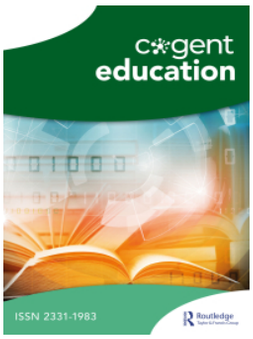

Cogent Education

ISSN: (Print) (Online) Journal homepage: informahealthcare.com/journals/oaed20

Sustainability training in business education in Thailand

Nattavud Pimpa

To cite this article: Nattavud Pimpa (2023) Sustainability training in business education in Thailand, Cogent Education, 10:2, 2245627, DOI: 10.1080/2331186X.2023.2245627

To link to this article: https://doi.org/10.1080/2331186X.2023.2245627

cogent education

Sustainability training in business education in Thailand

Nattavud Pimpa

Cogent Education (2023), 10: 2245627

Pimpa, *Cogent Education* (2023), 10: 2245627
https://doi.org/10.1080/2331186X.2023.2245627

cogent education

EDUCATIONAL LEADERSHIP & MANAGEMENT | RESEARCH ARTICLE

Sustainability training in business education in Thailand

Nattavud Pimpa[1*]

Received: 21 June 2023
Accepted: 02 August 2023

*Corresponding author: Nattavud Pimpa, College of Management, Mahidol University, 69 Vipavadi Rangsit Road, Payathai, Bangkok 10400, Thailand
E-mail: nattavud.pim@mahidol.ac.th

Reviewing editor:
Serafina Pastore, Education, Psychology, Communication, Università degli Studi di Bari Aldo Moro, Italy

Additional information is available at the end of the article

Abstract: While the majority of universities teach all students essential knowledge areas related to sustainability theories and practices, we are still unaware of the sustainable skills our students will need in the future. In an effort to improve the manner in which we design sustainability courses that enhance future skills for all students, we developed a two-step study method. First, we investigated the structure and key features of three universities' sustainable courses. Then, utilizing the knowledge gained in phase one, we redesigned the instrument for data collection and investigated the experiences and expectations of undergraduate students regarding the programs. We conducted three focus group interviews with fifteen undergraduates enrolled in a sustainability unit as a general elective course. Thai students enroll in sustainability programs and/or units for the following reasons: (1) sustainable employment preparedness, (2) future sustainable skills, and (3) relevance to their primary study. When we asked them what encouraged them to learn sustainability effectively, they identified multidisciplinary nature and digital skills as crucial. The majority of students participating in this initiative state that they anticipate that learning about sustainability and sustainable development will enhance their understanding of future careers. In addition, the majority of them anticipate acquiring and integrating technical (ESG) and global competencies, as well as novel competencies such as environmental analysis, sustainable finance and investment, global politics, and social impact assessment.

ABOUT THE AUTHOR

Nattavud Pimpa

Nattavud Pimpa is Chair in Managing for Sustainability and Associate Professor in Management at the College of Management, Mahidol University. He also served in the National Gender Equality Committee in Thailand.

Subjects: Environment & the Developing World; Sustainability Education, Training & Leadership; Curriculum Studies

Keywords: sustainability learning and teaching; undergraduate students; learning spaces

1. Introduction

Sustainability has risen to prominence in recent years, prompting many higher educational institutions (HEIs) to launch sustainability programs and offer courses on the topic. HEIs are a significant force in shaping a society's awareness, knowledge, skills, and values. As such, they bear a tremendous responsibility for advocating and promoting a sustainable education and lifestyle (Fonseca et al., 2011).

In recent years, the sustainability movement in higher education has made significant progress (Fülöp et al., 2022). This is due to challenges we are facing from various perspectives. Global pandemic and disruption of human activities during the COVID-19 crisis, war in Europe, and the climate change situation have been worsened and caused a lot of individuals casualties. These cascading and interlinked global crises call upon the aspirations to ensure that sustainable mindset and lifestyle is promoted since young age.

At the global level, HEIs have been integrating sustainability concepts and knowledge into their core activities (i.e. teaching, research, community services). It is suggested that HEIs may need to integrate their sustainability actions and educational activities with those from private sector (Biancardi et al., 2023). This action will help HEIs to be relevant to global sustainability, and be able to create workforces for the future skills (Novy et al., 2021; UNESCO United Nations Educational, Scientific and Cultural Organization, 2023).

Knowledge in a specific discipline, as well as other fundamental or interrelated competencies, are essential, but must be acquired through specific courses in higher education. To instill the sustainable mindset to younger generation, the UNESCO (United Nations Educational, Scientific and Cultural Organization) (2020) suggested that sustainable education at all levels should support students to obtain knowledge, skills, values and agency to address interconnected global challenges including climate change, loss of biodiversity, unsustainable use of resources, and global inequality.

HEIs' adoption of sustainability concepts and practices needs further investigation to determine how sustainability education helps meet SDGs in different situations by different institutions. Alvarez and Rogers (2006) described three dominant emphases of higher education sustainable development (HESD) curriculum. They include (1) the definitions, history, and meanings, (2) implementation of sustainable concept, and (3) the discourse of sustainability. These three basic curricular positions, although not comprehensive of all sustainability curricula in HESD, serve as a basic framework for examining various approaches to teaching and learning HESD (Wiggins & McThighe, 2005). Nevertheless, the adoption of sustainability concept by different disciplines may lead to confusion among academics who may fail to understand this importance prior to joining the class. At present, the curriculum of sustainable development emphasizes the significance of climate education and ESG framework (Ramirez, 2020).

1.1. Sustainability in the business education

Business schools in the HEIs are among educational actors attempting to incorporate sustainability issues, from environment to social aspects, into the curricula. They are under increased scrutiny to act responsibly and mindful of their impact on the world around them, making sustainability education for aspiring business leaders more crucial than ever.More than 800 business and management schools worldwide have committed to adhering to the Principles for Responsible Management Education (PRME) outlined by the United Nations Global Compact. These principles were drafted in 2007 and require

signatory institutions to provide annual progress reports. All business schools, under PRME guidance, aim to cultivate the next generation of sustainable development leaders, policymakers, and decision-makers more than any other sector of society.

The common key characteristics of sustainability education in business schools include (1) an authentically interdisciplinary curriculum, (2) transformative, experiential learning, (3) instruction on how ecological health and society informs policy and ethics, (4) collaborative learning experiences that focus on enhanced communal relationships; and (5) action research paired with teaching and learning that serves local and global communities are the common key (Nichols & Shorb, 2007).

Responsible business activities can provide a positive impact on society and the environment. This includes lowering pollution levels, boosting the economy, narrowing income gaps, and enhancing the quality of life for all (Brzezicki & Jasiolek, 2021). Skills to manage sustainable business must be well-designed for the diverse business context and industries.

1.2. Business schools and sustainability

Business education for a sustainable future is intricate. There is a perpetual argument about whether or not business practices can be truly sustainable. Researchers in education (Louv, 2008; Ritchie, 2013) agree that experiential learning can help business students understand the complex issue of natural ecological systems, how they interact with complex social and economic systems. Studies by Gamage et al. (2022) and Suh and Han (2019) agree that business schools should equip students of all backgrounds to take action in the face of complex global issues such as climate change, biodiversity loss, resource depletion, and global inequality.

Key competencies to overcome such complex issues in sustainability can be problem solving skill, ability to spot opportunities, entrepreneurial mindset, system thinking, and data literacy (UNESCO, 2023). Evans (2019) referred to system thinking competence, anticipatory competence, normative competence, strategic competence, and interpersonal competence as the essential skills for those who aspire to work in the sustainability area. Indeed, key management skills are related to sustainability issues and good business schools have designed modern and relevant curriculum as a way to show responsibility to society. There are certain things that the literature defines as characteristics of good sustainable business education.

Seatter and Ceulemans (2017) confirm that a good design of sustainable business curriculum from top business schools should be *simple*. Simplicity gives business students of all backgrounds the tools they need to become active members of society and protectors of the environment through their own decisions and participation in collective and individual efforts (Seatter & Ceulemans, 2017).

Secondly, when it comes to the curriculum issue, Ritchie (2013) addresses that the curriculum for sustainable business education that promotes *engagement* with the locals can be helpful for students to learn key sustainability issues, and simplify its complex nature. Ritchie (2013) also confirms that allowing for extended time in the communities and landscapes being studied will help students to *integrate ides* from various disciplines. This will allow time to build rapport with local communities and allows students to step into the day-to-day lives of the communities they are living with and learning from.

Approaches in learning and teaching for sustainability in business schools include face-to-face class, distance learning, online learning, or experiential learning from the community. Business schools must use cutting-edge sustainability educational techniques to prepare business students to make the world more sustainable through in-depth research and creative solutions (Persson et al., 2023). In order to design an effective sustainable business education program for students, we will need to understand their mindset and what they see in “sustainability” in business education.

In sum, the sustainability movement in HEIs has gained momentum in recent years due to the pressing global challenges faced by humanity. The COVID-19 pandemic, wars, and climate change have caused significant casualties and disruptions, highlighting the urgency of promoting a sustainable mindset and lifestyle from a young age. HEIs have recognized the importance of integrating sustainability concepts into their core activities, including teaching, research, and community services. To be relevant to global sustainability efforts and equip students with future-ready skills, HEIs need to collaborate with the private sector. However, the specific ways in which sustainability education in HEIs contributes to meeting the Sustainable Development Goals (SDGs) and the adoption of sustainability concepts by different disciplines warrant further investigation.

The proposed study, therefore, aims to gain a deeper insight into the learning experiences, skills, and knowledge of students dealing with sustainability-related topics. The main research questions in this study include:

- What is the structure and fundamental characteristics of sustainable education in Thai institutions of higher learning?
- How does it (the structure of the sustainability education program) stimulate students' interests in sustainability?
- What are the most influential aspects of their experiences that contribute to their comprehension of sustainability issues in class?

This study is crucial to advance our understanding of how sustainable education impacts the achievement of SDGs and the adoption of sustainability concepts by diverse disciplines. By offering empirical evidence and addressing existing gaps in research, this study will provide valuable insights for policymakers, educators, and stakeholders seeking to strengthen sustainability efforts at both local and global levels. Through its originality and valuable contributions, findings from this study will foster a sustainable mindset among the younger generation and contribute significantly to a more sustainable and equitable future.

2. Literature review

The United Nations Educational Scientific and Cultural Organization (UNESCO, 2023) identifies that Education for Sustainable Development (ESD) aims to develop competencies that enable and empower individuals to reflect on their own actions, and integrating themselves into account their current and future social, cultural, economic and environmental impacts from local and global perspectives.

The need to integrate knowledge and skills on sustainability into higher education is common among stakeholders. Despite the expanding number of classes focusing on sustainability, most of them are electives, and the topics they cover are frequently excluded from the core curriculum, which means that the teachings they teach may be undercut or even contradicted. The multi-disciplinary nature of sustainability can also influence the learning and teaching design and contribute to certain gaps. For students in business to overcome this knowledge gap, it is crucial that students comprehend the underlying worldviews of divergent sustainability interpretations in the context of business (Hopwood et al., 2005).

Studies by Goekler (2003) shows that, in order for business students to learn about sustainability effectively, they must learn to think creatively and actively interact with alternative perspectives. Chiang and Chen (2022) and Tabucanon et al. (2021) also address gaps in the integration of education for sustainable development in the higher educational system. Both papers raise a similar concern on the lack of practical experience among university professors to deliver the concept of sustainability to students. It is critical that HEIs concentrate on the proper delivery and design of knowledge and skills for the current and future sustainable development professions. Studies in this area (i.e. Bonnett, 2002; Chiang and Chen, 2022) also suggest that business and management educational programs should adopt a more holistic, systems-based approach that

challenges students to think about sustainability in terms of a never-ending quest for novel answers. More importantly, trends in education for sustainability tend to focus on the environment, social, and governance aspects (ESG).

2.1. Skills and sustainability education

The capacity to think sustainably and put such thinking into professional practice is increasingly being recognized as a basic competency for business graduates. For graduates to become effective change agents in their workplaces and personal lives, and to build sustainability literacy (Stibbe, 2009), it is important to develop sustainability competences through the process of business education system (Sipos et al., 2008). In fact, there have been attempts to identify required sustainability skills and competencies among current students from various disciplines (Cote, 2021; UNIDO United Nations Industrial Development Organization, 2022). For instance, a study by Rieckmann (2012) adopting a Delphi study in which sustainability key competencies were defined by experts from Europe and Latin American. In this study, systemic thinking, anticipatory and critical thinking emerged as the most relevant competencies for those who work in sustainability area. In a recently conducted literature review and framework proposal (Lozano et al., 2017) a set of 12 sustainability competencies have been identified: systems thinking; interdisciplinary work; anticipatory thinking; justice responsibility and ethics; critical thinking and analysis; interpersonal relations and collaboration; empathy and change of perspective; communication and use of media; strategic action; personal involvement; assessment and evaluation; and tolerance for ambiguity and uncertainty.

The inclusion of sustainability in the relevance of developing key competencies on sustainability has been acknowledged by international agencies such as UNESCO (2023), UNECE (United Nations Economic Commission for Europe) (2022) and for accreditation agencies (ABET, 2023). Table 1 illustrates key skills and competencies for students to accomplish from sustainable education programs.

A few researchers are nearly unanimous in their belief that early introduction to sustainability-based education and the inclusion of multiple actors and fields under a common curriculum is essential. What remains unclear is how to develop different set of skills (i.e. cognitive and behavioral domains) and competencies. Literature emphasizes career and work-related skills and takes other life skills for granted. When it comes to approaches to teach and learn sustainability, previous studies (i.e. Alcaraz et al., 2011; Caldana et al., 2023) agree that increasing students' sustainability literacy, professional skills, and fostering their SDGs requires a multi-modal approach to education that incorporates formal, non-formal, and informal settings.

3. Methods

A combination of data from both primary and secondary sources was used for the analysis. As a secondary source, we collected secondary data from the three undergraduate sustainability programmes in Thailand. Information on the program's objectives, structure, evaluation, and curriculum were used as key points for further investigation. At this point, our attention is focused on laying the groundwork for sustainability education programs in Thailand.

At the second phase, the researcher conducted two focus group interviews with 15 students. They have finished a training program on sustainable development with researcher in July 2021. They have also implemented some ideas on sustainable development goals in their current project at the final year of their degree. There were five students per group, and they are from diverse backgrounds. Table 2 illustrates information of the participants in this study.

All participants completed a training programme on sustainable development in July 2021. They have also incorporated some ideas from sustainable development goals into their present project as part of their capstone requirement for graduation.

Table 1. Key points from the literature in sustainability education and skills

Authors/ Sources	Skills and Competencies	Remarks
Cote (2021) https://online.hbs.edu/blog/post/sustainability-skills	Foundation knowledge (Environment, energy, innovation, waste management) + Leadership Data and analysis Strategic thinking Forward Thinking Creativity Communication	Factors such as employees' happiness, rights, representation, and quality of life, waste produced annually, and carbon emission levels etc. are becoming important.
UNIDO (2022) https://www.unido.org/stories/what-are-green-skills	**Engineering and technical skills**: hard skills encompassing competences involved with the design, construction and assessment of technology usually mastered by engineers and technicians. **Science skills**: competences stemming from bodies of knowledge broad in scope and essential to innovation activities, for example physics and biology. These skills are especially in high demand in each stage of value chains and in the utility sector, which provides basic amenities such as water, sewage services and electricity. **Operation management skills**: know-how related to change in organizational structure required to support green activities and an integrated view of the firm through life-cycle management, lean production and cooperation with external actors, including customers. Such skills are important, for example, for sales engineers, climate change analysts, sustainability specialists, chief sustainability officers and transportation planners. **Monitoring skills**: technical and legal aspects of business activities that are fundamentally different way from the remit of engineering or of science. They refer to skills required to assess the observance of technical criteria and legal standards.	Systemic changes, such as those necessitated by the shift to a low-carbon, resource-efficient economy, will bring about not only new products and services, but also required skills.

(*Continued*)

Table 1. (*Continued*)

Authors/ Sources	Skills and Competencies	Remarks
Biancardi et al. (2023)	Strategic Thinking Value thinking Competency System thinking Future analysis Knowledges on challenges facing society, *- Interpersonal competency Ethics/Values Practical skills	Managerial skills for new business models.
Lozano et al. (2019)	Systems thinking; interdisciplinary work; anticipatory thinking; justice responsibility and ethics; critical thinking and analysis; interpersonal relations and collaboration; empathy and change of perspective; communication and use of media; strategic action; personal involvement; assessment and evaluation; and tolerance for ambiguity and uncertainty.	
United (2020)	There are eight key ESD competencies, namely; 1) Systems Thinking Competence,2) Anticipatory Competence, 3) Normative Competence, 4) Strategic Competence, 5) Collaborative Competence, 6) Critical Thinking Competence, 7) Self-Awareness Competence, and 8) Integrated Problem-Solving Competence.	

Instruments for collecting data were developed by the researcher and research assistants at Mahidol University's College of Management. We examined points from the literature in sustainability and education (UNESCO, 2023). In addition, we had two sustainable development professors weigh in on the instrument's efficacy in terms of clarity and precision.

We were aware of potential risk from focus group interviews, which is a valuable research method. It, however, can create research biases and limitations, such as potential influence from participants' subjective views and group dynamics. To improve the quality of research method, we adopted two actions, they include:

3.1. Skilled moderation

The facilitator of the focus group was trained to manage the discussion effectively. They need to create an environment where all participants feel comfortable expressing their views, manage dominating participants, and encourage quieter participants to share their thoughts.

3.2. Data analysis

Use a systematic and transparent approach to data analysis, clearly documenting the process and methods used. This could include coding techniques, theme development, and data interpretation methods. Clear documentation allows for the analysis process to be audited, enhancing the reliability and trustworthiness of the results.

3.3. Ethics statement

No personal or sensitive information that can be used to identify the respondents were collected. Besides, the consent of the respondents to partake in this study were seek before the data collection process.

3.4. Data analysis

The researcher performed thematic analysis for qualitative data derived from three group interviews on student experiences and expectation in sustainable education, with a focus on understanding the influencing factors behind students' decisions to study sustainability. We began by transcribing and familiarizing ourselves with the interview data. Then, the researcher generated initial codes by identifying and labeling meaningful segments related to influencing factors. Next, we clustered similar codes to form preliminary themes, and iteratively refined and revised these themes through careful analysis. Finally, the researcher interpreted the data, identified patterns, and drew meaningful insights about the types of factors influencing students' decisions to pursue sustainability studies.

3.5. Context of sustainability education for business

A training program for students in this study was designed and organized by an academic team from the College of Management, Mahidol University (CMMU). The objectives of the training program include (1) to provide basic understanding on sustainable development goals and how to apply such knowledge to the real business context, and (2) to promote understanding on responsible business and ethical issues in business, and (3) to support students to understand how to integrate sustainable concept to their future skills.

4. Findings

4.1. Point 1: programs structure and pedagogies

The primary goal was to provide a comprehensive picture of the current state of sustainability in management education in Thailand based on an exploratory empirical analysis of three universities. At the first step of this study, we drew on secondary data from three public universities, including program descriptions, course syllabi, and subject specific details. This stage aimed to shed light on how these elements connect to learning and development in sustainability.

We selected three different types of undergraduate degrees in sustainability: two in the natural sciences and one in the social sciences. All degrees in sustainability in this study provide students with information and skills for environmental knowledge and social studies (i.e. demography, area studies). Economics, environmental studies, business, and soft skills are key elements in all programs. First-year students often begin by examining the overall context (i.e. economics, engineering, and the environment). Further specialized scientific and engineering courses or topics in sustainable economics are offered later in the curriculum.

In all programs we examined, sustainable development ideas are woven into the fabric of the coursework in these programs, with the end goal of instilling a profound appreciation for the interdependence of ecological, social, and economic systems. The emphasis on multidisciplinary study is a defining feature of sustainable educational programs. This implies that students learn about broad issues in economics, social justice, and policy in addition to environmental science. Students can learn the skills they plan to work across disciplines to address challenges in this way, and they can gain a deeper appreciation for the complexities of sustainability issues.

The importance of sustainability as a central theme throughout the entire curriculum is also emphasized. This means that sustainability is not only covered in courses dedicated to the topic, but also integrated into the curricula of every related-field. This method ensures that sustainability ideas and principles are integrated into the curriculum from beginning to end.

In terms of learning pathways, students enrolled in sustainable studies programs learn to contextualize environmental issues within broader systems that may include socio-political, political science, and economic dynamics. In all programs we explored, students will learn to examine such systems and design comprehensive responses to a wide range of environmental and social problems.

Experiential learning, such as fieldwork, internships, and service-learning initiatives, is emphasised in sustainable degrees and courses in Thailand. Students benefit from these experiences because they provide them opportunities to apply what they have learned in the classroom to real-world sustainability concerns, which can then be used in their future professions.

Social and community service learning is commonly emphasised in sustainable degree programmes in Thailand. This is witnessed from students involvement with their neighbourhoods and think about how their work will affect others socially. Sustainable degrees and classes encourage students to work towards a more equal and just world by building a sense of social responsibility.

Students in one of the three programs can choose from two different leadership tracks. It appears that the program's emphasis is on cultivating leaders who can usher in social innovation, which involves instituting reforms to society's underlying institutions in order to boost their economic and social effectiveness.

When it comes to the pedagogical issues, lecture-based education and classroom instruction seem to be common. Some programs provide students with opportunity to gain hands-on experience with sustainability challenges through service learning, field trips, and internships with local, national, and international non-profit organizations. All programs also address the incorporation of technology in environment and social media as key elements for students' learning experiences.

In sum, the well-rounded nature of the programs reconfirm the importance of graduates who are leaders to solve complex sustainability challenges and build a more sustainable future for Thailand.

4.2. Factor driving students to enrol in sustainability course

4.2.1. Sustainable job readiness

We learn that students in this study expect sustainable education program to provide them with practical skills and knowledge that they can apply for future career. They plan to work in the jobs that contribute to the economic, social, and environmental sustainability of a community or region. Students also expect to learn communication skills since they understand that jobs in sustainability area will require workers to be able to communicate effectively with a variety of people, including clients, colleagues, and the public.

When it comes to the relationship between sustainability concept, future job, and daily activities at school or universities, most students expressed that their daily sustainable activities can be greatly influenced by education about sustainability. Some activities they have learnt and practiced can subsequently become potential future skills. One student discusses the concept of food waste and its relationship with future work.

> I understand the concept of food waste from university and it strikes my thought all the time to plan my meals and daily activities. This becomes a good skill for me since I learn planning skills from this class.

> I can discuss environmental issues when I have the knowledge to make sustainable decisions on daily activities such as food, fashion, or fuel.

Most students agree that challenges in climate change, net zero, and the adoption of new concepts such as ESG (environmental, social, and governance issues) and GHG strategy influence them to learn more about future career in sustainability.

Table 2. Information of informants in this study

Group 1	**Gender**	**Discipline**
Student 1	F	Biology
Student 2	F	Business
Student 3	M	Business
Student 4	M	Engineering
Student 5	M	Engineering
Group 2	**Gender**	**Discipline**
Student 6	F	Nursing
Student 7	F	Language
Student 8	F	Biotechnology
Student 9	M	Medicine
Student10	M	Vet science
Group 3	**Gender**	**Discipline**
Student 11	M	Business
Student 12	F	Religious Studies
Student 13	F	Public Health
Student 14	F	Medicine
Student15	M	Dentistry

Most participants in this study anticipate that learning sustainability-related skills will improve their employability in a variety of situations. The more they know about sustainability, the more likely they are to catch the eye of prospective employers and give themselves a leg up in the creation of ideas and technical skills for future sustainable employment.

Preparedness for the specific future sustainable career is also common issue among science and engineering students who enrol in business minor in this study. They expected the education on sustainable business will be relevant to their future science careers and help them to understand the connections between environmental, social, and economic issues. Thus, they will be more attractive in the marketplace.

> Being a science student, I need to understand how sustainable work in science become. I need to learn different aspects of sustainability for my future career.

Most students with business education backgrounds tend to focus on a "mindset of collaboration." This is crucial for the future career when they identify the sustainability and business value chains. Identifying and addressing sustainability challenges and opportunities requires collaboration with stakeholders across the supply chain, including suppliers, customers, and local communities. Such mindset comes with certain skills that will help them to improves interactions with people in the discipline, enhances their job performance, and collaborate sustainably.

4.2.2. Sustainable skills

A number of participants from science and engineering background tend to focus on how to obtain sustainable skills. Sivapalan's study suggests that Malaysian engineering graduates lack sustainability knowledge, competences and values. They often struggle to cope with professional responsibilities that require them to exercise these literacies. Much of this is attributed to the lack of sustainability integration within the undergraduate engineering curriculum, and within teaching approaches used

Professional skills for the green-job or sustainability-related work are mentioned frequently by participants when we discussed their motivation to enrol in sustainable development course(s). The growth of green jobs such as renewable energy, human rights policy analyst, green construction, or social entrepreneurs can influence Thai students to combine sustainability with their main educational programs.

Although the majority of them are in the specific and specialize undergraduate programs such as medicine, nursing, music ect., they feel the urge to develop the new set of skills for the future job. The future skills for them refer to (1) skills that they will have to adapt into their profession, and (2) knowledge on innovation and technologies that support sustainability in all organisations. The participants tend to focus on ability to keep up with technology to improve environmental conditions as well as access to support for all. Issues on new technologies and techniques to reduce human influence on the environment are seen as important future skills for all. Most of them expect that graduates from university must be able to possess such skills, in the same way as ability to operate computer or speak foreign languages. They also expect that skills in new areas of environmental and social technology, such as renewable energy and waste management, will be in great demand.

When we discussed soft skills in sustainability, all participants referred to communication and analytical skills. They understand the global challenges we are facing such as inequality, climate change, loss of natural resources, and poverty. Graduates with cross-cultural communication and collaboration abilities will be crucial to the development and implementation of sustainable solutions in all industries.

Students from business schools discuss the ability to design corporate strategy through their sustainable business activities. Sustainable business skills are what commonly stated by the

Table 3. Student's expectations from sustainable education training

Technical Skills	Soft Skills	Generic Education & Training
• Knowledge of renewable energy technologies and their applications. • Understanding of water conservation and management techniques. • Proficiency in sustainable agriculture and food production methods. • Ability to design and implement sustainable buildings and infrastructure. • Familiarity with circular economy principles and practices.	• Effective communication and collaboration skills to work with stakeholders from diverse backgrounds and perspectives. • Critical thinking and problem-solving abilities to develop sustainable solutions to complex challenges. • Leadership and management skills to inspire and motivate others to take action on sustainability issues. • Flexibility and adaptability to navigate the changing landscape of sustainability.	• Understanding of the environmental, social, and economic impacts of unsustainable practices. • Knowledge of the principles and practices of sustainable development. • Familiarity with the United Nations Sustainable Development Goals (SDGs) and their relevance to sustainability education. • Understanding of the intersectionality of sustainability issues, such as climate change, social justice, and economic development.

students in this study as ability to plan business activities and not compromise with the environmental, resources, and social issues.

The adoption of sustainable practices, such as cutting back on energy and the calculation of water consumption, minimizing plastic use, recycling old products, and a fair system in supply chain can often lead to financial benefits for organizations. In this circumstance, graduates with such skills can help organizations to achieve their financial goals while doing less damage to the environment. Table 3 illustrates points on expectations among students who participated in this program.

4.2.3. Relevance

All participants in this study agreed that they expected to apply new knowledge, technologies, and practices from the training program to their current or future work, When they are equipped with the appropriate information about ESG, methods and practices from the industry, and coordinated abilities, they are more likely to embrace new technologies to their work. There is potential for courses to inspire students to think critically, give them agency, and prepare them to take action on problems they care about, if the sustainability education is relevant to their lives.

Participants in this study also confirm that transdisciplinary learning is provided by sustainable education programs, which emphasize both theoretical and practical components that are relevant to their main discipline and future career. The sustainability program defining work also stressed that trans-disciplinarity entails a critique of typical disciplinary divides, as it simultaneously challenges and exceeds the limits of solving real world problems from within the confines of traditional disciplinary techniques.

> When I enrolled in a sustainability training program, I assumed that the instructors would have a firm grasp on the interdependencies between various fields of study and the ways in which sustainability might be used in business.

The fact that sustainable education leads students to think about "the big picture." When we asked them to define how is sustainability relevant to knowledge and skills, participants agree

upon the interconnectedness among general knowledge, understanding about specific issues, global and local knowledge, current affairs, and ability to identify local and global trends.

> I expect to be able to connect the local and global issues when I enrolled in this course. This course has to be practical to be sustainable.

> Communicating our environment issues in Thailand to the tourists or non-Thai visitors is relevant to my daily life as a student from the environmental studies since we are more global in this era.

An interdisciplinary approach to sustainability education might involve bringing together teachers and experts from science, social studies, and language arts to design a unit on renewable energy. Students might learn about the science of renewable energy, including how solar panels and wind turbines work. They might also explore the economic and social factors that influence the adoption of renewable energy technologies, such as government policies, market forces, and cultural attitudes.

Figure 1. Word cloud on relevance.

Table 4. Relevant issues for sustainability education

Sustainable Social Issues	Sustainable Environmental Issues	Others
Local problems analysis New law and legal issues on sustainability Migrant workers Micro finance skills Basic finance and Pro-poor issues Women and Finance Youth Issues	BCG (Bio-Circular-Green) Green supply chain Green hospital operations Water footprint	• Social fundings for business • Chat GPT/AI and sustainability • International sustainable business

The relevance of SDGs and students' life is evident. Participants define that SDGs emphasize unequivocally that sustainability is about more than simply the natural environment; it is about how that environment is used to improve living in all aspects of their life and society, with a particular emphasis on equality, equity, and social justice. This is relevant to both professional and personal lives. Word cloud from the data under the theme relevance is presented in Figure 1. We also asked students to identify potential learning topics to learn in order to be relevant to the current global situation, job markets, and self-interest. Results are presented in Table 4.

As shown in Table 4, the incorporation of a multi-disciplinary approach in sustainability education programs brings forth several advantages. One notable benefit is the opportunity it provides students to recognize the relevance of sustainability across various dimensions of their lives, fostering a holistic comprehension of the subject matter. By exploring sustainability from multiple disciplinary perspectives, students gain a more comprehensive understanding of its interconnectedness and its significance in diverse contexts. It also encourages critical thinking, problem-solving, and collaboration, as students work together to integrate different perspectives and approaches.

4.3. Factors promoting effectiveness in sustainable learning experiences

4.3.1. Sustainable digital and multi-disciplinary

Participants in this study agree that basic digital skills become important for future employment. They all agreed that throughout their study, digital learning experiences were helpful for them to understand complex issues. They agree that sustainable digital skills enable them to flourish in a future work that digital ecosystem is fast expanding.

The capacity to use digital technology and transfer such skills to personal and professional activities is linked to increased employability opportunities, the promotion of stronger social cohesion and integration, an improvement in quality of life, and a broader knowledge of the past, present, and future of humanity. Digital competencies are essential for achieving in studying new environmental and social issues. Participants agree that the quality of digital learning experiences are useful for them, in particular when it is in the multi-disciplinary mode.

> E-learning by combining our teachers, stories from youtube, and interactive quiz was really useful for us.

Participants also agree that understanding how to obtain and analyze information while maintaining a high standard of integrity as an essential part of developing information literacy, which is described as the ability to recognize the need for, locate, and make effective use of information. Information literacy is related to digital skills in many ways.

Digital skills can be interpreted as the ability to analyze environmental, social, and governance (ESG) data, and ability to include skill-based initiatives into ESG reporting. When participants are asked to define some examples on the relationship between sustainability, digital skills, and multidisciplinary of sustainable education, they discussed digital solutions that can reduce energy consumption, digital technology for supply chain, and technology that saves resources, increases efficiency, and allows the repairability and re-use of products.

> Business schools should adopt ideas from science, communities and include digital literacy to ensuring the long-term viability of society can be achieved through sustainable business education.

> I believe the more we know about technology, the more we can create efficiencies that help the environment stay healthy.

Nearly half of the participants addressed that the traditional business activities always involve heavy resources consumption. They identified activities such as the use of paper, ink, personal travels as irresponsible activities. Business organizations can reduce resources if they allow staff to manage their own resources and provide digital technology options for their staff. This kind of discussion in the class can also help students to think ahead and prepare to change their consumption behavior at early age.

One participant also addressed that online information, e-commerce, and instantaneous communication via mobile technology are all today's examples of digital technologies that contribute to sustainability. Hence, it is what they expected prior to the enrolment.

> CO2 emissions can be cut with the help of digital technologies. By moving resources like software and operating systems to the cloud, we can save energy and cut down on pollution.

> I realize that recently, the demand for digital skills in the so-called green jobs has grown increasingly obvious as the COVID-19 pandemic has compelled many firms to become digital in order to survive.

Learning about sustainability in an interdisciplinary approach is one strategy for effectively implementing sustainability education. This is done so that the many viewpoints on sustainability may be considered, resulting in a more comprehensive understanding of it.

5. Conclusions

This study is important and relevant because it seeks to fill crucial gaps in the existing research on sustainability education in higher education. While the importance of sustainability education is acknowledged, there is a lack of comprehensive research that explores its actual impact on achieving the SDGs and its integration across various disciplines within HEIs.

By investigating how sustainability education in HEIs contributes to achieving the SDGs, the study goes beyond theoretical assertions and provides evidence of the practical outcomes of such educational initiatives. This in-depth analysis offers valuable insights for policymakers and educators seeking to enhance the effectiveness of sustainability education.

Additionally, it assesses the obstacles and prospects associated with integrating sustainability into a comprehensive curriculum. The investigation conducted in this paper into the adoption of sustainability principles across many disciplines provides valuable insights into the challenges that academics may encounter when attempting to comprehend and integrate these ideas. This research contributes to the understanding of problems in cross-disciplinary cooperation and the promotion of a cohesive sustainability agenda in higher education, hence facilitating the development of methods to address these issues.

The establishment of strategic collaborations with the industry is significant as well. The study's examination of the integration of sustainability initiatives and educational activities with the industry is a response to the growing need for novel collaborations aimed at successfully tackling global concerns. Through an analysis of successful partnerships, the suggested model presents a framework that may guide the development of a workforce that is both sustainable and resilient in the future.

Strategic Collaboration with the private sector is also important. The study's consideration of integrating sustainability actions and educational activities with the private sector responds to the increasing need for innovative partnerships to address global challenges effectively. By examining successful collaborations, the proposed model can offer a roadmap for creating a more sustainable and resilient future workforce.

The purpose of this study was to analyze student's experiences in sustainability education among students in a Thai business school. It is done by literacy by investigating what motivates people to study about sustainability and how they learn about complicated sustainability issues.

The Sustainable Development Goals (SDGs), formulated by the United Nations, are widely regarded as the cornerstone of contemporary sustainable education. These goals focus on three fundamental components of sustainability: economic growth; social inclusion; and environmental protection. All of these parts work together to ensure people and communities thrive.

The importance of sustainability initiatives in tertiary institutions has grown as a result of the awareness HEIs generates to students on environmental and social difficulties, the technical support and skill developments for students' understanding of sustainability, and the proactive roles HEIs play in sustainability. HEIs, therefore, will need to fully understand students' expectation and aspiration in sustainable education and training.

This study identifies key common characteristics of courses in sustainability for business students in Thailand. Thailand's business schools need to adopt pedagogy and knowledge in the fields of environmental science, social issues, and management. To be able to manage the uncertain sustainable future, HEIs will need to equip students with technological, entrepreneurial, and digital literacies.

According to Lozano (2017, p. 643), universities could become more "balanced, synergetic, transdisciplinary and holistic" (p. 643) if sustainability is integrated "as a concept, in and among the different disciplines and schools, and tailored to their specific nature" (p. 643). This would allow graduates to become more competent sustainability change agents. This study also confirms that a multidisciplinary approach to sustainable business education can inspire students to take an active role in developing their knowledge of sustainable practices, and incorporating them into their future work on a personal and professional levels.

The analysis of sustainability courses reveals that sustainable courses in Thailand prioritize experiential learning methodologies such as fieldwork, internships, and service-learning initiatives. Students acquire sustainability skills via experiential learning activities, as higher education institutions (HEIs) and their partners provide opportunities for students to engage with real-life circumstances that allow them to apply their classroom knowledge to the community.

Industry associations can help identify needed skills and design their own training initiatives. Instead of developing sustainability training programs alone, industrial partners should collaborate with HEIs and co-design modern sustainability training programs that are industry relevant, timely, and grounded by academic knowledge (Petison & Kantabutra, 2023). More importantly, HEIs and industry should work together to co-design ESG and sustainability training for future workers.

The growth of sustainable jobs is one major factor pushing students to integrate sustainability into their study program. Participants in this study also referred to future skills such as digital skills, data literacy, and environmental knowledge as key skills for future graduates. Connection from the industry can help students to understand complex sustainable issues such as climate neutrality, water footprint, migrant workers management, GHGs, and digital leadership (Fülöp et al., 2023).

This study also shows that a significant and systematic transformation in nearly every aspect of pedagogy for business education is required, if business school administrators are serious about establishing and supporting commitments for sustainable skills and competencies among business students.

We learn that, by incorporating sustainability into both the academic and extracurricular spheres, students are exposed to a wider range of perspectives and interests, and are better prepared to address sustainability as active participants in their communities and workplaces.

Future skills such as environmental analysis, sustainable finance, or social impact assessment will become a part of future business studies.

Sustainability should not only be a required part of all management and business degree programs' curricula, but also a highly sought-after option. To equip students to "take over" the instruments of social power, and use sustainability skills to transform the business, it is necessary to build integrated coursework and extracurricular initiatives that shape the way they learn.

6. Implications and future study

There are certain limitations in this study that the researcher needs to discuss for future research. Although the concentration on Thai institutions help researcher to understand the Thai HEIs context, the exclusive concentration on Thai institutions may impose restrictions on the broad applicability of the research outcomes. To bolster the significance and pertinence of the investigation, it would be beneficial for future researchers to contemplate incorporating participants from a variety of cultural backgrounds and regions. This would yield a more holistic view on the landscape of future sustainable skills, offering insights across varied contexts.

When it comes to careers in sustainability, students who participated in this study may not know details and nature of jobs in sustainability as clearly. Hence, the findings on future sustainable work predominantly centers on technical proficiencies pertaining to environmental analysis, sustainable finance, and global politics. However, broadening the discourse to encapsulate additional facets of sustainability, such as social equity, cultural competence, and ethical decision-making, could enrich the study. These elements are equally imperative when navigating intricate sustainability challenges and hence should be considered in the future research.

The distinctiveness of this research can be attributed to its specific concentration on Thai institutions, its intersectional perspective on sustainability education and Sustainable Development Goals (SDGs), as well as its practical implications and policy recommendations.

Concentration on Thai Institutions: While the domain of sustainability education has been widely researched, this study uniquely focuses on Thai higher education institutions. This offers a novel cultural and institutional setting that remains largely unexplored, thus promising to yield fresh insights and perspectives.

Intersection of Sustainability Education and SDGs: The objective of this study is to probe how sustainability education within Thai Higher Education Institutions (HEIs) contributes towards accomplishing SDGs. The intertwining of education with broader sustainable development indicators presents an innovative methodology to evaluate the effectiveness and pertinence of educational programs.

Practical Implications and Policy Recommendations: The outcomes of this study intend to guide policy, demonstrating a practical, actionable focus. By identifying and addressing existing lacunae and offering empirical evidence, it is well-positioned to influence sustainability strategies at both institutional and broader regional or global scales.

Regarding theoretical implications of the study, there are four aspects to be discussed. First, interdisciplinarity in sustainability education: The discovery that students appreciate a multidisciplinary approach to sustainability education indicates that future theoretical models of sustainability education should incorporate this perspective. This could stimulate the development of new theories or frameworks that promote an integrated and comprehensive understanding of sustainability education, transcending traditional disciplinary confines.

Nexus Between Education and Future Skills: This study substantiates the theory that sustainability education is pivotal in preparing students with future-ready skills. It emphasizes areas of

interest such as ESG (Environmental, Social, and Governance) competencies, environmental analysis, sustainable finance and investment, global politics, and social impact assessment. This could initiate more detailed theoretical explorations on the role of higher education in cultivating future skills and sustainability leaders.

Importance of Digital Skills in Sustainability Education: The findings underline the significance of digital skills in sustainability education, opening the door for additional theoretical investigations into the amalgamation of digital skills and sustainability concepts. The study might stimulate theoretical conversations on the role of digitalization and technology in furthering sustainable development and education.

Motivation for Engaging with Sustainability: The reasons students provided for enrolling in sustainability courses (sustainable employment readiness, future sustainable skills, relevance to their primary study) could enhance theories about students' motivation and engagement in sustainability education. This could offer valuable insights into the application and evolution of motivational theories within the sphere of sustainability education.

In conclusion, this study has the potential to stimulate new theoretical advancements in sustainability education, particularly in areas such as interdisciplinary approaches, the nexus between education and future skills, integration of digital skills, and student motivation.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used Chat GPT in order to compare views of sustainable education from different countries. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

Author details
Nattavud Pimpa[1]
E-mail: nattavud.pim@mahidol.ac.th
ORCID ID: http://orcid.org/0000-0002-9025-5351
[1] College of Management, Mahidol University, Bangkok, Thailand.

Disclosure statement
No potential conflict of interest was reported by the author(s).

Citation information
Cite this article as: Sustainability training in business education in Thailand, Nattavud Pimpa, *Cogent Education* (2023), 10: 2245627.

References

ABET. (2023). Criteria for accrediting engineering technology programs, 2017 – 2018. https://www.abet.org/accreditation/accreditation-criteria/criteria-for-accrediting-engineering-technology-programs-2017-2018/

Alcaraz, J. M., Wiktoria Marcinkowska, M., & Thiruvattal, E. (2011). The UN-principles for responsible management education: Sharing (and evaluating) information on progress. *Journal of Global Responsibility*, *2*(2), 151–169. https://doi.org/10.1108/20412561111166021

Alvarez, A., & Rogers, J. (2006). Going out there: Learning about sustainability in place. *International Journal of Sutainability in Higher Education*, *7*(2), 176–188.

Biancardi, A., Colasante, A., & D'Adamo, I. (2023). Sustainable education and youth confidence as pillars of future civil society. *Scientific Reports*, *13*(1), 955. https://doi.org/10.1038/s41598-023-28143-9

Bonnett, M. (2002). Education for sustainability as a frame of mind. *Environmental Education Research*, *8*(1), 9–20. https://doi.org/10.1080/13504620120109619

Brzezicki, M., & Jasiolek, A. (2021). A survey-based study of students' expectations vs. Experience of sustainability issues in architectural education at Wroclaw University of science and technology, Poland. *Sustainability*, *13*(19), 10960. https://doi.org/10.3390/su131910960

Caldana, A. C. F., Eustachio, J. H. P. P., Lespinasse Sampaio, B., Gianotto, M. L., Talarico, A. C., & Batalhão, A. C. D. S. (2023). A hybrid approach to sustainable development competencies: The role of formal, informal and non-formal learning experiences. *International Journal of Sustainability in Higher Education*, *24*(2), 235–258. https://doi.org/10.1108/IJSHE-10-2020-0420

Chiang, M., & Chen, P. (2022). Education for sustainable development in the business program to develop international Chinese college students' sustainability in Thailand. *Journal of Cleaner Production*, *34*(10), 134045.

Cote, C. (2021). 8 Sustainability skills for working professionals. https://online.hbs.edu/blog/post/sustainability-skills

Evans, T. L. (2019). Competencies and pedagogies for sustainability education: A roadmap for sustainability studies program development in colleges and universities. *Sustainability*, *11*(19), 5526. https://doi.org/10.3390/su11195526

Fonseca, A., Macdonald, A., Dandy, E., & Valenti, P. (2011). The state of sustainability reporting at Canadian universities. *International Journal of Sustainability in Higher Education*, *12*(1), 22–40. https://doi.org/10.1108/14676371111098285

Fülöp, M. T., Breaz, T. O., He, X., Ionescu, C. A., Cordoş, G. S., & Stanescu, S. G. (2022). The role of universities' sustainability, teachers' wellbeing, and

attitudes toward e-learning during COVID-19. *Frontiers in Public Health*, *10*. https://doi.org/10.3389/fpubh.2022.981593

Fülöp, M. T., Breaz, T. O., Topor, D. I., Ionescu, C. A., & Dragolea, L. (2023). Challenges and perceptions on e-learning for educational sustainability in a "New Normality Era". *Frontiers in Psychology*, *14*, 82. https://doi.org/10.3389/fpsyg.2023.1104633

Gamage, A., Ekanayake, S., & Dehideneya, S. (2022). Embeding sustainability in learning and teaching: LEssons leaerned and moving forwards. *Education Sciences*, *12*(3), 225.

Goekler, J. (2003). Teaching for the future: Systems thinking and sustainability. *Green Teacher*, *70*(Spring), 8–14.

Hopwood, B., Mellor, M., & O'Brien, G. (2005). Sustainable development: Mapping different approaches. *Sustainable Development*, *13*(1), 38–52. https://doi.org/10.1002/sd.244

Louv, R. (2008). *Last child in the woods: Saving our children from nature-Deficit disorder, Algonquin Books* (Updated and Expanded ed.). (April 10, 2008). Atlantic Publishing GB (Great Britain).

Lozano, R., Barreiro-Gen, M., Lozano, F. J., & Sammalisto, K. (2019). Teaching sustainability in European higher education institutions: Assessing the connections between competences and pedagogical approaches. *Sustainability*, *11*(6), 1602. https://doi.org/10.3390/su11061602

Lozano, R., Merrill, M., Sammalisto, K., Ceulemans, K., & Lozano, F. (2017). Connecting competencies and pedagogical approaches for sustainable development in higher education: a literature review and framework proprosal.*Sustainability* , *9*(10), 1889.

Nichols, J., & Shorb, T. (2007). Sustainability education and teaching Leadership. *Academic Exchange Quarterly*, *Summer*, 61–65. https://doi.org/10.1111/j.1468-0068.2007.00666.x

Novy, J. W., Banerjee, B., & Matson, P. (2021). A core curriculum for sustainability Leadership. *Sustainability*, *13* (19), 10557. https://doi.org/10.3390/su131910557

Persson, C., Einarson, D., & Melén, M. (2023). Educating the educators to be a driving force in higher education towards sustainable development. *International Journal of Sustainability in Higher Education*, *24*(9), 197–212. https://doi.org/10.1108/IJSHE-10-2022-0332

Petison, W., & Kantabutra, S. (2023). A quest for a sustainable social enterprise model: The case of Amphawa Chaipattananurak, the Kingdom of Thailand. *Sustainability*, *15*(1), 326–340. https://doi.org/10.3390/su15010326

Ramirez, L. (2020). The importance of climate education in a COVID-19 world. *World Economic Forum*. https://www.weforum.org/agenda/2020/05/the-importance-of-climate-education-in-a-covid-19-world/

Rieckmann, M. (2012). Future-oriented higher education: which key competencies should be fostered through university teaching and learning. *Futures*, *44*(2), 127–135.

Ritchie, J. (2013). Sustainability and relationality within early childhood care and education settings in Aotearoa New Zealand. *International Journal of Early Childhood*, *45*(3), 307–326. https://doi.org/10.1007/s13158-013-0079-0

Seatter, C. S., & Ceulemans, K. (2017). Teaching sustainability in higher education: Pedagogical styles that make a difference. *The Canadian Journal of Higher Education*, *47*(2), 47–70. https://doi.org/10.47678/cjhe.v47i2.186284

Sipos, Y., Battisi, B., & Grimm, K. (2008). Achieving transformative sustainability learning: engaging head, hands, and heart. *International Journal of Sustainability in Higher Education*, *9*(1), 68–86.

Stibbe, A. (2009). *The handbook of sustainability literacy: skills for a changing world*. Green Book, Davo.

Suh, H., & Han, S. (2019). Promoting sustainability in University classrooms using a STEM project with mathematical modeling. *Mathematical Modeling Sustainability*, *11*(11), 3080. https://doi.org/10.3390/su11113080

Tabucanon, A. S., Sahavacharin, A., Rathviboon, S., Lhaetee, H., Pakdeesom, D., Xue, W., & Charmondusit, K. (2021). Investigating the critical issues for enhancing sustainability in higher education institutes in Thailand. *International Journal of Sustainable Development Planning*, *16*(3), 503–514. https://doi.org/10.18280/ijsdp.160311

UNECE (United Nations Economic Commission for Europe). (2022). Implementation of the UNECE strategy for ESD across the ECE region (2015-18). https://unece.org/info/Environment-Policy/Education-for-Sustainable-Development/pub/370224

UNESCO (United Nations Educational, Scientific and Cultural Organization). (2020). Education in the time of COVID-19. https://unesdoc.unesco.org/ark:/48223/pf0000374075_eng

UNESCO (United Nations Educational, Scientific and Cultural Organization). (2023). What you need to know about education for sustainable development. https://www.unesco.org/en/education-sustainable-development/need-know

UNIDO (United Nations Industrial Development Organization). (2022). What are green skills?. https://www.unido.org/stories/what-are-green-skills

Wiggins, G., & McThighe, J. (2005). *Understanding by design*. Association for Supervision and Curriculum Development ASCD.