Sustainability competencies for rural development: Student responses to a challenge-oriented research and training project at two Chinese universities

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Abstract

For UK sustainable development goals (SDGs), higher education plays vital role in cultivating sustainability competences (SCs) for future leaders. Depending on the contexts of geographic locations and university-community partnership, different people may have different definitions on SCs, which influence the adjustment of its pedagogic approach and curricular reform. Based upon a completed Global Challenge Research Fund participation Pilot Project in rural China, we argue challenge-oriented thinking should be put into the top of SCs so that university staff and students can open mind to learn voices, challenges and good practices from multiple stakeholders at grassroots. The necessity of challenge-oriented research and training for rural development can be seen from the responses of participatory students at two Chinese universities. This article sheds new light on university-community partnerships for SCs development.

Keywords: Sustainability, rural development, higher education-community partnerships, China, eco-systems, competences, student responses

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Introduction

Sustainable development goals (SDGs) in higher education play a key role in cultivating sustainability competencies (SCs) for future leaders. Depending on geographic location and cultural perspectives, people may have different definitions of SCs, which affects their pedagogic approach and attitude to curricular reform. Based upon the experience of a Global Challenge Research Fund Pilot Project in rural China, we argue that challenge-oriented thinking should be a priority of SCs so that staff and students may, with open minds, hear voices, meet challenges, and accept good practice from multiple stakeholders. This need for challenge-oriented research and training for rural development may be seen in the responses from participatory students at two Chinese universities. The article sheds new light on university-community partnerships for SCs development.

The United Nations' Sustainable Development Goals

The Sustainable Development Goals (SDGs) attempt to address the global challenges we face, including poverty, inequality, climate change, environmental degradation, which are interwoven. The top two among 17 goals to be achieved by 2030 were the elimination of poverty and hunger. These are tasks for rural development in the developing world that hosts the vast majority of the world's poorest whose livelihoods depend upon traditional subsistence agriculture (FAO, 2019). Towards a better and more sustainable future for all, the SDGs call for participation from all countries and sectors, including Higher Education (HE). The participation of HE in sustainable development can be traced to the UN Decade of Education for Sustainable Development (2005-2014) which states that universities must function as places of research and learning for sustainable development (UNESCO, 2004).

This is because HE plays a vital role in the cultivation of sustainability competencies (SCs) among higher education students, the new generation of intellectual leaders for sustainable development((UNSCO 2017, IAU 2017). This is both curriculum development and a pedagogic issue. The political, economic, social, and cultural diversity of the real world complicates its resolution. Although there is a broad consensus on the SDG's themselves, there are, unsurprisingly, different interpretations of what is effective SCs. As we have indicated, this affects both curriculum and teaching and learning. It is complicated further by the need to achieve successful university-community partnerships. Given that poverty alleviation and food security are the top two priorities of the SDG programme, we argue that the challenges facing rural capacity building in the developing world should be prioritised and integrated into university and higher education curricula as Sustainability Competencies (SCs).

Higher Education and Community Partnerships

The rationale of higher education participation in rural development is part of a global challenge to empower some five hundred million small farmers. These have a crucial role in feeding two-thirds of the population of developing countries, i. e. about 2 billion people. Poverty and food insecurity is caused by multiple and complex factors and require holistic understanding if there is to be an effective intervention. Universities and higher education generally are potentially critical partners in that they can suggest ideas, construct platforms and mechanisms for innovation and implementation by communities and stakeholders. The common objective is to experiment with and demonstrate potential solutions training "sustainability citizens" with appropriate competencies and address the talent shortage in rural communities.

The Global Challenge Research Fund Pilot Project in rural China

The benefits of such challenge-oriented research and training for SCs development in higher education may be seen in a recent project in the poorer areas of China. The project focussed on the development of a cooperative ecosystem to empower small farmers in the alleviation of poverty. China is an instructive example in that nearly half (about 230 million) of the world's small farmer population live there. Since 2007, pro-cooperative government policies have been introduced to help farmers specialise in production and organize themselves for external markets. There has also been a national campaign for poverty alleviation in the poorer areas of rural China (2015-2020) which involves a total of 832 counties, 128,000 villages and nearly 100 million people living below the national poverty line (about 2300-yuan RBM, or USD 1.9 per day). The campaign, led by President Xi Jinping, requested participation and contribution from stakeholders such as government agencies, state-owned enterprises, and public institutions, including universities, to eradicate rural poverty by 2020 (SCIF 2021,). This provided an opportunity to observe and assess the development of sustainable competencies (SCs) among university staff and students.

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Thanks to the United Kingdom's Global Challenge Research Fund (GCRF), a funding programme to support innovative research to address challenges faced by developing countries (https://www.ukri.org/our-work/collaborating-internationally/global-challenges-research-fund/), a pilot project was awarded to the University of Nottingham GCRF[1] to focus

[1] Nottingham GCRF Pilot Project: Supporting cooperatives to empower small farmers in China (RIS 2427898/2180292).

on rural development in Sichuan, a poor, mountainous, and ethnically diverse region of Southwest China.

Map: Location of Sichuan Province in China

The objective was to understand cooperative ecosystems in marginal areas of Sichuan, their impact on livelihoods, and the production organisation of small farmers. A further aim was to create a common platform for multiple stakeholders to improve cooperative ecosystems and support the development of SCs among participating students. Five research groups were established at Sichuan Agricultural University with themes enabling student participation and engagement with community stakeholders, especially farmers. This included potato industrialisation (commercialisation) for poverty alleviation; government intervention for cooperative development; pathways to cooperative leadership; rural finance for cooperative development; entrepreneurship for tourism development in rural ethnic minority areas (Wu *et al*., 2020).

Definition of Sustainability Competencies (SCs)

Sustainability competencies (SCs) are defined here as knowledge, skills, values, and attitudes of students who intend to participate or have already been involved in research, knowledge exchange, and voluntary service to alleviate poverty and sustain rural communities. According to the theme of the GCRF project, SCs contain four elements or dimensions:

- *Challenge oriented thinking:* to hear voices, needs, and opinions of local people and stakeholders about problems, common interests, and coping strategies.
- *A systematic approach:* to see the big picture of challenges and opportunities; the limitation of disciplinary perspectives, and the appreciation of local knowledge.
- *Communication competence:* to conduct meaningful, constructive, and effective communication and dialogue about topics of common concern, among people from diverse backgrounds.
- *Professional competence:* for students to design theoretically informed practical projects for research and dissertations; and the development of writing and other communication skills for non-academic readers.

Survey Findings

Over a hundred students, at all levels (undergraduate, postgraduate, and doctoral) from two Chinese agricultural universities (Sichuan Agricultural University and China Agricultural

University) took part in the project. An online questionnaire (N=59) surveyed students' responses to their personal development of SCs and evaluation of the project.

Table 1 shows that most students joined at least two of these four activities – research group meeting (offline before the pandemic lockdown and online thereafter), methodological salon (all online), field research (online and offline combined), and personal supervision (online) for dissertation, or blog writing. Students who took part in research group meetings and academic seminars accounted for 71.2% each, followed by 61% in field research and 47.5% in papers/blogs writing.

Table 1 Student participation in the GCRF project.

Participation channel	No.	% of respondents
Research group meeting (offline/online)	42	71.2
Methodological salon (online)	42	71.2
Field research (online/offline)	36	61.0
Personal supervision (online)	28	47.5
Total	**148**	***250.8***

The survey shows that the motivations of student's participation in this project were varied and mixed. They include broadening one's academic perspective (84.7%), improving interdisciplinary methodology (61%), field research skills (55.9%), professional skills (47.5%), gaining international project experience (40.7%), and collaboration networking (32.2%).

Table 2 Motivation of participation in this project (multiple choices)

Motivation	% of respondents
Academic horizon	84.7
Interdisciplinary research	61.0
Field research methodology	55.9
Academic writing	47.5
International project experience	40.7
Academic network	32.2

Table 3 is an overview of what students learned from the project. This is shown by multiple choices on ten competence goals. It shows that respondents were positive about all ten competence goals, with an average score of 3.6 out of 5. Indeed, about 80% of respondents agreed that the project improved their competence in "question-oriented research and communications" significantly. This was ranked first with an average score of 4.15. The following competencies also achieved high scores (70% or above): "Open-mind in field research", "Challenge-oriented thinking", and "Importance of local knowledge and grassroots innovation". More than half of the respondents indicated a positive impact on their "academic writing" although less than a half of respondents experienced direct supervision of their research project. In general, the survey confirmed that the project made a significant contribution to the development of sustainability competencies (SCs) by the participating students.

Table 3 Impact of this project on your capacity development (indicate 1 to 5 from low to high)

Competence development goals	**Item selected by respondents (%)**	**Average Score**	**Rank**
Question-oriented research & communication	*79.7*	*4.15*	*1*
Open mind in field research	*74.6*	*3.95*	*2*
Challenge-oriented thinking	*71.2*	*3.90*	*3*
Local knowledge and grassroots innovation	*69.5*	*3.95*	*4*
Representativeness in sampling process	66.1	3.85	5
Ecosystem approach	66.1	3.81	6
Engagement with stakeholders	59.3	3.69	7
Boundary & initial conditions of typical cases	59.3	3.65	8
Cooperatives for empowering small farmers	54.2	3.63	9
Academic research and writing skills	55.9	3.58	10

We also asked the respondents to select the most influential from among four categories of the SCs: challenge thinking, ecosystem approach, communication skills, and professional skills. As Table 3 shows, participation in a research group meeting had an equal impact on SCs development across all four categories, while its influence on challenge thinking was slightly stronger than other items. Over 50% of respondents agreed that methodological training had an outstanding impact on improving interdisciplinary communication skills. The respondents who had taken part in field research said they had improved "communication skills" the most. Improvements in "professional competence" were significantly higher than those in other categories for students who had the opportunity to have individual supervision of personal project design or academic writing (articles or blogs).

Table 4 Which participation helped competence development most significantly? (one for each, %)

Participation \ Competence	Challenge-oriented thinking	Ecosystem approach	Communication competence	Professional competence
Group meeting	**32.2**	20.3	27.1	20.3
Methodological salon	13.6	16.9	**50.8**	18.6
Field research	16.9	25.4	**33.9**	23.7
Supervision	25.4	10.2	20.3	**44.1**

Respondents were also asked to evaluate the whole project according to four categories of SCs using the following rating: Hard to say, Pass, Good, Excellent. **Table** 54 shows that over 90% of the students rated: 'Understand challenges affecting local regions' as Good or Excellent. It also ranked as the greatest improvement, followed by 'Communication competence'. Only 3.4% of students were unclear about their capability improvement after participating in the project, while over 71.2% rated the project as 'Excellent', and 25.4% as 'Good'. This shows that outcomes in student competence development exceeded expectations.

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Table 54 Evaluation of the GCRF project by SC goal and project in total (%)

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SC development goal	Hard to say	Pass	Good	Excellent	Ranking
Challenge-oriented thinking	--	5.1	30.5	66.4	1
Ecosystem approach	3.4	6.8	33.9	55.9	4
Communication competence	--	3.4	30.5	66.1	2
Professional competence	--	5.1	37.3	57.6	3
Overall project	***3.4***	***--***	***25.4***	***71.2***	--

Conclusion

This article draws attention to a novel approach by higher education in identifying sustainable competencies (SCs). The following conclusions are reached.

First, the evidence shows the need for prioritising and integrating challenge-oriented thinking into university research, curricula, and community engagement systems to ensure and enhance SCs for rural development in the developing world, the top priority of the United Nations' Sustainable Development Goals (SDGs).

Secondly, focusing on the challenging issues of rural China, this project demonstrated the feasibility of combining four channels (research grouping, methodological salon, field research, and joint-supervision) to address four SCs goals (challenge-oriented thinking, interdisciplinary perspective, cross-sectoral communication, professional competence). Most of these were delivered through online meetings because of the Covid-19 global pandemic and lockdown.

Thirdly, the possibility of achieving SCs goals was enhanced through the partnership between the University of Nottingham and two Chinese Agricultural Universities with multiple stakeholders with an emphasis on farmers' participation and empowerment. However, in future, a more specific definition of what is required by such a partnership is needed. This needs to be much more sensitive to the local conditions and expertise.

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