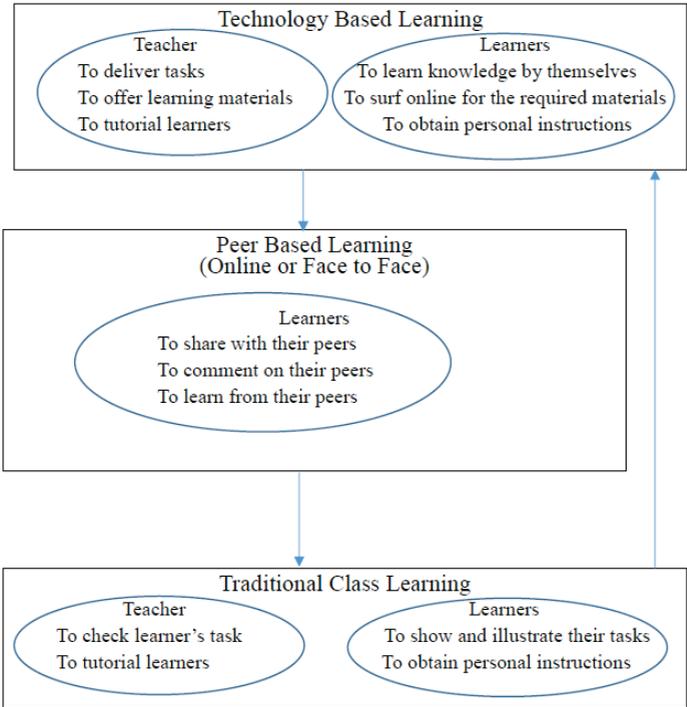


Figure 1: A blended learning environment.

Discussion

A previous study (Yao, 2017) has verified that a blended learning environment can assist learners in improving their academic performance. The current study finds that a blended learning environment can promote sustainable development as well.

Adult education and sustainable development

Previous studies have indicated that education plays an important role in promoting sustainable development (Alonso-Almeida et al., 2015; An et al., 2017; Ceulemans et al., 2015). Of course the education here includes both formal education and informal education, such as adult education and continuing education. The Chinese government has paid great attention to adult education for a long period of time. In May 2001, the President of People's Republic of China (Jiang, 2001) called on the government to build a learning society. From the year 2004 to the year 2008, the number of tertiary students in adult schools increased from 4,197,956 to 5,492,949 (The National Bureau of Statistics of the People's Republic of China, 2005; 2009), owing to the ease and convenience of adult education regarding enrolment and attendance. However, from 2009 on the number of tertiary adult students hovered at its former levels, even decreasing slightly (The National Bureau of Statistics of the People's Republic of China, 2010; 2011). Current society has required a new learning environment to promote adult education. In May 2015, the International Conference on Information Communications Technology in Education was held in China. At its opening ceremony, the President of People's Republic of China Xi Jinping (2015) delivered a welcome letter and called on the government to build a society in which every individual could learn anywhere and anytime. A blended learning environment meets the requirements of promoting adult education development, especially for females and those in rural areas.

The current study includes a survey to examine learners' opinion about the effectiveness of adult education to sustainable development. Half of the learners in the survey strongly agreed that 'it is convenient to participate in adult education in a blended learning environment'. Fifty three learners agreed with this opinion; another 31 learners neither agreed nor disagreed with this opinion. No other options were selected. Further analysis showed that more female learners (58.2%) or those in

rural areas (61.4%) strongly agreed with the opinion than male learners (40.3%) or those in cities (37.5%), respectively. The results of Spearman's correlation analysis show that the aforementioned differences are significant (both ps equal to 0.001, and are less than 0.05). Given the convenience of learning activities in a blended learning environment, 75 learners in the survey strongly agreed that they hoped to continue education when they graduated from school; 65 learners agreed with this opinion; another 28 learners neither agreed nor disagreed. Other options were not selected. Further, the results of Spearman's correlation analysis found that the differences between female learners and male learners ($p = 0.600 > 0.05$) or between learners in rural areas and those in cities ($p = 0.778 > 0.05$) were not significant. Figure 2 and Figure 3 reveal the detailed survey results on the aforementioned two questions vividly.

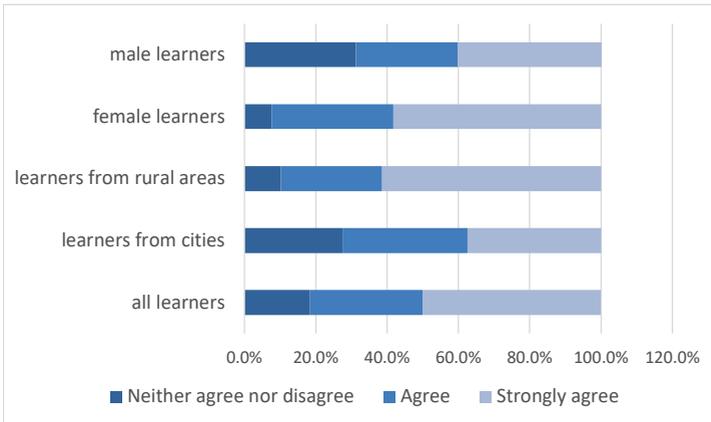


Figure 2: Response to the question – ‘It is convenient to participate in adult education in a blended learning environment.’

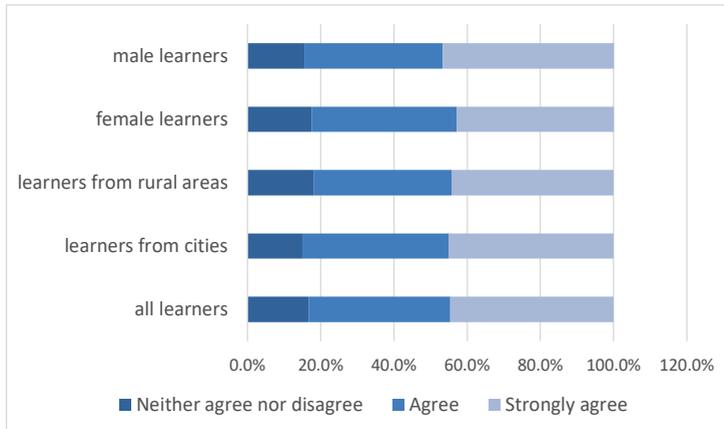


Figure 3: Response to the question – ‘I hope to continue my education when I graduate from school’

Protecting natural environment

The education sector should not only aim to teach sustainable development knowledge, but also act and develop sustainability itself (Velasco & Harder, 2014), such as the building of green campuses (Zhao & Zou, 2015), or setting up systemic sustainability educational courses (Lozano et al., 2017). Compared with a traditional learning environment, a blended learning environment can promote sustainable development. Firstly, a blended learning environment is an eco-conscious learning environment. In a traditional learning environment, at least in China, learners are often required to hand in hard copy assignments, which consume a lot of paper. While in a blended learning environment almost all the assignments are handed in online, which decreases the consumption. Secondly, a blended learning environment can lighten the learners’ burden of commuting. Learners in a blended learning environment are required to learn at home with a computer. They are not required to drive from home to university every day, decreasing carbon consumption and reducing traffic congestion. This study indicates that a blended learning environment can decrease paper consumption and carbon consumption, as well as lighten traffic congestion, which is a valuable way to promote sustainable development.

The survey results in this study verify that Chinese adult learners have drawn similar conclusions. One hundred learners in the survey

strongly agreed that ‘a blended learning environment decrease learners’ consumption of paper and the other office supplies’; 55 learners agreed to this opinion; another 13 learners neither agreed nor disagreed. No other options were selected. Further analysis showed that more male learners (62.3%) or those in rural areas (63.6%) strongly agreed with that opinion, compared with female learners (57.1%) or those in cities (55.0%), respectively. However, the results of Spearman’s correlation analysis show that both differences are insignificant ($p = 0.543$ and 0.212 , respectively – both are more than 0.05). On the other hand, 96 learners in the survey strongly agreed that ‘a blended learning environment lightened their travel burden from home to the university’; 51 learners agreed with this opinion; another 21 learners neither agreed nor disagreed. No other options were selected. Further analysis revealed that more learners in rural areas (62.5%) strongly agreed with the opinion than those in cities (51.3%); and the ratio of female learners (58.2%) who strongly agreed to this opinion is a bit higher than that of male learners (55.8%). However, the results of Spearman’s correlation analysis show that both differences are insignificant ($p = 0.431$ and 0.204 , respectively – both are more than 0.05). Figure 4 and figure 5 reveal the detailed survey results on the aforementioned two questions.

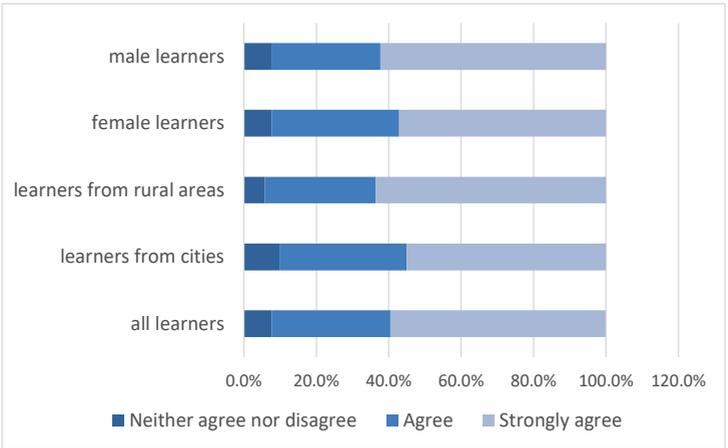


Figure 4: Response to the question – ‘A blended learning environment decreased my consumption of paper and the other office supplies’

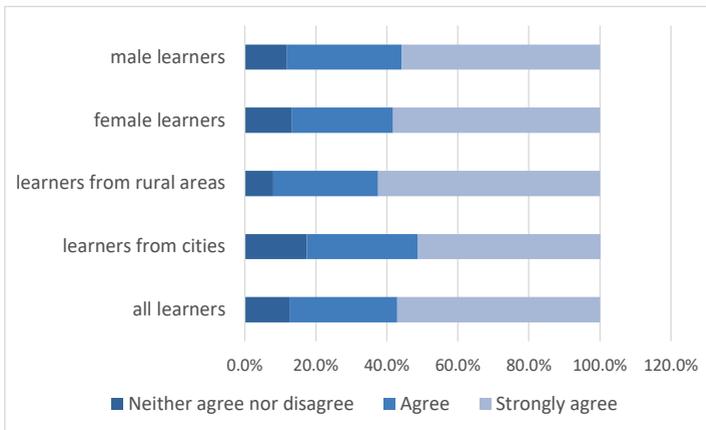


Figure 5: Response to the question – ‘A blended learning environment lightened my efforts on travelling between home and the university’

Achieving gender equality and reducing inequality between cities and rural areas

The imbalance between males and females and between cities and rural areas hinders sustainable development in China. One of the essential factors which has led to the imbalance is education. Facing discrimination rooted in traditional Chinese culture, females in China do not have the same access to formal education as males do. Because of political reasons and historical reasons Chinese universities are usually located in cities. For economic reasons and geographical reasons, those in rural areas cannot access formal education as easily as those in cities. With a newly designed blended learning environment, a woman can study as well as continue with her household obligations. She needn't alternate between being a housewife and a tertiary learner. On the other hand, a blended learning environment can bridge the geographical gap between cities and rural areas in education, as learners needn't go to schools every day. Hence, these results suggest that a blended learning environment can offer females and those in rural areas the opportunity to be educated as other learners, which helps achieve gender equality and reduce inequality between cities and rural areas.

Eighty-five learners in the survey strongly agreed that ‘they become more confident in themselves after they take part in adult education’;

62 learners agreed with this opinion; another 21 learners neither agreed nor disagreed. No other options were selected. Further analysis revealed that the ratio of female learners (51.6%) who strongly agreed to this opinion is a bit higher than that of male learners (49.4%), but the differences are insignificant ($p = 0.815 > 0.05$); while more learners in rural areas (58.0%) strongly agreed with the opinion compared with those in cities (42.5%), and the differences are significant ($p = 0.024 < 0.05$). On the other hand, 133 learners in the survey strongly agreed with the point that ‘adult learning experience is beneficial to their future career’; 22 learners agreed with this opinion; 13 learners neither agreed nor disagreed to this opinion. No other options were selected. Further analysis revealed that more learners in rural areas (80.7%) strongly agreed with the opinion compared with those in cities (77.5%), but the differences are insignificant ($p = 0.655 > 0.05$); and the gender difference to this question (79.1% vs. 79.2%; $p = 0.991 > 0.05$) is indistinguishable. Figure 6 and Figure 7 show the detailed survey results on the aforementioned two questions.

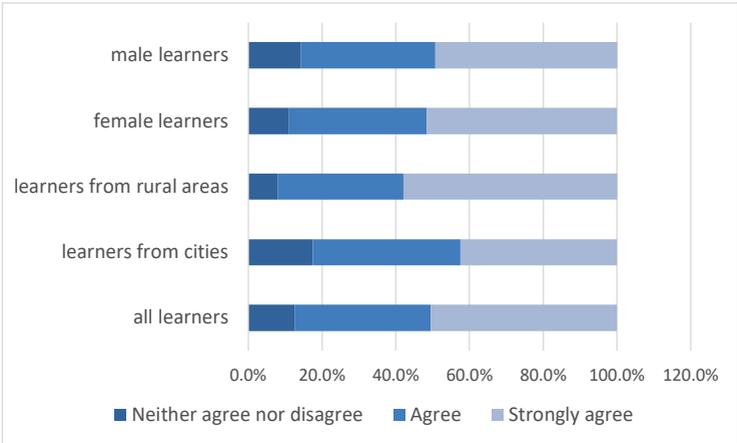


Figure 6: Response to the question – ‘I become more confident on myself after I took part in adult education’

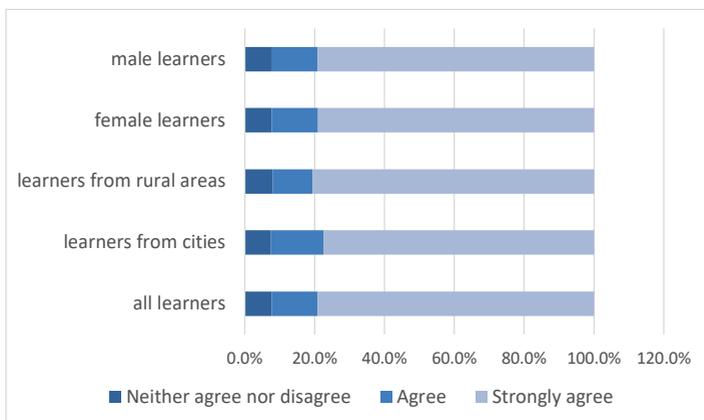


Figure 7: Response to the question – ‘Adult learning experience is beneficial to my future career’

Conclusions and future perspectives

Sustainable development is one of the essential goals for every country or district, including China. Currently, China is confronting several challenges in promoting sustainable development. This includes unbalanced development between females and males and between rural areas and cities. This study finds that a blended learning environment can promote adult education development, reduce the development inequality between genders and geographically, as well as protect natural environments.

Firstly, with the characteristic of comfort and convenience for learning, a blended learning environment promotes the sustainable development of adult education. With a blended learning environment the numbers of tertiary students in adult education increase rapidly. Next, a blended learning environment is an eco-friendly learning environment, as learners in a blended learning environment almost rarely hand in hard copy assignments and do not commute from home to the university every day. Thus, a blended learning environment is helpful to construct a resource-saving society. Furthermore, a blended learning environment bridges the gap in sustainable development between females and males and between those in rural areas and those in cities. It increases the opportunities for females and those in rural areas to be educated and

promotes sustainable development in these areas. More importantly, the survey results reveal that female learners or those in rural areas prefer a blended learning environment, compared to other learners in general.

Previous studies have verified the effectiveness of new technology or new teaching approach in promoting sustainable development. One study (Azeiteiro, Bacelar-Nicolau, Caetano & Caeiro, 2015) reports that e-learning in higher education can be of great relevance to effective lifelong learning for sustainable development in a population of students who are simultaneously full-time employees. Pérez-Foguet et al. (2018) reports that an online learning environment can promote sustainable human development in engineering degrees. The current study draws similar conclusions as the aforementioned studies. More importantly, the study finds that female learners or those in rural areas prefer a blended learning environment to other learners.

Looking back on the study, we can find several limitations in it. Firstly, the study tries to answer the question how a blended learning environment promotes sustainable development in China. As it is very difficult to find any 'official data' to illustrate the relationships between a blended learning environment and sustainable development, the evaluation of the effectiveness of a blended learning environment on sustainable development in the study is based on some students' perception only. Although students' perception can answer the question in some way, the lack of hard evidence to support the conclusion is a limitation in the study. Secondly, the study investigates students' perception on the effectiveness of a blended learning approach on sustainable development with a questionnaire. In the questionnaire there are six closed questions, with two questions focussing on each dimension. The questionnaire only includes a small part of the concept of sustainable development and the study only gets 168 valued questionnaires. It is better to enlarge the number of questions to include more concepts of sustainable development and increase the numbers of the subjects. Thirdly, the study takes China as an example and all the data have been obtained in China. Whether the results can be used in other countries or districts, is still unknown.

We hope this study will be of use to education policy makers and practitioners interested in sustainable development. However, this study

is only tentative research in a Chinese context. Future studies could possibly explore how blended learning environments improve sustainable development in different countries or districts, and compare the findings. We will continue this study and try to find out the most appropriate pathway for sustainable development through advanced technology.

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