



University as a Living Learning Lab for Sustainable Futures

Chanita Rukspollmuang*, Pornchai Mongkhonvanit,
Chanida Phitthayanon, Nattiga Silalai, Haritchaya Nubsang
Siam University, 38 Petchkasem Road, Bangwa, Phasicharoen,
Bangkok 10160, Thailand

*corresponding author: chanita@siam.edu

Article Info

Received:
14 March 2022
Accepted:
25 May 2022
Published:
30 June 2022

DOI:
[10.14710/jsp.2022.15467](https://doi.org/10.14710/jsp.2022.15467)

*Selected papers from the
7th International (Visual)
Workshop on UI
Greenmetric World
University Rankings
(IWGM 2021)*

Abstract. *“Leading University Creating Innovation for Sustainable Future”, the vision of Siam University, reflects our commitment to ensure that all learners acquire necessary mindset, skills, values, and knowledge to become co-creators of a more sustainable futures. The vision has been implemented in a whole institution approach. Faculty members, staff, and students are encouraged to integrate sustainable development and SDGs in their academic, research, and engagement activities. The latest survey showed that 2,023 out of 2,152 courses (94%) provided in the academic year of 2020 had integrated SDGs in their content and class activities. In addition, our general education program has been redesigned to serve as “Living Learning Lab (LLL)” for sustainable development projects. This revised program offers many sustainability and sustainability-related courses. They are designed to be interdisciplinary in nature. Teaching-learning activities with emphasis on “living lab” as well as experiential and project-based learning are introduced through team teaching. LLL encourages faculty members and students to work as partners for sustainable development in the surrounding communities which serve as our social living labs. During Covid-19 pandemic, we have to redesign this LLL and rethink from the learnt lessons. Nevertheless, it is our belief that these practices in the “living learning lab” will foster needed sustainability competencies leading to sustainable futures.*

Keyword:

living learning lab, learning ecosystem, sustainable development, sustainability competencies, general education

1. Introduction

We are living in a changing and challenging “VUCA” world especially when we are approaching the 4th Industrial Revolution (4IR), the “revolution” that set to change society and the world we live like never before. The 4IR follows the first IR which allowed production

to be mechanized and drove social changes as people became increasingly urbanized; the second IR which led to mass production; and the third IR which witnessed the emergence of computers and digital technology. The 4IR, a fusion of advances in artificial intelligence (AI), robotics, the Internet of Things (IoT), genetic engineering, quantum computing, and more, has brought changes, challenges and opportunities. It has the potential to improve quality of life for populations around the world but the “revolution” could also lead to greater inequality, disrupt labor markets and escalate social tension [Schwab, 2016]. We are all coping with changes in the 4IR but the drastic challenges come with the Covid-19 pandemic which has profound effects on our future. The world will not be the same and it is thus time for us to seriously think about and act upon “sustainability” and a more “sustainable future” - one where people can meet their needs without compromising the ability of future generations to meet their own needs.

Education has been proven to be a driver force for sustainable development and a key enabler of SDGs. Education for sustainable development and education for sustainable living cannot be postponed. Educational institutions should seek ways to ensure that our stakeholders especially all learners acquire necessary competencies. Hence, learners should be equipped with the five pillars of education, in accordance to UNESCO strategy, learning to know, learning to be, learning to live together, learning to do, and learning to transform oneself and society [UNESCO, 2012, 35]. These pillars emphasize the knowledge, skills, and values needed by citizens to improve their quality of life in a sustainable way and help people from all walks of life to create a more sustainable future.

In order to accomplish this goal, Siam University (SU) has put “sustainability” as one of the three pillars. Recently, we have revised our vision, policies and strategic plans in the attempt to apply the Whole Institution Approaches (WIA) in providing education for sustainable development with respect to socio-economic-environmental wellbeing of local communities and of the people working in campus. This paper summarizes our educational activities related to sustainable development with emphasis on general education program and concludes remarks arising from the COVID-19 pandemic.

2. Transforming Learning for Sustainability: Living Learning Lab Model

2.1. Positioning the University

Sustainability has been implemented for a long time under the guiding principles of Sufficiency Economy Philosophy (SEP) bestowed by the late King Rama IX's and the conceptual framework of UN sustainable development. However, with our aspiration to become a leading “Sustainable University”, Siam University decided to reposition, rethink, and redesign our sustainability goals and practices. A Whole Institution Approach (WIA) to sustainability is implemented in our vision and policies to reflect environmental, social, and economic sustainability. In accordance to our new vision “*Leading University Creating Innovation for Sustainable Future*”, our policy “*Sustainable University, Sustainable District*” and other sustainability policies, Siam university is committed to support initiatives leading to the wellbeing and sustainable living for all our target groups; namely, the 3Ss – students, staff, surrounding communities.

Furthermore, our education provision has also been redesigned in accordance with our new positioning. It was envisioned that the students should learn not only “*education about sustainable development*” but also “*education for sustainable development*”. Learning thus should include real-life issues to enhance students' motivation and learning.

SU academic committee then approved the policy to integrate SD and SDGs in our academic, research and engagement activities. All 14 faculties have agreed to implement as it is reflected in the latest survey in 2020 which showed that 2,023 out of 2,152 courses (94%) provided in our university had integrated SDGs in their content and class activities. Besides, the university has decided to redesign our general education (GE) program in order to assure that all students have knowledge, skills and attitudes related to sustainability and are equipped with needed assistance to move their passion into action. The program was finally developed with participation from stakeholders (the 3Ss + employers) so that they could engage in this decision-making. The new general education was designed to emphasize both SD and SD-related courses and promote transformative learning and the fifth pillar of education proposed by UNESCO.

2.2. Redesigning General Education Program as a Living Learning Lab for Sustainability

Siam University appointed a research team to propose new model for general education (GE) program [Rukspollmuang, et al, 2020]. The team took into account Thailand development policies, stakeholders' needs and also reviewed literature on C/21 skills and sustainability competencies for higher education including the DeSeCo framework of key competencies [OECD, 2005], transversal competencies in education [UNESCO, 2015], and the clusters of sustainability competencies [Wiek, et al., 2011]. Finally, the researchers investigated six key competencies; namely, Normative and Anticipatory Competency, Critical and Innovative Thinking Competency, Inter-personal Competency, Intra-personal Competency, and Literacy. Mix-methods research was employed using document research, expert interview, focus group discussion, and needs assessment questionnaire which was analyzed by Priority Needs Index (PNI) and Modified Priority Needs Index (PNI modified). Data was collected from 440 students and 160 instructors. The top three competencies in each domain could be summarized as follows.

In the Normative and Anticipatory Competency, it was found that both students and instructors ranked "appreciation, understanding, and commitment to apply the principles of sustainable development (SD) and Sufficiency Economy Philosophy (SEP) of the late King Rama IX in daily life and global/social issues" as first priority (PNI Modified = 0.17, 0.36), followed by "appreciation and preservation of Thainess and Thai culture" (PNI Modified = 0.15, 0.34), and "concern, awareness and understanding global/social issues and their impacts" (PNI Modified = 0.14, 0.28). With regards to Critical and Innovative Thinking domain, the results showed that "critical thinking" was ranked first (PNI Modified = 0.21, 0.40) by both the students and instructors followed by "systematic thinking" (PNI Modified = 0.20, 0.40) and "innovative thinking" (PNI Modified = 0.17, 0.31). "Thai and foreign languages proficiency" was ranked as first priority by both students and instructors (PNI Modified = 0.33, 0.45) in Interpersonal Competency. As for Intra-personal Competency, "time management" was assessed as most needed by both students and instructors (PNI Modified = 0.22, 0.44). The students ranked initiative and entrepreneurial spirit as second priority (PNI Modified = 0.21) while the instructors ranked lifelong learning (PNI Modified = 0.43). We further investigated Literacy and found that both students and instructors ranked "legal and political literacy" (PNI Modified = 0.25, 0.39) and "financial literacy" (PNI Modified = 0.21, 0.38) as first and second in this domain. The results of all needed key competencies were shown in Figure 1.

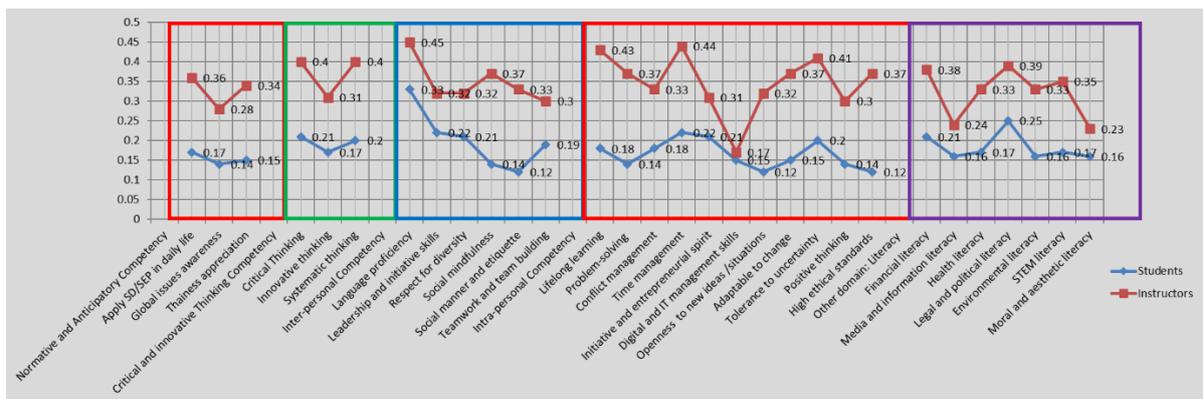


Figure 1. PNI modified of Key Competencies as Perceived by Students and Instructors

Preliminary findings from the research were presented in a focus group discussion attended by faculty members, students, university administrators, employers, and experts in general education. This focus group provided valuable insights and suggestions. Afterwards, the proposed general education curriculum was drafted, revised and developed many times until it was presented to the University Council who gave approval to use this new curriculum in the first semester of academic year 2019.

The new general education program defines “Confidence”, “Social Mindfulness”, and “Lifelong Learners” as desirable characteristics of the students. By “Confidence”, we aim that the students will be confident persons and, at the same time, persons that others have confidence in. “Social Mindfulness” refers to ones who are mindful, have concern and public mind to help others willingly. As for “Lifelong Learners”, we mean that the students will continuously develop themselves to better their work, their lives and keep up with academic advancement. In order to assure the five pillars of education especially the fifth one “learning to transform oneself and society”, this new GE shall be provided under the principle of “Freedom and Wisdom”. There will be less required courses allowing students to have more freedom in choosing any courses interested to them.

Moreover, it was agreed that courses provided should be interdisciplinary, follow principles of SEP and SD and aim to implement the 17 SDGs. This revised GE curriculum offers many sustainability and sustainability-related courses such as Sufficiency Economy Philosophy for Sustainable Development, Community Explorer and Service Learning, Green Technology for Sustainable Development, Living Lab for Campus Sustainability. Innovation is also promoted in various courses such as Logic and Design Thinking for Innovation and Start Up, Entrepreneurship and Innovation.

It is noteworthy that the concept of “Living Lab (LL)” is also integrated. A “Living Lab” is a new way to deal with community-driven innovation in real-life contexts. Although the concept is understood and applied in several different ways within tertiary education sector, at its heart, Living Lab aims to establish partnerships or programs which connect academic activities of the institution with non-academic partners. These partners can be university internal operations, local communities, government, non-government, private and other organizations. It can be best described that “A Living Lab initiative hosts projects where participants from different backgrounds partner to collectively address real-world sustainability challenges and opportunities. In a Further and Higher Education (FHE) institution, Living Lab projects form bridges of collaboration between students, academics, professional staff and external stakeholders. This exchange is the unique characteristic, or

'selling point', of the Living Lab; it combines an institution's intellectual potential with practical sustainability challenges on- or off-campus. It dissolves boundaries between the traditionally segregated activities of education; research; external engagement; and operational & administrative practice. Projects organized through a Living Lab provide a powerful and immersive experience for all. They are a practical, meaningful and engaging way to connect the siloed stakeholder groups of an institution" [Waheed, 2017, 1] He also affirms that a LL can have a profound impact on the core areas of an institution's work by dynamically involving all the key stakeholder groups to pool resources and collectively solve common problems. The valuable outcomes include enriching educational outcomes and experience for students, impactful and innovative learning, teaching and research opportunities for academics, improvement of physical and administrative operations for professional staff, and meaningful and mutually beneficial engagement with external stakeholders. Siam University practices Living Learning Lab (LLL) in two ways – campus as a living lab and community as our (social) living lab. According to this approach, General Education Program has been redesigned to be the LLL for sustainability of the university.

2.3. Building Learning Ecosystem for Living Learning Lab

The National Research Council of the National Academies [cited in Hecht and Crowley, 2019, 3] defines a learning ecosystem as: *"the dynamic interaction among individual learners, diverse settings where learning occurs, and the community and culture in which they are embedded."* They suggest that it includes people (youth, family, educators, funders, etc.); places (schools, libraries, community centers, museums, hospitals, etc.); activities/resources (internships, programs, curricula, books, internet); and intangibles (politics, social services, the history of education in a community, culture) [ibid, 5]. Others such as SEAC (Southeast Asia Center) [2018] proposes that the 4 elements of learning ecosystem comprise Mindset, Blended Learning, Learning Culture, and Learning Environment. HLEE (Holistic Learning Educational Ecosystem), proposed by Koul and Naya [2021, 102-109], confirms that the learning ecosystem enhances student learning experience supported by the pillars—policy-makers, institutes and academicians. They insist that HLEE help transform students from a passive recipient of information to an active participant in a personal learning process. Facilitated, coached and mentored by the faculties, students construct their knowledge actively rather than just mechanically ingesting knowledge. Blended use of technology and classic teaching methods will empower the students to apply active learning and sharpen thinking, taking on skills and abilities better suited for today. This blend will also promote collaboration with peers, faculty and administrators worldwide, and will foster discussion and teamwork. Continuous consultation with faculties and subject-matter experts will enable learners to shape their learning path. This process will allow them to build knowledge based on their previous knowledge or experience, and their acceptance of the new information. With the implementation of HLEE, institutes will focus more on building the knowledge workers fit for the future world. The concept of learning lab and learning ecosystem fit well with sustainability initiatives and it is the role of education for sustainable development to assure that students can think and act for themselves and with others to work on a more sustainable world. At Siam University, learning ecosystem in providing General Education Program which serves as our "Sustainability Living Learning Lab" has been planned and provided.

Some key elements of SU learning ecosystem for general education program – our

“Sustainability Living Learning Lab” - can be summarized as follows.

2.3.1. The People.

Independent Group of Scientists, United Nations emphasizes that *“For sustainable development, the greatest asset is people. They need to be empowered and engaged in community life to enjoy a high level of satisfaction with life and to age in dignity and good health. If they are to cope with emerging technologies, they need the necessary capacities”* [Independent Group of Scientists, 2019, 42]. General education as a living learning lab thus should empower capabilities for transformation. “People” for GE program in Siam University then involve learners, faculty members, staff and local citizens in surrounding communities.

The learners are the prime focus of the learning ecosystem. Our GE program takes into regards UNESCO suggestion that the fifth pillar of education “Learning to Transform Oneself and Society” should be emphasized to promote sustainable development. Learning to transform will be enriched when individuals and groups gain knowledge, develop skills, and acquire new values as a result of learning. They are also equipped with tools and mindsets for creating lasting change in organizations, communities, and societies. In transforming oneself, SU aims to nurture sufficiency thinking and growth mindset in addition to equip them with the key competencies for C/21 and sustainability found in the above research. As for transforming society, we follow our “Sustainable University, Sustainable District” policy to work for the wellbeing, sustain, and livable communities in Phasi Chareon district where we are situated. Most importantly, the university has initiated the UPC4Local-SDGs or University-Public/Private Sector-Community for Local SDGs as an action model to achieve the sustainable goals (see Rukspollmuang and Reynolds, 2021). It is expected that our students will be empowered to engage and assume active roles, both locally and globally, to face and to resolve global challenges and ultimately to become proactive contributors to creating a more just, peaceful, tolerant, inclusive, secure and sustainable world.

2.3.2. Pedagogy and Delivery Methods

Pedagogy describes the practice or method of teaching. Having reoriented our GE curriculum towards sustainability, SU rethink about how the “People” will learn, relearn, and unlearn. Learning should stimulate and promote identified core competencies as well as inspire to take responsibility for present and future generations. Hence, the mode of delivery of education should evolve from an instructor-led model to interactive, learner-centered and action-oriented learning. This entails a shift from “curriculum-based” to “problem-based” learning, which in turn comprises a rethinking of the content, process, and motivations for learning. Learning and teaching activities should therefore be designed to enable exploratory, action oriented and transformative learning. It should become more contextual, situated in real life situations or problems or questions which suggests in turn different reasons for learning and a more organic relationship of learning to other needs and interests. Project-based learning, experiential learning, community/place-based and service learning should be promoted. The delivery can be facilitated by other methods such as using blended learning tools and hybrid learning. With regards to the living learning lab approach, SU has taken campus operations as a living laboratory for learners to learn about sustainability. Students can use the campus and buildings as a living laboratory to do course projects on sustainability issues in the university, recommend their implementation and impacts as part of course work. In

another way, the students can use local communities as (social) living labs to help them become more sustainable and develop solutions to sustainability challenges.

2.3.3. Learning Infrastructure

Human and physical infrastructure are crucial for living learning laboratory. While the students have become much more active and responsible, rather than being a passive recipient of knowledge, faculty members or instructors should be more facilitators, coaches, mentors rather than knowledge providers. They should act as instructional designers, learning engineers or learning experience co-designers. To facilitate multiple roles, faculty needs to be skilled in advanced pedagogy, process digital competencies and be able to handle coping skills with the learners, as well as act in a global connect. In addition, because GE courses are designed to be interdisciplinary, team teaching should be assigned. As for physical infrastructure, the university assists in building flexible learning environment and providing needed technology and facilities that promote learning for sustainability.

2.3.4. Learning Community

A learning community consists of a group of people (students, staff, university administrators, community members and other partners) who share common goals and attitudes and work collaboratively to meet the desired goal - sustainability. Learning communities convene change agents across sectors, disciplines, and maybe geographies to connect, share ideas and results, and learn from each other. Communities may work together in-person and virtually. It sets goals, measures, and reflects collective progress to meet the expected outcomes. In sum, it enhances students to move “From Passion to Action”. In providing general education program, Siam University recognizes the importance of partnerships for change and transformation. Students and faculty members are inspired to take action in real-world learning. We thus harness partnership and collaboration (academic and beyond), in and out of campus. It is hope that this learning community will help promote desirable learning culture leading to practices for wellbeing and sustainability.

3. Concluding Remarks: Lessons Learnt from COVID-19 Pandemic

General Education (GE) program has been redesigned to be a prime vehicle in fostering sustainability and sustainable futures. The research-based program was developed under participatory approach from students, staff, administrators, employers, community members and scholars. Living Learning Lab (LLL) Model was integrated in GE to enhance the provision of pillars of learning, especially the fifth one “Learning to transform oneself and society” which is imperatives for providing education for sustainability. LLL in GE has been practiced in Siam University in two ways – using campus as a living lab and engaging communities as our social living labs. Learning ecosystems consist of people, pedagogy and delivery methods, learning infrastructure, and learning community have been enforced.

The proposed LLL model has been actively practiced in our GE program since academic year 2019. We have built a strong partnership with partners in public and private sectors and local communities. Our activities and initiatives relating to sustainability in the LLL, both campus living lab and social living lab, designed from GE courses are doing well. However, the university was affected by the first wave of COVID-19 pandemic in early 2020 and the second wave in early 2021. The pandemic truly disrupts our learning ecosystem. It forces us

to change LLL delivery modes into technological-based learning. Our learning community mainly works virtually using online platform. Necessary digital infrastructure has been supported by the university but there are some concerns in “digital-divide” among students, faculty members, staff and our partner communities. Nevertheless, a valuable lesson was learnt from the pandemic – that economic, social, and environmental sustainability will not be achieved unless we emphasize more on “human sustainability”. Fortunately, we have followed the late King Rama IX’s Sufficiency Economy Philosophy (SEP) which put the middle way or moderation at the heart. It helps us cope with all difficulties occurred. Human capacity, skills, and mindset can support the functions and sustainability of the organization and promote the wellbeing of communities and society. LLL in GE will be a good exemplar for capacity building. Building capacity for human sustainability through learning should be the prime task of a university and should be provided continuously. Keep in mind also that “learning is a journey, not a destination”.

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