Community-based learning for sustainable development: the case of The University of Arizona's Community Garden Initiative

Nataliya Apanovich, Lecturer, University of Arizona
apanovich@arizona.edu
(864) 237 – 3041
3231 N Wilson Avenue
Tucson, AZ 85719

1.   Introduction

The Sustainable Development Goals (SDG) were adopted by the United Nations in 2015 as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity.[1] While the SDGs represent a framework for a sustainable future, their complex and integrated scope and transformational character lead to a lack of a shared understanding of how they can be operationalized.[2]

The literature shows that many approaches have been considered to address this issue. For example, one study proposed six Transformations (education, gender, and inequality; health, well-being and demography; energy decarbonization and sustainable industry; sustainable food, land, water, and oceans; sustainable cities and communities; digital revolution for sustainable development) as modular building-blocks of SDG achievement. Each SDG Transformation describes a major change in societal structure necessary to achieve long-term sustainable development.[3] Other studies focus on the role of a specific sector in achieving the SDGs—private sector[4,5], public-private partnerships[6], local governments[7,8], and higher education[9,10,11,12]. Some suggest that the frameworks and indicators designed to measure the degree of SDG achievement can be beneficial while others say they can be problematic to operationalization of sustainability.[13,14,15,16,17]

While no one approach can ensure desirable levels of SDG achievement, this study focuses on the role of higher education. In 2020, 19.4 million students were enrolled in colleges and universities across the U.S.[18] making up 5% of the country's population.

[1] UN, "17 Goals."

[2] Allen, Metternicht, and Wiedmann, "Priorities for science," 635.

[3] Sachs et al., "Six Transformations," 806.

[4] Rashed and Shah, "The role of private sector," 2931.

[5] Heras-Saizarbitoria, Urbieta, and Boiral, "Organizations' engagement," 316.

[6] Leal Filh et al., "A framework for the implementation," 299.

[7] Guarini, Mori, and Cecap, "Localizing the sustainable development goals" 583.

[8] Krantz and Gustafsson, "Localizing the sustainable development goals through an integrated approach," 2641.

[9] Bento et al., "Education for advancing the implementation."

[10] Christ and Burritt, "Implementation of sustainable development goals," 571.

[11] Leal Filho et al., "Relevance of international partners," 613.

[12] Dias et al., "Competences of sustainable development goals," 73.

[13] Barber and Burgess, "Sustainable development goal indicators," 295.

[14] Calicioglu and Bogdanski, "Linking the bioeconomy," 40.

[15] Hege, Brimont, and Pagnon, "Sustainable development goals and indicators," 423.

[16] Lyytimäki et al., "Risks of producing and using indicators," 1528.

[17] Yumashev et al., "Global indicators of sustainable development," 2768.

[18] NCES, "Undergraduate enrollment."

Considering that higher education positively impacts not only those receiving college degrees but also those around them, operationalizing a path to a sustainable future through higher education has a potential of impacting a lot more than 19.4 million people. Education improves the school-to-work transition, increases lifetime earrings, reduces inequalities. Cumulatively, this builds human capital and addresses such SDGs as education (SDG 4), gender equality (SDG 5), and reduced inequalities (SDG 10).[19] Higher education based on experiential learning can provide even more benefits and address additional SDGs like zero hunger and health.[20,21,22]

The bulk of the literature on the role of experiential learning in achieving long-term sustainability focuses on the development of student competencies in entrepreneurship and business[23,24], leadership skills[25], and forging collaborations[26,27]. These studies relay how the local community, partnerships, and networks can lead to educational and personal outcomes that are rooted in the realities of the global challenges. Through the process of involvement and collaboration on relevant to the community issues, students develop interpersonal and professional skills necessary to deal with them. This study adds to the existing knowledge on the issue by arguing that social benefits of experiential learning in higher education can't be sustainably materialized without first addressing human disconnection from each other and a lack of attachment to land.

Experiential learning can take different modalities and approaches. One of them is community gardening. Community gardening can lead to benefits in many areas ranging from mental health[28,29], to food security[30], to social integration[31,32]. All of these benefits are part of the SDGs. This study focuses on social benefits derived by undergraduate students from volunteering in a community garden. Specifically, a case study of the University of Arizona Community Garden (UACG) is presented as an example of one pathway to long-term sustainability. This study, thus, addresses an important issue of the role of higher education in achieving the SDGs. Additionally, the paper reflects on how such community-based learning initiatives as community gardening encourages and empowers students to become agents of change at the community level.

Overall, this paper demonstrates that engaging students in community-based sustainability programs such as community gardening could advance current discussions about the role of higher education in sustainable development.

2.   Methods

[19] Sachs et al., "Six Transformations," 810.
[20] Caputo, Ligorio, and Pizzi, "The contribution of higher education institutions," 97.
[21] Kioupi and Voulvoulis, "Sustainable development goals," 6701.
[22] Kohl et al., "A whole-institution approach towards sustainability," 218.
[23] Fang and O'Toole, "Embedding sustainable development goals," 100749.
[24] Motta and Galina, "Experiential learning in entrepreneurship education," 103919.
[25] Chineme, Herremans, and Wills, "Building leadership competences."
[26] Appiah-Kubi et al., "Experiential learning as a tool for deep collaboration."
[27] Spicer, Burk, and Mahowald, "Student perceptions of an interprofessional collaboration," 44.
[28] Koay and Dillon, "Community gardening," 6740.
[29] Spano et al., "Are Community Gardening and Horticultural Interventions Beneficial for Psychosocial Well-Being?" 3584.
[30] Hume et al., "Community gardens," 1247.
[31] Jakubec et al., "Planting seeds of community-engaged pedagogy," 102980.
[32] Wood, Barton, and Wicks, "The Impact of Therapeutic Community Gardening," 13166.

In early 2023, all students in the Sustainable Built Environments (SBE) program at the University of Arizona (UA) were provided with an opportunity to volunteer in the UACG. The UACG was founded in 2012 by Students for Sustainability (SFS), the largest student sustainability program at the UA. The UACG "serves as a living laboratory for hands-on green learning and experiences in sustainable practices".[33] It also "provides a unique meeting space on the UA campus that fosters relationship building and closer connections with nature".[34]

The initiative to invite students to volunteer came from the author, who teaches in the SBE program and has a first-hand knowledge of the students' needs and challenges. During the previous semester, it was observed that the students lacked social interaction with each other, had limited knowledge of practical solutions to sustainability challenges covered in coursework, and struggled with mental health.

To address these issues, the author, on behalf of the SBE program, rented three rows at the UACG and invited the students to volunteer once a week for an hour for four months. The author verbally invited the students in her courses, sent weekly emails, and posted on the SBE program's virtual platform. The advertisement of this opportunity lasted for several months.

To assess the role of experiential learning among university students in the advancement of sustainable development, a survey was designed and administered at the end of the semester. Open-ended questions allowed for the solicitation of as much information as possible on the students' expectations, outcomes, and challenges as related to this experience. While more than a dozen students showed up for at least one volunteering session, only six students volunteered consistently. Most of the observations and all survey results came from these six students. Also, the author relied on the university article the participating students wrote about their volunteering experience to compare it to the survey results.

The author attended every volunteering session and observed students' behavior and activities. At the end of each session, the author and the students gathered for informal conversations on any topics the students chose to discuss. To introduce the students to the community and its needs, a community member representing a refugee network organization was invited to the garden. Other faculty members were also invited, with several volunteering in the garden a few times.

3.   Results and Discussion

The students listed multiple reasons for why they decided to volunteer (**Table 1).** Social interaction with peers was the dominant motivator. Several students used interaction with nature as a way to improve mental health as their main motivator. Others expressed a desire to learn something new and to connect their classroom knowledge to the real world.

These responses confirm the author's observations about the students' needs and point to the areas in higher education that need to be addressed. With up to 44% of college students in the U.S. exhibiting symptoms of depression and anxiety, new ways of dealing with the crisis are needed. By being outside in the garden, the students hoped to improve their mental health status and to build relationships with each other. The notion that the

---

[33] UA Community Garden.
[34] UA Community Garden.

exposure to natural world improves health is not new. Many studies demonstrate a link between access to outdoors and human well-being.[35] More recent literature focuses on the link between climate change and mental health. However, with the world becoming increasingly globalized, urbanized, and impacted by climate change, opportunities to interact with the natural world and to do it safely are becoming fewer. Higher education, therefore, needs to incorporate this knowledge into curricula that are rooted in learning based on land, human interaction, and exchange of ideas on how to mitigate climate change.

Table 1 Reasons for why students decided to engage in the UACG, with indicative quotes to provide further insight.

Reasons	Participant quotes
Social interaction	*"I needed a reason to get outside more, socialize with my peers and get to know my professor."* *"I had the time free and really wanted to connect with my classmates better, as I had previously only talked to a few of them and was not friends with many classmates."*
Practical application of university coursework	*"I decided to volunteer at the UACG because of the opportunity it gave me to learn about something new, while also knowing that I am actively helping mitigate all the issues that I am learning about in class."*
To learn new skills	*"[I] took interest in gardening and small-scale agriculture."*
Mental health motivation	*"I wanted to get outdoors, see the sun, and relax my mind from a screen and really learn something hands on."*

Students' expectations of the outcomes of their volunteering experience mirrored the reasons for which they joined the UACG (**Table 2**). Again, they expressed expectations for improved social interaction, mental health, and learning new skills, specifically sustainable agriculture. One student expected to gain access to fresh food and one student expressed no expectations. This points to the urgency of students' needs and a desire to address them by novel means. As was previously stated, incorporating this knowledge in university coursework can allow students to meet their needs in a sustainable way.

Table 2 What students expected to get from volunteering in the UACG, with indicative quotes to provide further insight.

Expectations	Participant quotes
To learn new skills	*"I expected to gain knowledge all about farming sustainably."*
Social interaction	*"Meet and connect with classmates and my professor. Also gain a better understanding for gardening to hopefully try my own in the future."*
Mental health/Food access	*"From this experience, I expected to become more relaxed, make some friends, learn more about agriculture, and maybe even get the chance to eat some of the fresh, organic, produce that we"*

[35] Ma, Moore, and Cleary, "Climate change impacts on the mental health," 114888.

	grow."
No expectations	*"I came into this experience with no intentions, just an open mind and a helping hand."*

The students reported that what they actually got from volunteering (**Table 3**) matched the reasons for why they decided to join and the expected outcomes. What was different is that each student reported more than one outcome and that a component of food security was present in almost all responses. This indicates that land-based learning situated within a community can provide multiple benefits.

Additionally, when asked about what activities the students engaged in, there was a clear divide in answers. Some listed gardening tasks (planting, watering, and weeding) as the activities in which they engaged while others either listed only the social activities (informal conversations during and at the end of volunteering sessions) or combined gardening and social activities together. This points to varied students' perceptions of what they did in the garden and what the garden meant to them. For some, volunteering in the UACG was about gardening while for others the socialization aspect was more important.

Table 3 What students actually got from volunteering in the UACG, with indicative quotes to provide further insight.

Outcomes	Participant quotes
Connection to nature	*"I ended up getting a love for biodiversity. I now appreciate nature more than I ever imagined I would, to the point where I have now even started my own garden."*
Social interaction	*"I actually ended up getting closer with my friends, the helpful nature of the outdoors, and great new opportunities around the garden."*
Mental health	*"I definitely became more relaxed, met some people that I probably never would have met otherwise, and learned so much more about gardening and agriculture in general. I was also able to snag a few really delicious peas from the garden."*
Food security	*"I've learned a good deal about gardening and herb identification. I have also tried a few new leafy greens and plants, which has improved my cooking and eating habits. I've also talked of my fellow SBE peers and learned about the cool things they're doing, becoming friends with them in the process."*
New knowledge	*"A better understanding of gardening and community."*

The volunteering experience contributed to different changes in the students' lives (**Table 4**). Most reported being more socially active as a result of this experience. One reported starting volunteering at another community garden and having an intention to start a charity to address climate change. One reported a plan to start their own garden and another had an intention to start growing vegetables in the dorm. This points to the sense of agency and empowerment the students felt after volunteering in the community garden.

Table 4 Changes the students experienced in their lives as a result of volunteering in the UACG, with indicative quotes to provide further insight.

Changes	Participant quotes
Social interaction	*"The experience has improved my social life and has encouraged me to be more active around campus."*
Community involvement	*"This experience has definitely contributed to changes in my life. Before this experience I had probably only gardened a handful of times, to now where I have adopted my own garden and even have new aspirations to start a charity aiming to help offset global warming."*
New skills	*"Inspired me to start my own garden at home."*
Food security	*"I've met a lot of new amazing people, who I hope to stay in contact with. With food we harvested from the garden, I have also cooked meals I've never tried before and recipes that were completely new to me. Inspired by our gardening, I hope to grow a bunch of plants in my dorm room next year that can act as herbs for my cooking."*
Mental health	*"This experience volunteering in the UA Community Garden definitely changed my life for the better, even if in small ways. I met some really amazing people and gained some additional knowledge about agriculture and the food system in the US. It also helped me cope with the heavy workload that comes with being an Architecture Major in the sense that I was able to escape from the stress for an hour every week."*

Interestingly, when asked what the students learned from this experience, most reported technical skills pertaining to gardening, agriculture, and food systems at large. One student reported that they learned the importance of getting outside of their comfort zone in order to grow: "*I learned that in order to grow as a person you have to take chances. If I had not taken a chance on this opportunity, I would not be in the position I am in now, working every day to make the world a better place through plantings.*" The fact that most students associated technical skills with learning draws attention to the question of what students consider as learning. Because learning in higher education is tightly associated with gaining technical skills, it seems that everything else that is acquired during an education is not perceived as important. This might help explain why there is a gap in higher education when it comes to learning what is not technical, for example social skills and connection to the natural environment and community.

This research highlights the biggest social challenges facing the current generation of students in higher education. Mental health issues combined with social isolation unable students to learn about each other, connect to nature, and become active members of the local community, all of which are necessary for a sustainable future. Without a sense of belonging, the talks about achieving the SDGs are simply unrealistic. According to the Maslow pyramid of needs, people need to first meet their social needs before they can address much bigger issues such as climate change. With one in every eight people in

the world living with a mental disorder[36], a path to sustainability can lie through healing the people. This research shows that experiential learning can address multiple needs at the same time. Students can gain a sense of belonging at the same time as advancing the goals of sustainable development.

What this research also shows is that even a short volunteering opportunity can have a transformative power on the students. The author watched the students turn from quiet and shy individuals to active collaborators and friends. With each session, the students became more engaged with each other and not only in the garden but also outside. They exchanged phone numbers, made plans to spend time together, and talked about their schoolwork. As a result, the students became more active and engaged in their academic program and in the community. They gained a sense of belonging and agency. One student shared that after three years at the university, they felt like they finally woke up and that they needed to continue the volunteering work. As a result, the student joined other community gardens and developed an interest in using native vegetation to address climate change on a local level.

Higher education institutions, especially land grant universities, need to provide education that is community-centered and based on collaborative and experiential learning in order to address the agenda of sustainable development. However, due to many factors, including dwindling public financial support and increased support from the private sector, many universities are threatened by privatization and offer education that is far removed from local community needs and realities.[37]

This paper argues that it is possible to achieve the goals of sustainable development through experiential learning. Only when individuals feel connected to themselves, the natural environment, and the local community can they gain agency to become actors of change. To make this happen, higher education institutions need to reexamine their role in achieving sustainable development goals. First, students need to have access to an education that brings them closer to each other and nature. This can be done through land- and community-based experiential learning with hands on experiences that meet personal and academic needs. Second, such experiences should be incorporated in all programs and majors. Third, universities need to implement this kind of curricula in a way that doesn't put unnecessary burden on faculty. Even though she felt supported by her department, the author felt burdened by the work of planning and materializing this experience. She diverted a lot of her own time and resources to the garden. Such unnecessary burden can discourage many educators from initiating and pursuing similar experiences. To avoid this, universities need to create new units responsible for stream-lining the identification, establishment, and management of community relations and assisting administrators and faculty with the implementation of these relations into academic curricula.

There are several limitations to this study that the author wants to acknowledge. First, the study relies on survey responses from six students only. Such small sample size limits variety and range of experiences that could have been possible with more participants. Second, the students filled out the survey only after volunteering in the garden. Their responses on the perceptions and expectations might have been different had they had an opportunity to share them before the start of the volunteering experience. Third, the

---

[36] "Mental Disorders," WHO.
[37] Just and Huffman, "The economics of universities," 1102.

students' responses to the survey might have been different had this volunteering experience was a mandatory part of their coursework.

4.   Conclusion

This paper analyzed the role of higher education in achieving the SDGs. Specifically, it looked at the undergraduate students' experiences of volunteering in the University of Arizona Community Garden. By engaging the students in community-based and experiential learning for an hour a week for a semester, it was found that the derived benefits were manyfold. The students reported increased social interaction with their peers, a closer connection to nature, improved mental health, increased access to new foods, acquisition of new skills and knowledge, and a greater involvement in the community. Overall, this study indicates that even short and informal experiences like this one can have a transformative impact on the students and the community.

In order to address sustainable development goals, it is recommended that higher education institutions implement more of experiential and community-based learning in their academic programs. Such programs can help remedy poor mental health among college students and provide them with a sense of belonging and agency. A discussion of achieving a sustainable future cannot advance without also addressing the human component.

Bibliography

1. "17 Goals," United Nations, accessed June 15, 2023, https://sdgs.un.org/goals.
2. "Undergraduate enrollment," NCES, access July 20, 2013, https://nces.ed.gov/programs/coe/indicator/cha/undergrad-enrollment.
3. "Mental Disorders," World Health Organization, accessed July 20, 2023, https://www.who.int/news-room/fact-sheets/detail/mental-disorders#:~:text=In%202019%2C%201%20in%20every,the%20most%20common%20(1).
4. Allen, Cameron, Graciela Metternicht, and Thomas Wiedmann. "Priorities for science to support national implementation of the sustainable development goals: A review of progress and gaps." *Sustainable Development* 29, no. 4 (2021): 635-652.
5. Appiah-Kubi, Philip, Melissa McCabe, Vincent Lewis, Rebecca Blust, James Brothers, and Phil Doepker. "Experiential Learning as a Tool for Deep Collaboration Between Business and Engineering Majors." In *2022 ASEE Annual Conference & Exposition.* 2022.
6. Avelar, Aline Bento Ambrosio, Keilla Dayane da Silva-Oliveira, and Raquel da Silva Pereira. "Education for advancing the implementation of the Sustainable Development Goals: A systematic approach." *The international journal of management education* 17, no. 3 (2019): 100322.
7. Barbier, Edward B., and Joanne C. Burgess. "Sustainable development goal indicators: Analyzing trade-offs and complementarities." *World development* 122 (2019): 295-305.
8. Calicioglu, Özgül, and Anne Bogdanski. "Linking the bioeconomy to the 2030 sustainable development agenda: Can SDG indicators be used to monitor progress towards a sustainable bioeconomy?" *New Biotechnology* 61 (2021): 40-49.
9. Caputo, Fabio, Lorenzo Ligorio, and Simone Pizzi. "The contribution of higher education institutions to the SDGs—An evaluation of sustainability reporting practices." *Administrative Sciences* 11, no. 3 (2021): 97.
10. Chineme, Atinuke, Irene Herremans, and Stace Wills. "Building leadership competencies for the SDGs through community/university experiential learning." *Journal of Sustainability Research* 1, no. 2 (2019).
11. Christ, Katherine Leanne, and Roger Leonard Burritt. "Implementation of sustainable development goals: The role for business academics." *Australian Journal of Management* 44, no. 4 (2019): 571-593.
12. Dias, Bárbara Galleli, Raquel Teodoro da Silva Onevetch, Joyce Aparecida Ramos dos Santos, and Gabriele da Cunha Lopes. "Competences for sustainable development goals: The challenge in business administration education." *Journal of Teacher Education for Sustainability* 24, no. 1 (2022): 73-86.
13. Fang, Jim, and Jacqueline O'Toole. "Embedding sustainable development goals (SDGs) in an undergraduate business capstone subject using an experiential learning approach: A qualitative analysis." *The International Journal of Management Education* 21, no. 1 (2023): 100749.

14. Guarini, Enrico, Elisa Mori, and Elena Zuffada. "Localizing the Sustainable Development Goals: a managerial perspective." *Journal of Public Budgeting, Accounting & Financial Management* 34, no. 5 (2022): 583-601.
15. Hege, Elisabeth, Laura Brimont, and Félicien Pagnon. "Sustainable development goals and indicators: can they be tools to make national budgets more sustainable?" *Public Sector Economics* 43, no. 4 (2019): 423-444.
16. Heras-Saizarbitoria, Iñaki, Laida Urbieta, and Olivier Boiral. "Organizations' engagement with sustainable development goals: From cherry-picking to SDG-washing?" *Corporate Social Responsibility and Environmental Management* 29, no. 2 (2022): 316-328.
17. Hume, Clare, Jessica A. Grieger, Anna Kalamkarian, Katina D'Onise, and Lisa G. Smithers. "Community gardens and their effects on diet, health, psychosocial and community outcomes: a systematic review." *BMC public health* 22, no. 1 (2022): 1247.
18. Jakubec, Sonya L., Joanna Szabo, Judy Gleeson, Genevieve Currie, and Sonya Flessati. "Planting seeds of community-engaged pedagogy: Community health nursing practice in an intergenerational campus-community gardening program." *Nurse education in practice* 51 (2021): 102980.
19. Just, Richard E., and Wallace E. Huffman. "The economics of universities in a new age of funding options." *Research Policy* 38, no. 7 (2009): 1102-1116.
20. Kioupi, Vasiliki, and Nikolaos Voulvoulis. "Sustainable development goals (SDGs): Assessing the contribution of higher education programmes." *Sustainability* 12, no. 17 (2020): 6701.
21. Koay, Way Inn, and Denise Dillon. "Community gardening: Stress, well-being, and resilience potentials." *International Journal of Environmental Research and Public Health* 17, no. 18 (2020): 6740.
22. Kohl, Katrin, Charles Hopkins, Matthias Barth, Gerd Michelsen, Jana Dlouhá, Dzulkifli Abdul Razak, Zainal Abidin Bin Sanusi, and Isabel Toman. "A whole-institution approach towards sustainability: a crucial aspect of higher education's individual and collective engagement with the SDGs and beyond." *International Journal of Sustainability in Higher Education* 23, no. 2 (2022): 218-236.
23. Krantz, Venus, and Sara Gustafsson. "Localizing the sustainable development goals through an integrated approach in municipalities: Early experiences from a Swedish forerunner." *Journal of Environmental Planning and Management* 64, no. 14 (2021): 2641-2660.
24. Leal Filho, Walter, Fernanda Frankenberger, Amanda Lange Salvia, Ulisses Azeiteiro, Fatima Alves, Paula Castro, Markus Will et al. "A framework for the implementation of the Sustainable Development Goals in university programmes." *Journal of Cleaner Production* 299 (2021): 126915.
25. Leal Filho, Walter, Tony Wall, Jelena Barbir, Gabriela Nagle Alverio, Maria Alzira Pimenta Dinis, and Julianna Ramirez. "Relevance of international partnerships in the implementation of the UN Sustainable Development Goals." *Nature Communications* 13, no. 1 (2022): 613.
26. Lyytimäki, Jari, Hanna Salo, Robert Lepenies, Leonie Büttner, and Jyri Mustajoki. "Risks of producing and using indicators of sustainable development goals." *Sustainable development* 28, no. 6 (2020): 1528-1538.
27. Ma, Tianyi, Jane Moore, and Anne Cleary. "Climate change impacts on the mental health and wellbeing of young people: A scoping review of risk and protective factors." *Social Science & Medicine* 301 (2022): 114888.

28. Motta, Victória Figueiredo, and Simone Vasconcelos Ribeiro Galina. "Experiential learning in entrepreneurship education: A systematic literature review." *Teaching and Teacher Education* 121 (2023): 103919.
29. Rashed, Abdulkarim Hasan, and Afzal Shah. "The role of private sector in the implementation of sustainable development goals." *Environment, Development and Sustainability* 23 (2021): 2931-2948.
30. Sachs, Jeffrey D., Guido Schmidt-Traub, Mariana Mazzucato, Dirk Messner, Nebojsa Nakicenovic, and Johan Rockström. "Six transformations to achieve the sustainable development goals." *Nature sustainability* 2, no. 9 (2019): 805-814.
31. Spicer, Briana J., Brooke N. Burk, and Megan Mahowald. "Student Perceptions of an Interprofessional Collaboration in an Experiential Learning Setting." *SCHOLE: A Journal of Leisure Studies and Recreation Education* 37, no. 1-2 (2022): 44-54.
32. Wood, Carly J., Jo L. Barton, and Claire L. Wicks. "The Impact of Therapeutic Community Gardening on the Wellbeing, Loneliness, and Life Satisfaction of Individuals with Mental Illness." *International Journal of Environmental Research and Public Health* 19, no. 20 (2022): 13166.
33. Yumashev, Alexei, Beata Ślusarczyk, Sergey Kondrashev, and Alexey Mikhaylov. "Global indicators of sustainable development: Evaluation of the influence of the human development index on consumption and quality of energy." *Energies* 13, no. 11 (2020): 2768.