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ARTICLE

Environmental Education, Knowledge and Awareness in China: A Case of Xiamen University Students

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This study documents China's efforts to build its formal environmental education system and explores university students' environmental knowledge and awareness using a survey carried out at Xiamen University, which is located on the southeastern coast of China. We find that the Chinese state made rapid progress in setting up environmental studies programs in its institutions of higher education, but it took the state over two decades to build a nationwide curriculum integrated with environmental studies for primary and secondary schools. The survey data revealed that these efforts have borne fruit. Students have improved in their environmental knowledge over time. Nevertheless, students remain disconnected from most environmental organizations. This may hinder China's efforts to harness their environmental knowledge for the sake of effective action toward safeguarding the environment. The state should help encourage further cooperation among different social groups so China has a chance to fulfill its potential to become a global leader on environmental issues.

Keywords: environment; education; knowledge; awareness; students; China

The United States was perceived in the 1970s as a global leader in domestic and foreign environmental policy-making, but it occupied that position for a very short time before it came to be widely considered a “laggard” in environmental policy by the early 2000s (Eckersley 2012). The Trump administration’s 2017 decision to withdraw from the Paris Agreement seems to reflect that general trend. Some scholars have speculated that China, the “nearest peer competitor” to the US in today’s world (Nadkarni 2013), has a chance to become the next green leader (Griffiths 2017, Zhang 2017). One scholar even argues that China has transformed from an environmental “bad boy” into a potential leader in climate policy (Hilton 2016). China’s environmental policies under the leadership of Hu Jintao (2002–2012) and Xi Jinping (2013–present) seem to corroborate this assessment. The Hu administration’s “Notion of Scientific Development” placed a heavy emphasis on coordinated and sustainable development as well as the maintenance of harmony between humanity and nature. The Chinese Communist Party penned the concept of “ecological civilization” and officially deemed its achievement a national goal during its 17th Party Congress in October 2007. The CCP then enshrined that in the Constitution of the Party during its 18th Party Congress in November 2012. The Xi administration furthered the task of building a beautiful China and an “ecological civilization” by adding this visionary goal to the state constitution during the 3rd Plenary Meeting of the 1st Session of the 13th National People’s Congress in March 2018.

These measures taken by the Chinese state were all laudable. Yet China will not be able to fulfill its potential as a green leader if the drive for innovation in environmentally sustainable development remains nothing more than a government-led initiative. The general public must also learn to adjust their behavior to follow a more environmentally friendly lifestyle. The younger generation’s perception of the environmental problems facing China is especially important. Their engagement in the process of making China a truly “green” civilization is certainly one of the key factors needed to achieve a lasting harmony between humanity and nature in China in the coming decades. As Chinese philosopher Guan Zi argues, “If you are thinking one year ahead, then nothing is better than growing grain; if you are thinking ten

years ahead, then nothing is better than planting trees; if you are thinking one hundred years ahead, then nothing is better than educating the people." This study therefore explores the efforts China has made in formal environmental education¹ as well as the environmental knowledge and awareness of Chinese university students.

China's efforts in building its environmental education system can be traced back to the 1970s when many institutions of higher education began setting up majors in Environmental Science/Engineering. In the 1980s these institutions also started offering courses in environmental protection for non-majors. Some secondary and primary schools incorporated environmental education into different subjects gradually over the 1980s and 1990s. Eventually, in 2003, *Guidelines for the Implementation of Environmental Education in Primary and Secondary Schools (Trial)*, released by the Chinese Ministry of Education, formally required nationwide efforts to integrate environmental education into the curricula and activities of primary and secondary schools. It was at this time that China officially established an environmental education system ranging from higher educational institutions to primary and secondary schools.

What is the level of knowledge and awareness in university students after a decade of systematic environmental educational effort? Based on a survey of 150 students at Xiamen University in 2015, we found that, overall, China's environmental education programs have led to some positive outcomes. Environmental education reached most of the students (89 percent) while they were growing up. Nearly 99 percent of students had heard about global warming issues when they were in high school. Students' general knowledge of environmental problems had substantially improved in comparison with previous studies (He et al. 2011). The students' gender and the development level of their home province was shown to have no significant effect on students' environmental knowledge. Students demonstrated positive environmental awareness and promising responsible behaviors in five out of six scenarios. One

¹ This study limited its research scope to formal environmental education through the school systems while acknowledging that environmental education can be done through venues outside the school systems, such as family and the media.

exception was their slight preference for using private cars over public transportation. Students lacked knowledge of environmental non-government organizations (NGOs), which could potentially serve as an avenue to participation in environmental protection or as a resource to learn more about environmental problems outside of campus. The challenge in the coming years for China's environmental education will be finding how to transform students' environmental knowledge and awareness into action that will have a concrete, positive impact on the environment. The Chinese government might want to encourage environmental NGOs to work with students on environmental issues. Otherwise, China might miss this opportunity to fulfill its potential to become the world's next green leader.

The following pages will present a concise history of China's formal environmental education initiative, and then will situate the current survey in the existing literature to highlight the contribution of this study. Next the article will discuss our major findings based on survey data. Finally, we will conclude by exploring the implications of our findings for China's future environmental efforts.

A Concise History of China's Formal Environmental Education

China strove to build up its environmental education system over the years in response to two factors. One was connected to China's domestic environmental crises. The other was linked to its exposure to revelations about the environment from the international community. In 1972, two environmental disasters seized the attention of Chinese leaders and made them realize the severe consequences of neglecting the environment (Jing 2010). The first disaster took place in northeast China, where the Dalian Bay turned black due to pollution from untreated industrial waste (Zhou 2008). The cost of the Dalian Bay contamination was alarming. 5,000 mu (about 824 acres) of the bay used to farm shellfish were ruined with the loss of over 5,000 kilograms of sea cucumber and the loss of over 100,000 kilograms of shellfish (Zhao et al. 2014). The second disaster took place in 1972 in Beijing, where the fish in the Guanting Reservoir were poisoned by heavy metals discharged from nearby factories. In March 1972, the fresh fish sold in Beijing had a strange taste, and those who ate the fish showed the symptoms of being poisoned—headaches, stomachaches, and

vomiting. The Department of Health reported this incident to the State Council and Premier Zhou Enlai. In June 1972, the investigation team reported the results to Zhou, who then ordered that a leadership office be organized to direct the process of cleaning up the Guanting Reservoir (Qu 2006). Cleaning up the Guanting Reservoir was the first pollution-treatment project in Chinese environmental history.

These two environmental events were followed by the beginning of the People's Republic of China (PRC's) efforts to protect the environment from the mounting threats posed by China's massive and rapid industrialization. On the international front, for the very first time Chinese delegates attended the UN Conference on the Human Environment held in Stockholm, Sweden in June 1972. On the domestic front, China hosted its own First National Conference on Environmental Protection in August 1973, organized by the State Planning Committee with a mandate from the State Council. This conference led to the promulgation of *Several Regulations on Protecting and Improving the Environment (Trial)*, which called for efforts to develop research (*yanjiu*), propaganda (*xuanchuan*) and education (*jiaoyu*) on environmental protection. Particularly, the regulations required that institutions of higher learning offer majors and courses on environmental protection. This marked the first major step China had taken in establishing its environmental education system (Tian and Li 2016, 85).

Chinese institutions of higher learning responded immediately to these demands from the state. For instance, Peking University, Beijing Engineering University, Zhongshan University, and Tongji University began to offer courses in environmental studies between 1973 and 1978 (McBeath et al. 2014, 8; Palmer 1998, 177). Tsinghua University established the first major in Environmental Engineering in 1977 (Tian and Li 2016, 85). Due to the consistent emphasis put on environmental education in the higher educational institutions, by the end of 1995 there were 241 higher educational institutions that had established majors in environmental fields at different levels ranging from two-year colleges to postdoctoral institutions (Hu et al. 1998). By 2012, the number had increased to 500 (Tian and Li 2016). In addition to the efforts to train specialists and professionals in environmental fields, in the late 1980s many higher educational institutions also started offering elective courses

for non-specialists and non-professionals to spread environmental knowledge and awareness (Palmer 1998, 178).

Unlike the early and rapid development of environmental education in institutions of higher learning, the pace at which environmental education was established in primary and secondary schools was much slower. The call to action for primary- and secondary-level institutions (K-12) came five years later than for institutions of higher learning. In 1978, the Leader Group on Environmental Protection of the State Council pointed out in *Key Points of the Working Report on Environmental Protection* that environmental protection should be incorporated into the curriculum of primary and secondary schools (Tian and Li 2016). In September of 1979, China passed its first environmental protection law—*The Environmental Protection Law of the People's Republic of China (Trial)*. This legal document continued to emphasize the responsibility of higher educational institutions to offer compulsory courses or majors in environmental protection to train specialists in the field. The document further required that “an appropriate amount of content about environmental protection should be written into primary and secondary school curriculum” (Article 30).

The policy was partially implemented in the 1980s. In 1981, three-year pilot environmental education programs started at selected primary and secondary schools following the recommendation made by the Working Committee on Education of the Chinese Association of Environmental Science (Zhu and Dillon 2001, 343). In December 1983, one of the most important developments during the Second National Conference on Environmental Protection was the official announcement that environmental protection was a long-term principal state policy (*jiben guoce*) – an announcement that was made by then Vice-Premier Li Peng. In response to this new policy, environmental education was required to be included in the biology teaching syllabi at the national curriculum level in 1984 (McBeath et al. 2014, 39). In December 1989 the formal Environment Protection Law was promulgated. Article Five stipulated that “the state encourages the development of the science and education on environmental protection, enhances the research and development of scientific technology on environmental protection, advances

the level of scientific technology on environmental protection, and universalizes scientific knowledge on environmental protection.” This document gave environmental education a legal status.

The development of environmental education in primary and secondary schools entered a critical period following 1992. In June 1992, the UN Conference on Environment and Development was held in Rio de Janeiro, Brazil. Its outcome document, *Agenda 21*, called on all states to devise a sustainable development education strategy by the end of 2002. In response to the call, China promulgated *Ten Measures on Environment and Development in China* in 1992. The eighth of these ten measures was to enhance environmental education and keep improving the environmental awareness of the whole nation. Specifically, it called on all levels of educational institutions to pay attention to environmental education, to universalize the awareness of environmental issues among K-12 students, and to continue supporting and strengthening the majors on environmental protection at all levels of higher educational institutions (Qu, *The China Council for International Cooperation on Environment and Development*, 1993). Also in 1992, the First National Environmental Education Conference was held, and the theme of the conference was “Education—the Foundation for Environmental Protection.” It emphasized four aspects of environmental education. One of them reiterated the importance of educating K-12 students on the environment and cultivating their environmental awareness.

In 1993, Beijing Normal University recruited its first class of master students in Environmental Education. In 1994, China released its own Agenda 21, the *White Paper on Population, Environment and Development of China in the 21st Century*. Chapter Six of the White Paper was entitled *Education and Sustainable Development Capacity Building*. China's environmental education was redefined as education for sustainable development following the recommendations of Agenda 21.

In July 1997, the State Education Committee, World Wildlife Fund (WWF)-China, and BP began promoting an “Environmental Education Initiative in Primary and Secondary Schools of China.” This initiative was executed in three phases. The first phase between 1997 and 2000 focused mainly on training teachers and

developing curricula and teaching resources—in addition to experiments with pilot school programs. The second phase (2001–2004) coincided with a new round of the State Basic Education Curricula Reform launched by the Ministry of Education to integrate the concept, content, and methods of education for sustainable development into new curricula. The important achievement of the second phase was the publication of *Guidelines for the Implementation of Environmental Education in Primary and Secondary Schools (Trial)* in November 2003. The Guidelines were the first state-level policy documents for environmental education in China. They ensured that environmental education would be an important component of the new national curricula and have a positive impact on nearly 200 million students in primary and secondary schools. The third phase (2005–2007) was focused mainly on promotion of nationwide implementation of the guidelines and practice of the concept of education for sustainable development in China's nearly 500,000 primary and secondary schools (WWFChina 2005). As a result of this ten-year initiative with an investment of \$3.17 million, environmental education centers were founded in 21 normal universities where 3,000 researchers and teachers received training in sustainable development (Sohu 2006).

Therefore, in 2003, with the promulgation of the guidelines, the Ministry of Education formally adopted environmental education as a required element in the curricula of the primary and secondary schools. By then, China had established its formal environmental education system that encompassed higher educational institutions as well as primary and secondary schools. After the CCP's 17th Party Congress in October 2007 made ecological civilization a national goal, China's environmental education was reoriented for a second time. It was no longer called Education for Sustainable Development, but was instead Education for Ecological Civilization.

The 2002 World Summit on Sustainable Development held in Johannesburg, South Africa, recognized that the goal set out in 1992 in Rio de Janeiro for all states to develop a sustainable development education strategy had not been achieved. The members of the summit then determined that the ten years following 2005 should

be a decade dedicated to a wider and more effective dissemination of sustainable development education (McBeath et al. 2014, 56). The UN endorsed this suggestion. Therefore, 2005–2014 became the decade of sustainable development for the world and China. Therefore, 2015 presented a good opportunity to assess the impact of this decade-long effort to boost environmental awareness of university students.

Existing Literature and Design of the Survey

What level of environmental awareness was achieved by university students in China after a decade of systematic environmental educational efforts? In the summer of 2015, with support from the Luce Initiative on Asian Studies and Environment Grant (LIASE), I had the opportunity to work with six undergraduate students at Eckerd College to design and carry out a survey on environmental knowledge and awareness for students at Xiamen University as a case of studying Chinese university students. We selected Xiamen University as the survey site because past collaborations provided ready connections for further cooperation.

Our survey built upon existing literature that dealt with similar topics. Only three studies during our research period proved to be relevant. For instance, Wong surveyed the environmental awareness of 350 students from ten universities in Beijing during the fall semester of the 1998–1999 academic year (Wong 2003). Wong's questions focused on students' awareness of urgent environmental problems, some of which are specific to China and some of which are global in scope. Later, Kong et al. built upon Wong's 2003 study and surveyed the environmental awareness of 753 students from four universities in Shanghai in June and July of 2012. Of those surveyed, 63 percent of respondents were male students (Kong, Ytrehus and Hvatum 2014). The questions from this second study were also focused on both global and national environmental issues. This study furthered Wong's work by exploring the influence of gender, family income, and city of origin on students' environmental awareness. He et al. surveyed the environmental knowledge, attitudes and behavior of 337 university freshmen with urban permanent residency in Shanghai and Gansu Province in 2007 (He et al. 2011). This study represented an effort to use comparative methods to determine whether regional factors such

as level of economic development and environmental problems were influencing students' environmental knowledge, attitudes, and behavior.

Given that the survey sites in the previous studies concentrated on Beijing, Shanghai, and Gansu and the latest survey was carried out in 2012, our study represents a new survey site (i.e. Xiamen) and an updated dataset (i.e. 2015). Moreover, Xiamen University is similar to universities in Beijing and Shanghai, recruiting students from all over China. Therefore, the results can be comparable. In particular, to facilitate the comparison, we drew survey questions from existing studies. For example, we borrowed 11 statements from He et al.'s 19 statements used to assess students' environmental knowledge. As a result, we can compare students' environmental knowledge over time.

Data and Findings

The survey questionnaire was written in English and then translated into Chinese for respondents to answer. Students were randomly selected from the library and cafeteria during final exam week of the spring semester of 2015. The total sample size was 150 students. In total, 76 male students (50.7 percent) and 74 female students (49.3 percent) were selected. Since Xiamen University is a comprehensive research university, we had eight students (5.3 percent) pursuing a doctoral degree, 26 students (17.3 percent) pursuing a master's degree, and 112 students (74.7 percent) pursuing a bachelor's degree. The four remaining students (2.7 percent) did not provide information about the degree they were pursuing.

To measure if environmental education had reached all students, we asked if they had learned about the environment while growing up. In 2003, China had established an environmental education program that exposed students to these issues during primary school, secondary school, and in institutions of higher education. Given that, we expected a "yes" to this question. However, we also expected there might be an implementation gap between policy and reality. We found that 89 percent of the students answered yes to this question. This shows that China's environmental education reached most of the students, but there still were some implementation gaps.

We cross-examined students about the reach of their environmental education by asking when they had first heard about global warming issues. About thirty-seven percent of students (36.7) indicated that they had learned about it in primary school, whereas 55.3 percent indicated that they had learned about it in middle school. By the time they reached high school, 98.7 percent in total had heard about global warming issues. This finding further supports the wide reach of environmental education in China. **Table 1** presents the data showing when the students heard about global warming issues.

To assess students' environmental knowledge, we ask students to answer thirteen true-or-false questions. Eleven of these questions were drawn from a comparative study of university students' environmental knowledge, attitudes, and behavior based on a survey conducted in 2007 in Shanghai and Gansu (He et al., 2011). Given that eight years had passed between 2007 and 2015 and given that China had launched major initiatives in environmental education in that period of time, we expected that students' environmental knowledge would have improved over time. Our findings indicated that students at Xiamen University in 2015 scored better in eight out of 11 common true-or-false statements than their counterparts in Shanghai and Gansu in 2007. **Table 2** provides an item-by-item comparison. Overall, university students in 2015 knew more about the environment than their counterparts in 2007.

Based on students' responses to the thirteen true-or-false questions, an index was created to examine the overall distribution of students' environmental knowledge

Table 1: Percentage of students who first heard about global warming issues, per level of schooling, as of 2015.

		When did you first hear about global warming?			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Elementary	55	36.7	36.7	36.7
	Middle	83	55.3	55.3	92.0
	High	10	6.7	6.7	98.7
	College	2	1.3	1.3	100.0
Total		150	100.0	100.0	

Table 2: Statements used to assess environmental knowledge by percentage of correct answers.

Statements	Xiamen (2015)%	Shanghai (2007)%	Gansu (2007)%
Sulfur hexafluoride is the main cause of ozone depletion.	45.3	91	50
Coral reefs and rainforests are places with rich biodiversity.	95.3	72	43
Burning plastic waste is the most effective way to control white pollution.	93.3	89	92
Most ozone in the atmosphere is found in the troposphere.	72.7	47	66
Soil degradation only happens in the northwest of China.	96.7	82	96
Sandstorms can cause air pollution and degrade the soil.	95.3	86	41
Domestic discharge of waste-water is the main source of river pollution.	4.7	61	75
Carbon dioxide, methane, and water vapor are considered greenhouse gases.	31.3	14	13
Oil is considered one of the major pollutants of the ocean.	74	35	32
Acid rain only occurs in industrial areas.	96.7	75	81
The major characteristic of white pollution is that it does not decompose.	84	85	49
Coal is a nonrenewable resource.	90		
Red tide is increased due to runoff.	17.3		

scores. **Table 3** presents the descriptive data on the scores. Each correct answer earned students one point, and each wrong answer earned students zero points. The highest possible score for each student was 13 and the lowest possible score was zero. We found that the highest score students earned was 12 while the lowest score earned was five with a mean score of nine. The average percentage of correct answers in students' environmental knowledge was 69.23 percent with a mean score of nine, being divided by the highest possible scores (13). This was improved from 54 percent among Shanghai and Gansu students in 2007 (He et al. 2011).

Table 3: Key statistics on environmental knowledge scores among students at Xiamen University, 2015.

<i>N</i>	Valid	136
	Missing	14
Mean		9.0147
Median		9.0000
Mode		9.00
Std. deviation		1.15461
Variance		1.333
Skewness		-.439
Std. Error of skewness		.208
Range		7.00
Minimum		5.00
Maximum		12.00

Existing literature has found that female students are generally more concerned about environmental problems, and students from more developed areas are more willing to prioritize environmental protection (Kong et al. 2014). We hypothesized that we would find a similar effect on students' environmental knowledge by gender and the level of development of a student's home province. Statistical analysis of the effect of gender and the level of development of a student's home province, however, showed no significant impact on students' environmental knowledge in our data.

To measure students' environmental awareness, we asked them to agree or disagree with six statements on their environmental behaviors or their intentions to commit to these behaviors. The number 1 indicated they strongly disagreed, 2 indicated they disagreed, 3 indicated they remained neutral, 4 indicated they agreed, and 5 indicated they strongly agreed. **Table 4** presents the questions and scores. Given that most students received systematic environmental education and demonstrated adequate environmental knowledge, we expected that students would have positive environmental awareness and exhibit a positive attitude toward the environment. The data showed that in five out of six areas students did have a positive attitude

Table 4: Items used to measure environmental awareness (with 1 as strongly disagree and 5 as strongly agree), 2015.

Items	Mean	Median	Mode
If you see trash on your way to school, you would pick it up and throw it in the proper place (such as a trash can).	4.3	4	5
In your residence you have a recycling bin that you use frequently.	3.85	4	4
You would sign a petition to increase protection of an endangered species.	4.46	5	5
You strictly adhere to environmental protection laws.	4.31	4	4
If you had the opportunity to take part in a local environmental clean-up activity, you would participate.	4.07	4	4
You prefer to use a personal car over public transportation.	3.18	3	3

toward the environment. However, students slightly preferred the use of a personal car over public transportation.

Existing literature has found that less than six percent of university students had joined environmental protection associations or organizations, and only 1.7 percent indicated that they were active members (Wong 2003). World Values Survey data presented in **Figure 1** showed that after a decade of environmental education, the percentage of active membership in environmental organizations did not change much. For instance, only 1.8 percent of respondents with a university-level education leading to a degree were active members of environmental organizations (WVS 2010-2014). We suspect that there is still a lack of connection between environmental organizations and university students. To test this hypothesis, we asked students if they had heard about Xiamen Green Cross Association (*Lü Shizi*). If the student had heard about it, we also asked if they knew what the organization does.

We chose Xiamen Green Cross Association to test our hypothesis due to its unique significance for the City of Xiamen. It claims to be the first grassroots environmental NGO in Fujian Province. It was founded in 1999 and registered with Xiamen Civil Affairs Bureau in 2007 (Xiamen Green Cross 2016). It had a mixed reputation in Xiamen due to its controversial decision of three-no's ("no support, no opposition, and no organization") during the Xiamen anti-PX protest in 2007,

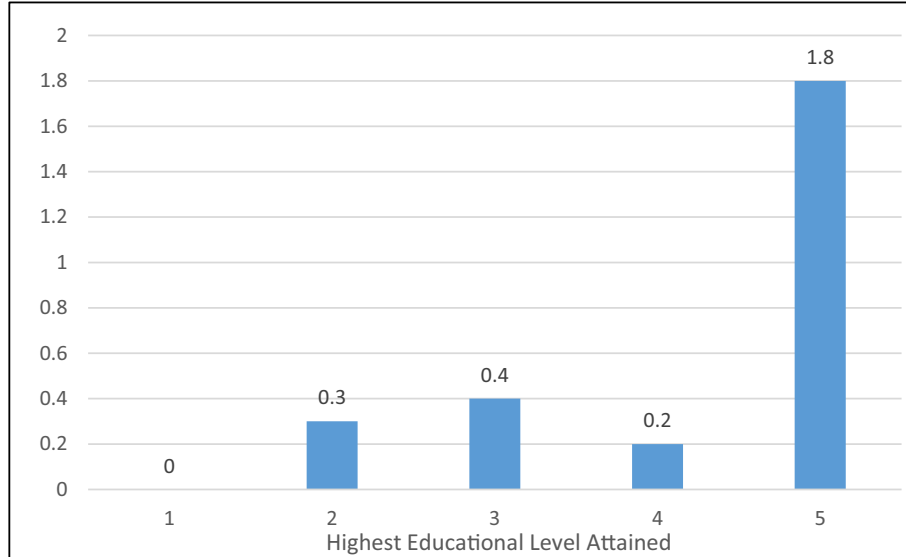


Figure 1: Percentage of Active Memberships in Environmental Organizations.

Source: World Values Survey Wave 6: 2010–2014, China.

1 = no formal education; 2 = complete primary school; 3 = complete secondary school: technical/vocational type; 4 = complete secondary school: university-preparatory type; 5 = university-level education with degree.

the first environmental protest that succeeded in forcing the relocation of a PX project in China (Ansfield 2013). The association's choice to remain neutral despite a terrifying threat to the city's environmental well-being gave rise to serious questions about its legitimacy as an environmental organization. However, Xiamen Green Cross has gradually recovered its reputation over the years with more environmental protection activities.

Given that our whole survey focused on environmental issues, we assumed initially that this test might work against our hypothesis, since students could expect Xiamen Green Cross was an environmental organization due to the context of the survey questionnaire. The data surprised us by showing that only about 10 percent of students (15 total) had heard about it and about 10.6 percent (16 total) knew it was an environmental NGO. The data showed that one of the 15 students who had heard about Xiamen Green Cross did not know what its work was; two students who had not heard about it nevertheless answered the question, saying it should

be an environmental NGO. This seems to be speculation based on the context of the survey questionnaire. The data supports our hypothesis that there is a lack of connection between environmental NGOs and university students. If university students have never even heard about the environmental NGOs active in their area, it is certainly not very likely that they would ever get involved or become members. If these environmental NGOs cannot draw participants from the most highly educated segments of society, how can they expect to succeed in their mission to effectively safeguard the natural environment through civic engagement?

Conclusion and Implications

This study documents China's efforts to build its formal environmental education system and also explores university students' environmental knowledge and awareness using a survey carried out at Xiamen University in 2015—about a decade after China's formal environmental education system was established in 2003. History shows that China made rapid progress in setting up environmental studies in its higher educational institutions, but it took China over two decades to build a nationwide curriculum for primary and secondary schools that included environmental studies. Our survey data revealed that these efforts bore fruit, as indicated by the statistics. For instance, 89 percent of college students learned about environmental issues during their formative years. When they were in high school, 98.7 percent of students in total had heard about global warming issues. University students' overall environmental knowledge improved when compared with the results from a survey carried out in 2007. Gender and the level of development in students' home provinces showed no effect on their environmental knowledge. Students showed positive environmental awareness in five out of six occasions—except for their slight preference for using private cars over public transportation. Students lacked awareness of environmental NGOs, which may help explain why the membership of environmental organizations in China is low even among the most highly educated groups in the country.

This data is generally promising for China's environmental future, given the trend of improvement in environmental knowledge and positive environmental awareness among university students. Yet knowledge and awareness do not automatically translate into behavior. To summarize this critical issue, there is a low

percentage of membership in environmental NGOs among highly educated groups –herein lies the gap between knowledge and action. Environmental protection is still a very fragmented effort in Chinese society. Coordination between NGOs and students is much needed. The Chinese state should expand its efforts beyond formal environmental education to further cooperation between different groups and thus move closer toward achieving its goal of an “ecological civilization.” This kind of shift in state policy might help strengthen China’s chances to eventually fulfill its potential to become a global leader on environmental issues.

Competing Interests

The author has no competing interests to declare.

References

- Ansfield, Jonathan.** 2013. “Alchemy of a Protest: the Case of Xiamen PX.” In *China and the Environment: The Green Revolution*, edited by Sam Geall, 136–202. London: Zed Books.
- Eckersley, Robyn.** 2012. *Global Environment*. Edited by Michael Cox and Doug Stokes. New York: Oxford University Press.
- Griffiths, James.** 2017. “Can China Pick Up US Slack on Climate Change?” *CNN*, March 29, 2017. Accessed August 13, 2018. <https://www.cnn.com/2017/03/29/asia/china-trump-climate-change/index.html>.
- He, Xueqin, Ting Hong, Lan Liu, and John Tiefenbacher.** 2011. “A Comparative Study of Environmental Knowledge, Attitudes and Behaviors among University Studies in China.” *International Research in Geographical and Environmental Education* 20(2): 91–104. DOI: <https://doi.org/10.1080/10382046.2011.564783>
- Hilton, Isabel.** 2016. “With Trump, China Emerges As Global Leader on Climate.” *YaleEnvironment360*, November 21, 2016. Accessed August 13, 2018. https://e360.yale.edu/features/with_trump_china_stands_along_as_global_climate_leader.
- Hu, Hengkui,** et al. 1998. “Analysis of China’s Current Environmental Education System in Higher Education.” *Environmental Science Journal* 18(6): 586–592.
- Jing, Jun.** 2010. “Environmental Protests in Rural China.” In *Chinese Society: Change, Conflict and Resistance*, edited by Elizabeth J. Perry and Mark Selden. New York: Routledge.

- Kong, Deyu, Egil Ytrehus, and Anne Jarmot Hvatum.** 2014. "Survey on Environmental Awareness of Shanghai College Students." *Environmental Science and Pollution Research* 21: 13672–13683. DOI: <https://doi.org/10.1007/s11356-014-3221-0>
- McBeath, Gerald A., Jenifer Huang McBeath, Qing Tian, and Yu Hang.** 2014. *Environmental Educaiton in China*. Northampton, MA: Edward Elgar. DOI: <https://doi.org/10.4337/9780857933508>
- Nadkarni, Vidya.** 2013. "Introduction." In *Emerging Powers in a Comparative Perspective*, edited by Vidya Nadkarni and Norma C. Noonan. New York: Bloomsbury.
- Palmer, Joy A.** 1998. *Environmental Education in the 21st Century: Theory, Practice, Progress and Promise*. London and New York: Routledge.
- Qu, Geping.** 1993. *The China Council for International Cooperation on Environment and Development*, May 8. Accessed August 13, 2018. http://www.cciced.net/dxhd/nh/1993nh/nhxw/201210/t20121019_84398.html.
- Qu, Geping.** 2006. <http://culture.people.com.cn/GB/40462/40463/4007648.html> (accessed August 13, 2018).
- Sohu.** News. August 31, 2006. Accessed August 13, 2018. <http://news.sohu.com/20060831/n245100284.shtml>.
- Tian, Youyi, and Jingwei Li.** 2016. "Forty Years of Environmental Education in China: Development, Difficulties and Recommendations." *Jiangnan Academic* 35(6): 85–91.
- Wong, Koon-Kwai.** 2003. "The Environmental Awareness of University Students in Beijing, China." *Journal of Contemporary China* 12(36): 519–536. DOI: <https://doi.org/10.1080/10670560305472>
- WVS.** "Wave 6." 2010–2014.
- WWFChina.** 2005. News. April 29. Accessed August 13, 2018. <http://www.wwfchina.org/pressdetail.php?id=198>.
- Xiamen Green Cross, Association.** 2016. Accessed September 14, 2016. <http://xmls.xingongyi.org/>.
- Zhang, Chris.** 2017. *The Diplomat*, 11 15. Accessed August 13, 2018. <https://thediplomat.com/2017/11/canred-china-really-be-the-worlds-new-green-leader/>.

- Zhao, Lingyun, Lianhui Zhang, Xinghua Yi, and Jianzhong Zhu.** 2014. *Paths to Ecological Civilization Construction with Chinese Characteristics*. Beijing: Chinese Finance and Economic Press.
- Zhou, Hongchun.** 2008. "Can Red China Really Be the World's New Green Leader?" *The Diplomat*, November 15, 2017. Accessed August 13, 2018. <http://thediplomat.com/2017/11/can-red-china-really-be-the-worlds-new-green-leader/>.
- Zhu, Huaixin, and Justin Dillon.** 2001. "Education for Sustainable Development: A Sino-English Comparative Study in Environmental Education." *Journal of Zhejiang University (Science)* 2(3): 342–347. DOI: <https://doi.org/10.1631/jzus.2001.0342>

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