EDUCATION FOR SUSTAINBILITY TO INTERNATIONAL CHINESE COLLEGE STUDENTS OF BUSINESS PROGRAMMES IN THAILAND

By

MENG-TIEN CHIANG

A Dissertation Submitted in Partial Fulfillment of the Requirements
For the Degree of Doctor of Philosophy (Education Management),
China-ASEAN International College
Dhurakij Pundit University
2021

Certificate of Acknowledgement of the Dissertation

China-ASEAN International College, Dhurakij Pundit University

Doctor of Philosophy Program in Education Management

Tile of Dissertation Education for Sustainability to International Chinese College Students of Business Programme in Thailand

Researcher	Meng-Tien CHIANG
Program	Doctor of Philosophy (Education Management)
Principle Supervisor	Assistant Professor Dr. Peng-Fei CHEN
Co-Supervisor	

Has been approved by

刘烨 Chairman of the Committee

(Dr. Ye Liu)

Jian-Hao HUANG Committee Examiner

(Dr. Jian-Hao Huang)

Committee Examiner

(Dr. Man Jiang)

Committee Examiner

(Asst. Prof. Dr. Yuan-Cheng Chang)

Principal Supervisor

(Asst. Prof. Dr. Peng-Fei Chen)

Approved by the DPU China-ASEAN International College

Dean of China-ASEAN International College

(Asst. Prof. Dr. Chun-Shuo Chen)

Date 28 Oct 2022

Dissertation Title: Education for Sustainability to International Chinese College Students of Business Programmes in Thailand

Author: Meng-Tien Chiang

Dissertation Supervisor: Assistant Professor Dr. Peng-Fei Chen

Program: Education Management

Academic Year: 2021

ABSTRACT

Embedding sustainability in business education is an essential transformation in the 21st century for a better future. Sustainability awareness and actions have become crucial for today's business students. Education for sustainable development (ESD) and Principles for Responsible Management Education (PRME) provide the guideline for sustainability curriculum development. The need for developing sustainability curriculum in higher education institutions (HEIs) should move to the experimental stage has been mentioned in the previous research. The aim of this study was therefore to transform the curriculum toward sustainability through integrating ESD and PRME in Thai HEIs' business education programmes with a focus on international Chinese students. A design of quasi-experimental was conducted with 96 students at a private university in Thailand participated in the research. 46 international Chinese college students in the experimental group and the rest 50 in the control group. The intervention of the PRME-based ESD course was applied to the experimental group over a 15-lesson period in 8 weeks. The control group received a regular course without the intervention in the same period of the class schedule. Both the experimental and control groups were taking the questionnaire, the test of

knowledge of sustainability and project performance as the pre-test and post-test. In addition, the method of interview was employed to investigate experimental groups' perspectives after the experimental intervention. The data were statistically analyzed using descriptive statistics, independent sample T-test, paired sample-T test, one-way ANCOVA, Johnson-Neyman procedure and interview. The results showed that the intervention of the PRME-base ESD course was significantly enhanced students' sustainability learning outcomes in the experimental group, especially for those who lack cognitive, socio-emotional and behavioural attitudes toward SDGs. One of the influential factors was the realisation of perceived benefit and self-value in contributing to SD. However, the lack of a comprehensive understanding of self-interest is the reason why the ESD course was not effective for those international Chinese college students with high socio-emotional and behavioral learning outcomes.

Keywords: Principles for responsible management education, Education for sustainable development, sustainable development goals, business education, undergraduate business programme

ACKNOWLEDGEMENTS

It is very grateful to have had the opportunity to undertake this PhD study. My heartfelt gratitude to my supervisor, Assistant Professor Dr. Peng-Fei Chen, whose encouragement, inspiration, and expertise throughout this thesis. It was an honor to study and work under her guidance.

I would like to extend my deepest gratitude to Dr. Ren-Cheng Zhang for his suggestions and constructive criticism to become the improvements of this thesis. Additionally, I am extremely grateful to Dr. Ye Liu, Dr. Man Jiang, Dr. Jian-Hong Ye and Dr. Jian-Hao Huang for providing valuable comments on the thesis.

I would further like to thank to students and lecturers at Dhurakij Pundit University who support me and participated in this study.

Finally, very much appreciate my family. They contribute to this thesis in their own way.

Table of Contents

ABSTRACT i

ACKNOWLEDGEMENTS iii

Table of Contents iv

List of Tables viii

List of Figures xi

CHAPTER 1 INTRODUCTION 1

1.1 Research rationale 1

1.2 Significance of study 8

1.3 Research objectives 9

1.4 Research questions 11

1.5 Research ethics 12

1.6 Structure of chapters 12

CHAPTER 2 LITERATURE REVIEW 14

2.1 Education for Sustainable Development 14

2.2 Principles for Responsible Management Education 36

2.3 Development of the PRME in the business curriculum 52

2.4 Summary 64

CHAPTER 3 METHODOLOGY 66

3.1 Research Framework 67

3.2 Participants 68

3.3 Research procedure 68

3.4 Development of the PRME-based ESD curriculum 69

3.5 Course design of ESD based on the PRME 81

3.6 Experiment 95
3.7 Measurement of pre-test and post-test 96
3.8 Data Collection 107
3.9 Data Analysis 108
3.10 Role of Researcher 109
3.11 Pilot study 109
3.12 Summary 117
CHAPTER 4 RESULTS OF STUDY 118
4.1 Descriptive analysis of the participants 119
4.2 Independent sample t-test of pre-test 120
4.3 Paired-sample t-test 125
4.4 Analysis of covariance (ANCOVA) 131
4.5 Johnson-Neyman procedure 139
4.6 Analysis of interview 145
4.7 Conclusion 155
CHAPTER 5 DISCUSSION 156
5.1 General discussion 156
5.2 ESD learning outcomes in the business programme of higher education 159
5.3 Development of PRME-based ESD curriculum in a higher education business programme 162
5.4 Sustainability learning outcomes of international Chinese college students 164
CHAPTER 6 CONCLUSION 168
6.1 Conclusion 168
6.2 Implications 170

6.3 Limitations of the study....173
6.4 Future research....175
REFERENCES....176
APPENDICES....209
Appendix I: Authors' Curriculum Vitae....210
Appendix II: Informed consent form of research participant....210
Appendix III: Cohen's kappa coefficient of SIP report context unit inference by intercoder....213
Appendix IV: Experts' comments for the curriculum module and mapping of learning outcomes....214
Appendix V: The revision of curriculum modules and learning outcomes....216
Appendix VI: Experts' comments for the course design....234
Appendix VII: The course syllabus and lesson plan of PRME-based ESD....235
Appendix VIII: Outline of post-test interview schedule for experimental group students....240
Appendix IX: Summary of the item analysis results....242
Appendix X: The questionnaire of sustainability learning outcome in the English version....246
Appendix XI: The questionnaire of sustainability learning outcome in the Chinese version....248
Appendix XII: The two-way specification table of the test in the main study....250
Appendix XIII: The test questions in English version in the main study....251
Appendix XIV: The test questions in Chinese version in the main study....259

Appendix XV: Results of Johnson-Neyman procedure of the cognitive learning outcome of the questionnaire 267

Appendix XVI: Results of Johnson-Neyman procedure of the socio-emotional learning outcome of the questionnaire 268

Appendix XVII: Results of Johnson-Neyman procedure of the behavioural learning outcome of the questionnaire 269

Appendix XVIII: Interview transcriptions. 270

List of Tables

Table 2.1 The 17 Sustainable Development Goals (SDGs).....28

Table 2.2 The six principles of PRME.....37

Table 3.1 Inclusion criteria of sample selection 72

Table 3.2 Sample description.....73

Table 3.3 Coding of contents 75

Table 3.4 Background of experts for the valid mapping of the curriculum and learning outcomes 80

Table 3.5 Background of experts for the PRME-based ESD course design.....89

Table 3.6 Result of I-CVI and S-CVI/Ave of experts' validity of course design.....91

Table 3.7 Design of ESD course based on a three-phase model of the PRME principles.....93

Table 3.8 Intervention of the experimental design for experimental and control groups.....95

Table 3.9 Description of the construction of cognitive, socio-emotional and behavioural learning outcomes in the survey.....98

Table 3.10 Two-way specification table for the test on cognitive learning outcomes 102

Table 3.11 Rubrics used to evaluate the students' project performance.....104

Table 3.12 Summary of the test analysis results.....115

Table 4.1 Descriptive analysis of the participants 119

Table 4.2 Descriptive analysis of questionnaire in pre-test 121

Table 4.3 Summary of independent sample t-test of questionnaire in pre-test.....121

Table 4.4 Descriptive analysis of knowledge of sustainability in pre-test 122

Table 4.5 Summary of independent sample t-test of knowledge of sustainability in pre-test.....123

Table 4.6 Descriptive analysis for the test of project performance in pre-test 124

Table 4.7 Summary of independent sample t-test for the test of project performance on pre-test.....124

Table 4.8 Summary of paired-sample t-test of EG for questionnaire 126

Table 4.9 Summary of paired-sample t-test of CG for questionnaire.....127

Table 4.10 Summary of paired-sample t-test of EG for test of knowledge of sustainability 128

Table 4.11 Summary of paired-sample t-test of CG for test of knowledge of sustainability 130

Table 4.12 Summary of paired-sample t-test for project performance.....131

Table 4.13 Summary of testing the homogeneity of the regression coefficient of questionnaire.....133

Table 4.14 Summary of testing the homogeneity of the regression coefficient to test students' knowledge of sustainability.....134

Table 4.15 Summary for testing the homogeneity of the regression coefficient for project performance 134

Table 4.16 Summary of one-way ANCOVA of the test of knowledge of sustainability 135

Table 4.17 Mean of the post-test of the knowledge of sustainability of the EG and CG after excluding the influence of the pre-test on the post-test.....137

Table 4.18 Summary of one-way ANCOVA of the test of project performance 138

Table 4.19 Mean of the post-test of the project performance of the EG and CG after excluding the influence of the pre-test on the post-test 138

Table 4.20 Summary of the result of significant difference of Johnson-Neyman procedure of the cognitive learning outcome of the questionnaire.....140

Table 4.21 Summary of the result of significant difference of Johnson-Neyman procedure of the socio-emotional learning outcome of the questionnaire.....142

Table 4.22 Summary of the result of significant difference of Johnson-Neyman procedure of the behavioural learning outcome of the questionnaire.....144

Table 4.23 Comparison of quantitative and qualitative results to students' sustainability 154

List of Figures

Figure 2.1 Sufficiency economy philosophy and its translation to sustainability 24

Figure 2.2 PRME ecosystem.....39

Figure 2.3 Framework of SDGs in business education.....51

Figure 3.1 Two-phase research framework used in the study 67

Figure 3.2 Process of web-based content analysis.....70

Figure 4.1 Johnson-Neyman plot of the cognitive learning outcomes of the questionnaire.....140

Figure 4.2 Johnson-Neyman plot of the socio-emotional learning outcomes of the questionnaire.....142

Figure 4.3 Johnson-Neyman plot of the behavioural learning outcomes of the questionnaire.....144

CHAPTER 1

INTRODUCTION

1.1 Research rationale

Sustainable development has become the major concern in the past decade due to the dramatic effect of climate change on the environment, which is not only threatening human lifestyles, but human life itself, along with the life of planet earth. Besides, the unequal social, economic and environmental conditions in countries across the world continue to cause a moral dilemma with half the world's population barely able to survive, while the remainder are prospering. More than three decades ago, the United Nations established the Brundtland Commission (1987) with the aim of uniting all countries in the pursuit of social, economic and environmental sustainability as an approach for the future of the planet. This was due to worrying signs of the earth's precious resources being over-exploited. The concept of sustainability was firmly linked to responsibility of this generation to preserve the ecosystem and biodiversity for future generations' benefit (Brundtland Commission, 1987). The notion of sustainability at the business level was proposed by Bowen in 1953 and updated in 2013. Bowen (1953/2013) asserted that businesses owed a fiduciary duty to the society in which they operate because their decisions have a direct impact on employment and economic growth. Since then, corporate social responsibility (CSR) has played an indispensable role in the businesses' success. However, it was also observed that CSR could be exploited by some firms as a.

strategy for their short-term benefit, rather than as a solution for the sustainable long-term development of society and the environment (Doane, 2005).

In fact, CSR cannot change the foundation of a society for which the responsibility belongs to every individual in it. Therefore, the concept of sustainability now rests on individuals and their ability to move forward to a brighter future in the 21st century and beyond. This critical need for sustainability has also driven the development of education to promote the awareness of sustainable development (SD) and education for sustainable development (ESD) has emerged as the root of transformative social change based on cultivating learners who are equipped with the knowledge, skills, values and attitude required to achieve SD (UNESCO, 2021). Therefore, higher education institutions (HEIs) are now playing a pivotal role in driving SD by educating students to understand their responsibilities as global citizens. According to Caniglia et al. (2018), ESD has emerged as a critical component embedded in education systems and its relevance has been widely discussed as a policy to integrate SD in institutions, universities' collaboration and action plans (Aikens et al., 2016; García-Feijoo et al. 2020; Horlings, 2016; Sinakou et al., 2019). Business schools are also increasingly offering ESD to cultivate global citizens and leaders with a sense of SD agency (García-Feijoo et al., 2020).

Some researchers indicated that the prevailing definition of business education was to maximise shareholders' profit and wealth (Blasco, 2012; García-Feijoo et al., 2020; Hernandez-Lopez et al., 2020; Høgdal et al., 2021), which led to it being severely criticised for providing students with a narrow view of a profit-driven perspective. This narrow perspective in business became the origin of contemporary

issues such as financial crises and amoral management (Giacalone & Wargo, 2009), indicating the realisation that business should not focus on maximising profit (García-Feijoo et al., 2020) but instead, emphasise responsible management to achieve long-term sustainability. García-Feijoo et al. (2020) affirm that business schools especially play a key role in changing society through transformation management and business conduct. In 2006, the UN Global Compact established the Principles for Responsible Management Education (PRME) initiative for transforming business and management education (PRME, 2021a) with the aim of advocating responsible decision-making and an SD mindset in education (PRME, 2020b). PRME has become a practical theory of conducting ESD in academic institutions with a basic structure of six principles: "purpose, values, method, research, partnership, and dialogue" (PRME, 2020b, p. 2). The six PRME principles provide management education guidelines for a socially responsible and sustainable corporation (Cicmil et al., 2017). In 2020, over 850 signatories and partners were committed to the PRME initiative (PRME, 2021b).

In addition, the United Nations established a 2030 agenda for SD with 17 goals (SDGs) to transform our world (United Nations, 2015) by bringing a systemic change from the macro-level of policy to the micro-level of the individual. The 2030 agenda contains a vision for political institutions to overcome challenges by achieving SDGs (Breuer et al., 2019), which have become the new rationale for policymaking (Geels et al., 2019). Many countries are making efforts to integrate SDGs into their regional policies to localise the 2030 agenda and influence their local systems (UNDESA, 2018). The awareness of SD in industry is awoken by the guidance of the government's SDG policies. Value creation in industry 4.0 is orientated toward sustainability and the need of new production processes and business models (Junior et

al., 2019). This significant change is also apparent in organisational management with SDGs being included in corporate annual reports and key performance indicators (KPIs) (Hartley, 2022). The transition to sustainable-orientated industry has an inevitable impact on the job market and increases the demand for education. According to the International Labour Organisation (ILO) (2018), a policy of sustainable practices could create about 24 million new jobs in the economy by 2030; on the other hand, the trend of SD will eliminate 6 million jobs. However, the gap of skills and training for the transition to environmental sustainability is greater than before (ILO, 2019), which raised concern about HEIs' ability to educate students and equip them with sustainability skills for the future job market. Therefore, SDGs were perceived to be explicit objectives for HEIs to navigate a pathway to ESD and the PRME initiative through the lens of SD.

Despite the growing awareness of SD in HEIs, there are still gaps in the development of the curriculum (Bartlett et al., 2020; Tandon, 2017). There is a need to move the development of SD to the experimental stage of the plan to integrate it into the university curriculum (Lozano et al., 2017). Previous researchers, who have discussed the efficiency of integrating SD in a single course and across various courses, have indicated that it is hard to influence students' perspective of SD in a single course (Leal Filho et al., 2019; Mintz & Tal, 2016). Learning about SD in university is a process that needs a personal learning experience. Therefore, universities should consider building a holistic programme to cultivate students' cognitive and behavioural perspectives of SD. For example, some universities have re-defined their vision and curriculum framework to align with the concept of SD (Greenberg et al., 2017; Wersun, 2017). SD is a complex concept which requires a cross-disciplinary dialogue for the

transformation (Dlouhá et al., 2017). Chen et al. (2018) investigated the topic of SD in business sustainability courses in colleges from the perspective of industrial experts and found that, in their opinion, the topic of SD essentially needs a cross-disciplinary collaboration of various management courses rather than being embedded in a single course. Nevertheless, a single course is still generally offered, despite the need of a comprehensive plan to develop an SD curriculum for business programmes (de Assumpção & Neto, 2020).

This lack of a comprehensive plan for a sustainability design for business courses and programmes means that learning outcomes cannot be assessed (Bartlett et al., 2020). Therefore, it is imperative that HEIs focus on how to effectively deliver the concept of sustainability to their students, which includes investigating the sustainable development objectives that must be integrated into the curriculum (Lozano et al., 2017). SDGs can be a blueprint for these objectives (García-Feijoo et al., 2020); for instance, for mapping the mainstream SDGs and themes in different courses (Dmochowski et al., 2016; Nhamo, 2020). However, the incorporation of SDGs in universities is still in the initial stage (Agbedahin, 2019; Leal Filho et al., 2019), although the emphasis on SDGs brings more opportunities for developing sustainability and responsible management, which are the same objectives as ESD and PRME. According to Weybrecht (2017), achieving SDGs is the core of promoting sustainability and responsible management.

It is clear that the content of sustainability in business studies is in the early formative stage with the need of a well-established foundation. In this context, universities should focus on curricular reform to provide a management curriculum with sustainability embedded that is connected to stakeholders (Henderson et al., 2019;

Mintz & Tal, 2016). ESD and PRME are the main components to integrate sustainability into the development of a curriculum for business programmes. ESD is the root for delivering sustainability based on the six principle-framework of PRME to engage with business education. Both components emphasise the importance of embedding SDGs into the design of the content, learning outcomes and teaching activities of universities. Therefore, the holistic development of sustainability in a business programme curriculum is investigated in this research by integrating ESD and PRME and the effectiveness of content design is further examined by discussing students' learning outcomes of SDGs for sustainability.

The motivation for conducting this research is based on the researcher's experience of teaching a course on sustainability management to international Chinese college students in a business programme in Thailand and finding that the students' perspective of the purpose of business was still profit-driven after they had completed the course. Moosmayer et al. (2019) undertook similar research and found that, despite business educators' aim to promote social values, graduates' mindset was still profit-driven and they exhibited a lack of responsible management.

Despite the mandate to embed the concept of sustainability into primary and secondary education through ESD in China (Leicht & Byun, 2018), Chinese students' recognition of ESD still needs improvement according to previous researchers. For instance, Yuan and Wu (2021) examined Chinese high school students' understanding of SDGs in relation to their learning experience and daily life, and found their awareness was limited. Meanwhile, Wang and Maresova (2020) found that students' practice of sustainable activities in daily life was low.

Only 23 of the 1,272 higher education institutions in China that offered an undergraduate programme in 2020 were involved in the PRME (Ministry of Education, 2020; PRME, 2020d). This finding indicates a severe lack of attention to ESD in higher education in China, particularly with respect to integrating sustainable development into the undergraduate programme of higher education institutions. The concept of sustainability has been embedded into primary and secondary education through ESD in China (Leicht et al., 2018). Despite the mandate of embedding ESD in the educational system, the awareness of SDGs of Chinese students still presented a need for improvement. Previous study examined the Chinese high school students' understanding of the SDGs regarding their learning experience and personal life; results showed a limited awareness of SDGs (Yuan & Wu, 2021). Wang et al. (2020) mentioned that students poorly engage in sustainable activities in their daily lives. How to foster students' actions of implementing SDG knowledge is the main issue requiring consideration (Chen, 2020; Savelyeva & Douglas, 2017). In response to this issue, this research draws attention to the growing number of undergraduate international Chinese students in Thailand (ICEF, 2019). Undergraduate study forms the main group of international students in Thailand in the last ten years (Jampaklay et al., 2022). In addition, Chinese students comprise most of the international student population in Thailand, which reached the proportion of 40% (Jampaklay et al., 2022). These international Chinese students learn from the receiving country and bring impacts to the economy and society.

In Thailand, sustainable development is based on the Sufficient Economy Philosophy (SEP) proposed by King Bhumibol Adulyadej on the 4th December 1997 as a guideline, in which education and knowledge are observed to be essential components

of the foundation for promoting SD (Rukspollmuang, 2017). Despite the SEP, only three universities have joined the PRME institution (Faculty of business administration, Chiang Mai University; Sasin school of management, Chulalongkorn University; and Business school, Thammasat University) (PRME, 2020c). In addition, Thailand's economic, social, and environmental sustainability is unbalanced (Rukspollmuang, 2017); therefore, college students' notion of sustainability is crucial. The participants in this research are international Chinese college students enrolled in a business programme in Thailand, who are expected to provide empirical research to examine the validity of the curriculum development.

1.2 Significance of study

The purpose of this research is to address the crucial concerns that have been expressed in relation to the curriculum development and learning outcomes of sustainability in business programmes. The significance of the research lies in its theoretical and practical contributions to existing research in this field.

1.2.1 Theoretical significance

The first main theoretical contribution is to fill the gap in existing research caused by the lack of agreement of the vital sustainability competencies to include in the programme (Eizaguirre et al., 2019). SDGs can be objectives to guide the actions of students in business schools in combination with professional content and this will increase their awareness of SD (García-Feijoo et al., 2020). Therefore, one theoretical contribution of this research involves investigating the ESD learning outcomes in business programmers and connecting them with SDGs to establish a business education pathway for sustainability.

Secondly, PRME has become the framework for integrating sustainability into business education based on six principles and these six PRME principles were redefined in this research as a guiding reference for the implementation of a framework for redeveloping the business education curriculum.

1.2.2 Practical significance

In terms of practical contributions, firstly, this research provides an example of a business programme curriculum for HEIs that want to transform business education in order to achieve sustainability. Secondly, instructors find it challenging to design teaching content to promote sustainability (Landrum & Ohsowski, 2017). Therefore, the ESD curriculum built in this research is based on PRME to provide ideas for content design and sustainability assessment tools for instructors to fill this gap. Thirdly, students' knowledge and skills of sustainability will be cultivated based on this curriculum design and this will significantly increase their employability. This is because industries are employing more industrial experts than ever before to consider the sustainability mindset and skills of their employees (Laasch & Conaway, 2014) and business sustainability practices are essential skills for today's business graduates from these experts' perspective (Chen et al., 2018).

1.3 Research objectives

Universities now play the role of local anchor to promote SD (European Commission, 2011) and there is a broad consensus that sustainability needs to be integrated into higher education due to rapid socio-economic and environmental changes. ESD and PRME are the main components of transformative education based on the impetus of SD. The criticism of business education is rising due to the narrow

perspective of profit driven as a definition of business and the changed social needs. Hence, it is generally acknowledged that business education needs to be transformed by embedding sustainability in the curriculum, but there is still a lack of implementation. On the one hand, this is claimed to be due to background and local circumstances of each university, which has caused the need for empirical studies to find a pathway in different regions where there are no similar institutions (Corcoran et al., 2004). On the other hand, the nature of ESD is cross-disciplinary, and there is no standard content design.

Therefore, the aim of this research is to investigate the current status of education for sustainability in Thai HEIs' business programmes from the perspective of international Chinese college students in Thailand. The objectives of the research are a) to identify the primary learning outcomes of ESD and PRME currently implemented in business programmes; b) to design an ESD curriculum based on the PRME for international Chinese college students in Thailand; and c) to measure international Chinese college students' outcomes of sustainability after the intervention of the ESD curriculum based on the PRME, as detailed below.

A) To explore the learning outcomes of ESD in the business programme of higher education institutes.

B) To build an ESD curriculum based on the PRME for the delivery of business programmes to international Chinese college students.

C) To examine the effect of the ESD course on the implications of developing international Chinese college students' outcomes of sustainability.

D) To determine if international Chinese college students' learning outcomes of sustainability are enhanced by the ESD intervention compared to those in the regular college business course.

1.4 Research questions

The aims of this research are to develop and build a holistic curriculum of sustainability for application to college business programmes by integrating ESD and the PRME and to examine the effectiveness of content design by discussing international Chinese college students' learning outcomes of sustainability at a private university in Bangkok, Thailand. ESD and the PRME are used to investigate the delivery of sustainability in business programmes because, on the one hand, ESD is the root to promote sustainability thinking and action in HEIs and on the other, the PRME emphasises the transfer of SD to business education. Hence, the research questions are as follows;

A) What are learning outcomes of ESD in a business programme of higher education?

B) What is a PRME-based ESD curriculum for business programmes for international Chinese college students?

C) How does an ESD course intervention develop international Chinese college students' sustainability learning outcomes?

D) Are the sustainability learning outcomes of the international Chinese college students in the ESD intervention better than those of the students in the regular college business course?

1.5 Research ethics

The ethical guidelines for research on human subjects in Thailand were applied to this research (NRCT, 2015). The researcher will explain the purpose of the research to all the participants, who are 20–21-year-old students, before the experiment takes place. The participants have the full right to decide whether or not to join this research and, in terms of informed consent, they will be provided with an information sheet via an online survey due to the COVID-19 pandemic. An application for the approval of the experimental trial will subsequently be sent to the institutional review boards (IRBs) and ethics committees (ECs) in Dhurakij Pundit University. This research follows the process of human research ethics of Dhurakij Pundit University in applying for the approval of the experiment and data collection. The overall research will be conducted anonymously.

1.6 Structure of chapters

The framework of the research chapters is presented below.

Chapter 2 concerns the development of ESD and its impact on higher education, and the emergence of the PRME in business education to further develop an understanding of combining ESD and the PRME using SDGs.

Chapter 3 contains an outline of the methodology of this research design, which involves developing an ESD curriculum based on the PRME, includes the findings of ESD learning outcomes, design content and the experimental process employed in the intervention of the experimental group. Further, devoted to a discussion of data collection, data analysis and pilot study. A pilot study of the measurement tools, including the analysis of the pilot data and a survey and test.

Chapter 4 is presented the results of the experimental research with a description of the interventions for the experimental and control groups' survey, test, and rubric.

Chapter 5 focused on the discussion of the results from this study. The discussion is related to the ESD curriculum and students' learning outcomes of sustainability to connect with previous research.

Chapter 6 consists of an assessment of the findings of the study and the research questions. The research is also concluded in this chapter with some reflections of the current research and recommendations for future research in this field.

CHAPTER 2

LITERATURE REVIEW

The purpose of this chapter is to explore two key aspects of the background to this research: 1) the significance of ESD and SDGs in higher education, and 2) the development of PRME and SDGs, including the influence of business education and the effect of the curriculum.

2.1 Education for Sustainable Development

Education for sustainable development (ESD) can be defined as 21st century education due to the essential concern about sustainability in this century (Bell, 2016), when it has become a crucial social, economic and environmental goal. The importance of cultivating students with the mindset and competencies to achieve sustainable development has been integrated into higher education institutions (HEIs) through ESD, with the aim of producing responsible global citizens who can identify SD issues and apply multidisciplinary thinking to develop solutions that promote sustainability (Buckler & Creech, 2014; Hensley, 2020; Howlett et al., 2016). The United Nations Educational, Scientific and Cultural Organisation (UNESCO) report on Issues and Trends in Education for Sustainable Development (Leicht et al., 2018) defines ESD as follows;

> Education for Sustainable Development (ESD) aims to develop competencies that enable and empower individuals to reflect on their own actions by taking into account their current and future social, cultural, economic and environmental impacts from both a local and a global perspective. It requires individuals to act in complex situations in a sustainable manner to explore new ideas and approaches and participate in socio-political processes, with the objective of moving their societies progressively towards sustainable development (p. 39).

ESD is a policy-driven subject which relies on a top-down approach. The concept of SD was initially introduced in the 1987 Brundtland report, entitled *Our Common Future* (Evans, 2010), in which it was declared that, in view of the global challenges of environmental threats and poverty, development must be sustainable "to ensure that it meets the needs of the present generation without compromising the ability of future generations to meet their own" (Brundtland Commission, 1987, p. 16). Moreover, failure to manage environmental and developmental issues also implied the need of a new perspective of the interrelationship of the environment, economy and society. It was stated by the Brundtland Commission (1987) that the new approach to solving these challenges is based on recognising that environmental threats are interwoven with social and economic development. This perspective is similar to that of Barbier (1987), who proposed that the three circles of social, economic and biological system goals should be considered and promoted together to achieve sustainability.

Barbier (1987) proposed a central concept of SD that the consensus of economic development requires an innovative change in ownership of organisations and governments to solve the issue of poverty and improve the quality of life of people in developing countries. Environmental conservation, economic development and social activities cannot be separated because sustainability requires an equitable society and economy and a tolerable utilisation of environmental resources, the so-called three circles of SD, to make it viable. These three circles of SD may be the starting point of the concept of three pillars and the triple bottom line applied to 21st-century business (Purvis et al., 2019). Meanwhile, McDonough and Braungart (2002) introduced the cradle-to-cradle framework to emphasise that nothing in nature is wasted. Therefore, all natural resources should be reduced, reused and recycled. Hence, the way products have been designed or produced since the industrial revolution needs to change to make resources into closed-loop cycles. Three circles of SD and cradle-to-cradle framework have become the critical notions in ESD to mention changing the way we act by building a new perspective of the relationship among environmental conservation, economic development and social activities.

2.1.1 Development of ESD

ESD was established at the 1992 United Nations Conference on Environment and Development in Rio de Janeiro to address the issue of sustainable development. It was introduced in Agenda 21 as having three purposes: "reorientating education toward sustainable development, increasing public awareness, and promoting training" (United Nations, 1992, p. 320). These three purposes as a process started with education to foster the acquisition of the capacity for sustainable development to affect decision-making and increase awareness in all countries and provide job-specific

training for environmental development (United Nations, 1992). The plan of implementation of Agenda 21 was presented in 2002 at the World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa, indicating the actions to be taken in order to protect the environment and drive socio-economic development.

The integration of ESD in the teaching and learning of HEIs began to be more explicitly scientific when the United Nations established the Decade of Education for Sustainable Development (DESD) between 2005 and 2014. The progress of ESD can be divided into four phases, the first of which was the DESD, which included the establishment of a roadmap "to integrate values, activities, and principles of ESD in the education and learning" (UNESCO, 2007, p. 5). Studies of sustainability in higher education from 2001 to 2010 tended to address universities' environmental management (Wu & Shen, 2016), while the more recent focus has been on the operation of formal and informal curricula (Wals, 2014). The second phase began with the announcement of 17 sustainable development goals (SDGs) and 169 targets to navigate actions in *Transforming Our World: the 2030 Agenda for Sustainable Development in 2015* (UNESCO, 2019). The primary actions were focused on "1) advancing policy; 2) transforming learning and training environments; 3) developing the capacity of educators and trainers; 4) mobilising youth; and 5) accelerating sustainable solutions at local levels' (UNESCO, 2019, p. 18). A holistic foundation of these processes was developed in this phase in order to drive ESD. The third phase involved the establishment of a global action programme (GAP) from 2015 to 2019 to reaffirm the primary actions of ESD and address the pivotal role of partnership with the community; for example, building partnership networks with the community to commit to the ESD

actions and construct platforms for sharing ideas (UNESCO, 2014). In the fourth phase, the so-called post-GAP, the implementation framework of *Education for Sustainable Development: Towards achieving the SDGs (ESD for 2030)* was established to strongly advocate the achievement of the 17 SDGs and continued contribution to the objectives of the GAP. The role of policy-makers, institutional leaders, learners, parents, educators, youth and communities in participating in the ESD to achieve the 17 SDGs was emphasised in the framework (UNESCO, 2019), which also illustrated the essence of establishing a systematic initiative from top-down to integrate ESD in HEIs.

ESD moved to another action decade with the SDG framework in 2020, in which UNESCO defined the goal of ESD for 2030 as cultivating learners to become agents of sustainable development by increasing their awareness and transforming their perception of the need to act to achieve the SDGs (UNESCO, 2020a). Therefore, SDGs can be seen as the core of the holistic development of ESD. UNESCO (2020a) affirms that the learning content of ESD should integrate SDGs and inter-connect them in order to establish a transformational approach. One study of the learning content of ESD involved examining the policy and curricula of pre-primary to upper secondary schools in five regions, which included ten countries committed to ESD. The results revealed that all ten countries were clearly committed to a pathway of three learning dimensions (cognitive, socio-emotional, and behavioural) according to their various contexts, systems and needs. It has been indicated by an investigation of the curriculum's learning content that the focus on the three learning dimensions is on different levels. The focus on cognition is more significant than on socio-emotional and behavioural dimensions, which are influenced by local circumstances and subject domains (UNESCO, 2020b).

Past researchers have emphasised the significance of policy for the global and national implementation of ESD because it is a policy-driven subject that is constructed by a top-down approach. Therefore, global and national policy-making influences the inclusion of ESD in academic institutions in practice (Poeck et al., 2018). Nevertheless, since the top-down approach lacks a local response, it has a negative impact on the effective implementation of ESD, which makes it essential to consider the local context when designing the curriculum and the course, including the culture, lived experience and social location, since they affect the learning outcomes (Aikens et al., 2016; Dlouhá et al., 2017; Iyengar & Bajaj, 2011). A review of the literature reveals that the integration of sustainability in HEIs primarily represents a trend of applying a top-down approach based on policy and administrative or cultural changes to transform the campus into a green campus or the university into a sustainable HEI (Mazon et al., 2020). Notwithstanding, it is evident from studies of institutions' transformation to sustainability that implementing a top-down approach causes the university to become detached from campus users (Mazon et al., 2020; Wu & Shen, 2016). Mazon et al. (2020) investigated the sustainable integration approaches implemented in HEIs and applied a dichotomy to divide them into top-down and down-up approaches. They found that the daily practice of campus users is the key to promoting sustainability in a university; hence, a bottom-up approach is necessary to shift daily campus users from recipients to active agents of sustainability. Accordingly, the development of sustainable initiatives should start from students' perspective and they should be given the opportunity to play a role in it, which can effectively reinforce their awareness and perception and enable them to understand their personal value.

2.1.2 ESD in higher education

The embedding of ESD in the HEI framework, including operations, education, research and outreach, has had a huge impact on the role of HEIs. The concept of sustainability is increasingly dividing universities' work into the four dimensions of governance and operations, education, research, and public engagement (Zhou et al., 2020), which is generally referred to as community outreach (Fissi et al., 2021; Sterling, 2013). Beynaghi et al. (2016) proposed that the notion of ESD is the development of sustainable well-being, which has become the fundamental mission of a university, which influences its structure based on actions outside the campus, transdisciplinary research and the production and sharing of cross-sector knowledge. New kinds of universities are emerging, which are orientated toward society, the environment and the economy. Social orientation is focused on the transformation of society and human development for sustainability by promoting learners as change agents and engaging with local issues. Environmental orientation is directed toward the natural sciences and the transformation of the engineering field for environmental sustainability by learning from experience. Economic orientation involves the development of social innovation and natural science for sustainability by cultivating learners' entrepreneurialism and driving economic evolution. Integrating ESD into a university produces different orientations, which is not only due to the university's resources and strengths, but also local and regional challenges.

Universities now play a role in promoting the sustainable transformation of a locally-based or social subsystem into one that is incorporated with the government, industry and civil society. They are essentially in response to the changing demand for local economic, social and environmental sustainability, which also demonstrates that

the collaboration between universities and the community is a pivotal action for regional sustainable development (Mazon et al., 2020). According to the European Commission (2011), universities are anchors for the development of regional sustainability, which is beneficial for both the universities and the region in terms of the development of innovation, growth of enterprises and businesses, and social equality. For example, by building a knowledge transfer partnership (KTP) between the university and the region, the departments of the university can interact with local businesses to optimise human capital based on a specialisation strategy. Hence, embedding ESD in higher education reinforces the importance of actions taken outside the campus and the collaboration between academia, industry and the local community.

However, despite the changes and opportunities for universities to embed sustainability into their operation, it is still challenging for them. Weybrecht (2017) argues that schools should consider how to play an active role in SDGs, rather than just embedding sustainability, and proposes a four-step framework to examine the existing status and generate an advantage by changing the challenge of sustainability in schools to an opportunity. The aspects considered in the four-step framework are 1) setting the scene; 2) integrating (embed, collaborate, contribute); 3) unique engagement points; and 4) enabling environment. Firstly, in setting the scene, the school should analyse the current status of the initiatives by estimating their impact on the campus, curriculum, research and stakeholders. Weybrecht (2017) divides the school's engagement in sustainability into five spectrums based on an examination of the current initiatives. This also shows that engagement in sustainability has become a trend to evaluate the governance and operation of a school. In fact, according to Nhamo and Mjimba (2020), "the addressing of SDGs may be an unwritten licence to operate" (p. 4).

Secondly, integration starts with embedding sustainability to increase the impact of the school. Weybrecht (2017) addresses the engagement of sustainability in the student lifecycle, which she regards as being more relevant to students' specialities and careers than increasing their awareness. The student lifecycle begins with the process of communication and recruitment by the university. Campus activities and curriculum design should cross different subjects or fields to cultivate their soft skills and capacity for development. Moreover, building a community provides students with experience by learning from the real world in order to practice sustainability in industry. The careers services of universities should recognise that sustainability is also a speciality that can be part of students' career. Meanwhile, alumni are a pivotal resource because they may become future business partners of the school. In terms of collaboration, the need to cross boundaries and collaborate with governments and NGOs, rather than business stakeholders, is emphasised to contribute innovative implementation, both locally and globally. Thirdly, there is no model of unique engagement points to practice sustainability due to the different positions of schools. Each school must determine its own unique opportunities by considering issues of interest, the contribution of experts, and the possible impact on the school. Fourthly, for an enabling environment, schools need to empower and incentivise faculties to play an active role in sustainability. Following the developmental progress of ESD in HEIs, four dimensions of universities (governance and operations, education, research, and public engagement) facilitate a move to the fifth (Amaral et al., 2015; Fissi et al., 2021). These are the ways of SDGs' implementation in higher education.

2.1.3 ESD in the Thailand context

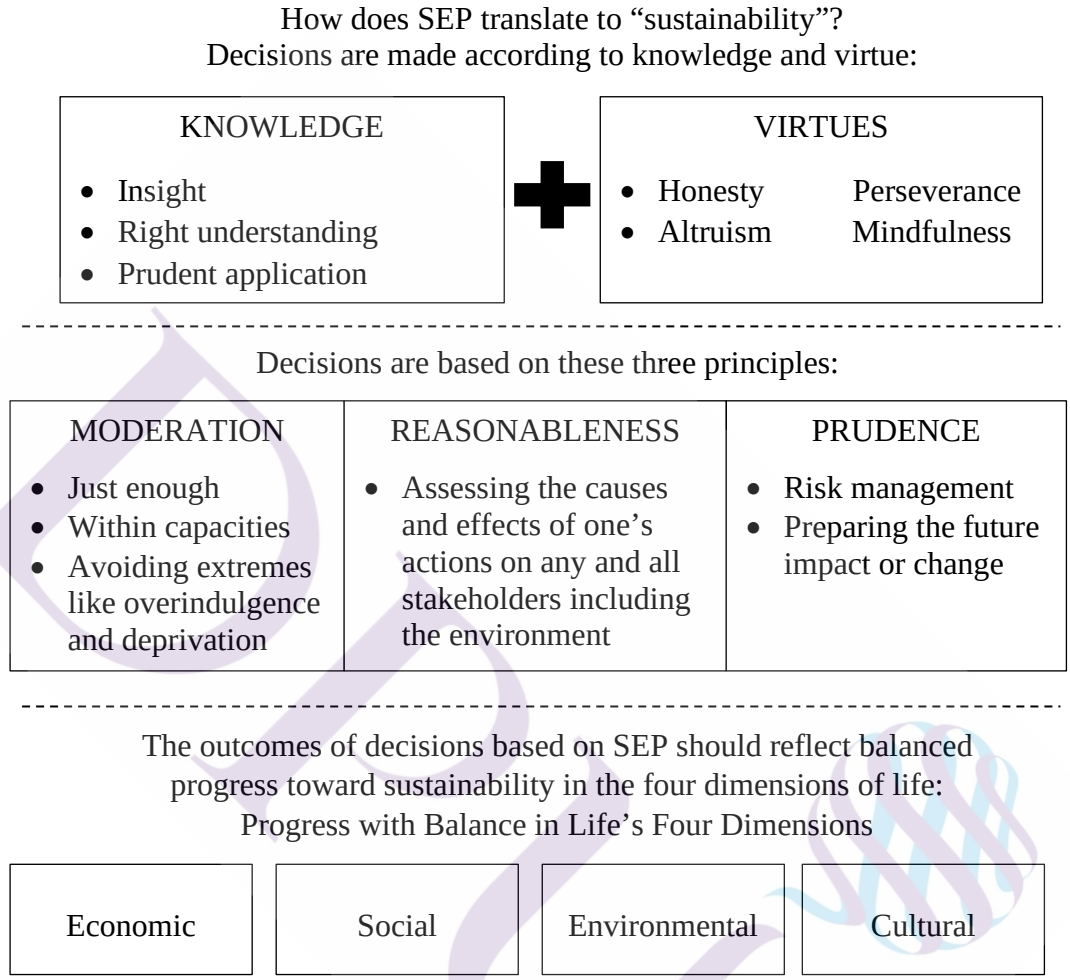
In Thailand, the concept of SD is driven by the Sufficient Economy Philosophy (SEP), which King Bhumibol Adulyadej proposed on 4 December 1997 (Rukspollmuang, 2017). The concept of SEP is briefly defined as follows:

> "Sufficiency economy" is a philosophy that stresses the middle path as the overriding principle for appropriate conduct by the populace at all levels. This applies to conduct at the level of the individual, families, and communities, as well as to the choice of a balanced development strategy for the nation so as to modernize in line with the forces of globalization while shielding against inevitable shocks and excesses that arise. "Sufficiency" means moderation and due consideration in all modes of conduct, as well as the need for sufficient protection from internal and external shocks. To achieve this, the application of knowledge with prudence is essential. […] (Mongsawad, 2012, pp. 127–128).

The framework of sustainability progress has been established according to SEP, which aims to balance the economic, environmental, social and cultural dimensions in Thailand (see Figure 2.1).

Figure 2.1

Sufficiency economy philosophy and its translation to sustainability



Note. This figure demonstrates the elements of the SEP framework and applies to sustainability development in Thailand. Adopted from: Rukspollmuang, C. (2017). Sustainability policy and practices in Thai higher education. In M. Y. Merrill, P. Burkhardt-Holm, C. H. Chang, M. S. Islam, & Y. Chang, (Eds.), *Education and Sustainability: Paradigms, Policies and Practices in Asia* (pp. 145-162). Routledge. Copyright 2017 by Routledge.

The main principles necessary for attaining the aim are moderation, reasonableness, and prudence. Moderation advocates people to live their lives to meet their basic needs and without extremes. Reasonableness is promoting self-awareness in realising the effect of personal actions on the world. Prudence is building the ability of risk management and self-immunity to face future challenges. All principles are underpinned by knowledge and virtues. Knowledge is applying the insight of understanding to make prudent decisions. Virtues refer to the mindset of ethical behaviour, which include honesty, perseverance, altruism and mindfulness (Ministry of Foreign Affairs, 2017; Rukspollmuang, 2017). The framework of sustainability presents that the SEP state is in line with the United Nations' concept of sustainable development. Both of them mentioned that education and knowledge are a pivotal foundation for promoting SD.

In Thailand, SEP has become the framework in transitioning education towards SD. In 2001, the Ministry of Education announced that the national basic curriculum needs to cultivate students with SEP thinking to impute SD awareness (Dharmapiya & Saratun, 2016). ESD was widely introduced into Thai education since 2006 because the concept aligns with the tenth national economic and development plan (2007–2011) and the SEP strategy in the national education plan (2002–2016) (Nuamcharoen & Dhirathiti, 2018). In the national education plan, the curriculum has been highlighted as the main point that needs reform (Nuamcharoen & Dhirathiti, 2018). Many schools have developed sufficiency-based programmes in Thai education at all levels. According to Dharmapiya and Saratun (2016), there was about 46 per cent of Thai schools had been certified as sufficiency-based in 2015.

The localisation of ESD is through the implementation of SEP in Thailand, which can also be seen from the sufficiency-based curriculum. For example, Chulalongkorn University developed the SD strategies through the SEP framework and the SDGs in the undergraduate programmes (Chulalongkorn University, 2020–2021). The university integrated SD in the general education courses and required all undergraduate students to take at least 30 credit hours (Rukspollmuang, 2017). ESD has become one objective in the general education curriculum in Chulalongkorn University, which presented that SD knowledge and skills are the basic foundation for personal development. According to Chulalongkorn University (2020–2021), the aims of the general education centre of Chulalongkorn University are to foster personal development. This finding is in line with Nuamcharoen and Dhirathiti (2018), who stated that ESD should be integrated into the basic education curriculum in Thai education. Moreover, the Ministry of Foreign Affairs initiated the programme of SEP for SDG youth partnership which has been not only implemented in Thailand but also a cooperation with Cambodia, Lao People's Democratic Republic, Vietnam and Indonesia. The purpose of this programme is to promote SEP thinking and SD with the cooperative countries via SDG projects. Students need to design a project for solving wicked problems and achieving SDGs. Although the implementation of SEP has presented the actions towards ESD in Thailand, the projects had presented an unbalanced situation which focuses on environmental issues instead of social and economic issues (Rukspollmuang, 2017).

In 2016, Thailand announced a new economic policy, Thailand 4.0, with the aim of developing a prosperous, secure and sustainable country (The Economist, 2017). Sustainability focuses on reaching an SD of economy and society without

destroying the environment (Buasuwan, 2018; Wittayasin, 2017). In line with Thailand 4.0, many of the HEIs are starting to enhance the SD plan for education and research in Thailand (Tabucanon et al., 2021). According to the Ministry of Education Thailand (2017), education needs reform before entering Thailand 4.0, which is not only delivered knowledge but rather cultivates the people to be global citizens with morality, analytical skills and inclusivity in the 21st century. However, research still scarcely pays attention to the practices of ESD (Suriyankietkaew & Hallinger, 2018). Many schools abandon ESD practices after the short-term implementation (Nuamcharoen and Dhirathiti, 2018). Tabucanon et al. (2021) affirmed that Thai HEIs lack practical experiences to deliver sustainability concepts for students. The curriculum should be renewed to reach the objective of Thai education in the 21st century (Pimdee & Jedaman, 2017). The curriculum such as marketing and management is in the business field and should be redesigned to meet the SD needs of Thailand HEIs (Isa et al., 2020). Although the development of sustainability has become a national strategy in Thailand, ESD persists in not being a compulsory movement for Thailand HEIs (Nuamcharoen and Dhirathiti, 2018). Implementing ESD should build a long-term plan from the reform of curriculum to reach the goal of Thai education in the 21st century.

2.1.4 Implementation of sustainable development goals in the curriculum

Sustainable development goals (SDGs) are part of a new universal agenda that corresponds with the aim of ESD and emphasises the importance of eradicating poverty. SDGs are one of the Millennium Development Goals (MDGs), which were adopted in 2000 and expired in 2015 (World Health Organisation, 2018). Their focus is on poverty and health (Leal Filho et al., 2019) and the progress toward eradicating either of these using MDGs has been sluggish in undeveloped and developing countries

due to being off-track with health issues (United Nations, 2015). Therefore, SDGs were launched with action indicators to provide a precise scale, including 17 goals (see Table 2.1) and 169 connected targets, representing a new objective to balance economic, social, and environmental development (United Nations, 2015).

Table 2.1

The 17 Sustainable Development Goals (SDGs)

Goal	Result
1. No poverty	End poverty in all its forms everywhere.
2. Zero hunger	End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
3. Good health and well-being	Ensure healthy lives and promote well-being for all at all ages.
4. Quality education	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
5. Gender equality	Achieve gender equality and empower all women and girls.
6. Clean water and sanitation	Ensure availability and sustainable management of water and sanitation for all.
7. Affordable and clean energy	Ensure access to affordable, reliable, sustainable and modern energy for all.
8. Decent work and economic growth	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
9. Industry, innova-teion and infrastru-cture	Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation.
10. Reduced inequa-lityes	Reduce inequality within and among countries.

Goal	Result
11. Sustainable cities and communities	Make cities and human settlements inclusive, safe, resilient and sustainable.
12. Responsible consumption and production	Ensure sustainable consumption and production patterns.
13. Climate action	Take urgent action to combat climate change and its impacts.
14. Life below water	Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
15. Life on land	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land de-gradation and halt biodiversity loss.
16. Peace, Justice and strong institueons	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
17. Partnerships for the goals	Strengthen the means of implementation and revitalise the global partnership for sustainable development.

Note. This table presents the details of 17 SDGs with definitions. Adapted from https://sdgs.un.org/goals. Copyright 2021 by United Nations.

The United Nations Statistical Commission established a global indicator framework in 2017 to track the progress of SDGs in the world by increasing the monitoring of SDGs via global reporting. The United States, China and member states of the Organisation for Economic Cooperation and Development (OECD) are closer to achieving the goals of SDG 2, 3, 4, 6, and 9 than other regions and some emerging

economies and developing regions have not been able to achieve any SDG goals (Global Sustainable Development Report, 2019). Although the global indicator framework is beneficial for tracking progress, monitoring the progress of SDGs by a number of participating countries based on global reporting is still challenging. An analysis of the indicator data of global reporting reveals that gender equality (SDG 5) is an issue of concern in countries or areas that do not make regular reports (United Nations, 2020). Meanwhile, the goals that are making sluggish progress in every country are "goals relating to inequality, responsible consumption and production (SDG 12), and nature (SDG 13, 14, 15)" (GSDR, 2019, p. 12). Notably, SDG 4 is focused on the quality of education, which can be seen as the starting point to accelerate the progress of sustainable development by educating learners to be responsible global citizens. SDG 4 represents the significance of equipping learners with knowledge and soft skills for human existence and social development (Ketlhoilwe & Velempini, 2020). Target 4.7 of SDG 4 reads as follows;

> By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development. (United Nations Statistics Division, 2020, p.1).

New societal requests assist universities to find small niche innovation (Korhonen-Kurki et al., 2020). Many universities apply SDGs as indicators of their activities to

demonstrate their social responsibility and serve the public good (Nhamo & Mjimba, 2020). The implementation of SDGs serves to increase the impact and strengthen the competitive advantage of universities. Engagement with SDGs is beneficial in terms of evolving the curriculum and the university's position (Hong, 2020; Leal Filho et al., 2019). However, it is hard for the practice of SDGs by activities in a single course to be effective. According to Leal Filho et al. (2019), the successful implementation of SDGs must produce a holistic system based on operational and management strategies to allocate resources and build the engagement of all the faculties. In line with the research, a study has been made of the development of a curriculum framework with SDGs based on the concept of "from project to structure" (Schreiber & Siege, 2016, p. 16). This concept presents the approach of deploying resources to establish a long-term framework from the basis of short-term activities.

Stephens and Graham (2010) claim that, although the transformative approach for sustainable development has been emphasised for universities, radical change raises the issue of faculty engagement, which reduces the potential in practice. The temporal integration of transition management is the most pragmatic approach based on a combination of short-term activities and long-term planning. There are four levels of transition management: 'reflexive', 'operational', 'tactical' and 'strategic' (Loorbach, 2007). The reflexive level involves the assessment of current activities at various levels, while the operational level involves the production of learning and knowledge by project implementation. The tactical level involves negotiation with faculties and stakeholders to build a sub-system and a long-term framework is established at the strategic level with goals and objectives based on social development. There is no fixed model for the integration of SDGs due to the different backgrounds

of universities. Universities should remain flexible in order to achieve SDGs by meeting local needs by implementing short-term activities to develop a long-term framework (Loorbach, 2007).

The implementation models and SDGs of participating universities have a different focus, which highlights the localisation of SDGs. Leal Filho et al. (2019) examined the way in which SDG themes were addressed in the teaching of 167 universities worldwide and found that the universities in North America pay more attention to SDG 3 whereas South American universities focus on SDG 4. In Africa, the teaching addresses SDGs 4, 6, and 11, which is different from the universities in Asia with their emphasis on SDGs 3 and 4. In Oceania, the teaching of SDGs is focused on SDGs 2 and 6 and in Europe, on SDG 13. Studies of the localisation of SDGs emphasise the reform of the curriculum in universities in order for students to develop knowledge, values, attitudes and skills from the perspective of transformative learning to increase the link with contemporary issues, especially relevant local issues (Aikens et al., 2016; Dlouhá et al., 2017; Iyengar & Bajaj, 2011; Zhou et al., 2020).

Caniglia et al. (2018) proposed the concept of a glocal curriculum based on learning sustainable problems and solutions by understanding global and local geographical and cultural contexts. There are three glocal curriculum dimensions to educate students to be transformation agents, namely, knowing, acting and being. Knowing means that students should learn how to produce inter-and transdisciplinary knowledge, while acting is focused on the development of global and local collaboration and being refers to empowering students to commit to cultural and geographical social responsibility. Meanwhile, the curriculum should include areas of subject learning and research learning for students to generate actionable knowledge of

sustainable issues by participating in reflection and activities to develop effective sustainability competencies. The glocal curriculum concept is in accordance with the framework of an ESD curriculum in Germany, which divides competencies into recognising, assessing and acting (Schreiber & Siege, 2016), to both address the delivery of essential interdisciplinary knowledge and the ability to practice responsible action.

The curriculum is the weakest dimension in the university according to the Association for Advancement of Sustainability in Higher Education (AASHE) (Bartlett et al., 2020). The design of sustainability does not have a comprehensive plan for courses and programmes and also lacks an assessment of learning objectives (Bartlett et al., 2020). Tandon (2017) affirms the need to revise the curriculum and introduce new courses to embed SDGs in higher education to catalyse learning. In terms of the curriculum revision, the existing syllabus and curriculum should be revised to integrate the SDGs' perspective. This is in the same line of studies that have been presented to consider the adjustment of mapping mainstream SDGs and themes in different courses (Dmochowski et al., 2016; Nhamo, 2020). Furthermore, introducing new courses to correspond to SDGs is not covered in the current curriculum.

The nature of the concept of sustainable development is dynamic which needs cross-curricular collaboration to address the different scales and contexts of challenges (Caniglia et al., 2018; Hensley, 2020; Sinakou et al., 2019). Dlouhá et al. (2017) maintain that the most challenging issue involved in teaching sustainable development is the barrier of a disciplinary-based approach without interdisciplinary or multidisciplinary dialogue and the link with institutional policies or operations. The crossing of disciplinary boundaries has become a fundamental idea for revising the

curriculum and the use of interdisciplinary and transdisciplinary approaches in different fields of the curriculum for the integration of sustainable development. One of the challenges to implementing the revised curriculum using the interdisciplinary approach is how lecturers can accomplish the demands of the assigned integrative course, hence, faculties should not only address the learning objectives and formats of the curriculum, but also the courses' interlinkage of a common focus and teaching units (Ruesch Schweizer et al., 2019).

Dmochowski et al. (2016) presented a process model to develop a new or revised curriculum to solve the issues of a weak connection to sustainability in the existing curriculum and descriptions in the course and syllabi. The main concept of this model is "teacher-learners *together with* learner-teachers" (Dmochowski et al., 2016, p. 652). The process begins with a workshop to engage various speciality faculty members to discuss the SDGs themes together and outside experts are invited to give at least one presentation and converse with the faculty members. A faculty workshop has become a crucial factor in improving the engagement of SDGs. Studies of the faculty's teaching of SDGs have revealed that integrating SDG themes in the course is the primary barrier to implementation and that a professional faculty workshop, learning community, and eco-literacy workshops for non-faculty staff are effective ways to improve implementation (Bartlett et al., 2020; Hong, 2020; Korhonen-Kurki et al., 2020; Leal Filho et al., 2019).

A critical factor of this successful model is student research assistants who need to work with two different speciality faculty members to innovate the existing courses to ensure an interdisciplinary production. Student research assistant needs to present their course development work after the eight-week programme in a poster

session to share and educate faculty members about the new or revised curriculum. The emphasis on students' involvement benefits the evolution of courses and programmes (Korhonen-Kurki et al., 2020; Stephens & Graham, 2010). The research of Briggs et al. (2019) on the sustainability voice representatives (SVRs) project is a student-led co-curricular project. Students who are SVRs are trained by sustainability project officers who organise students' feedback of their academic experience and integrate it into the programme. The dialogue between SVRs and sustainability project staff takes place in a 'School Staff Champions' meeting' to revise the plan and develop a new initiative of SDGs. SVRs bring value to the curriculum review and design by investigating students' awareness and learning experience of sustainability after they have undergone the curriculum. However, the challenges of using SVRs to promote SDGs are firstly, how to make students aware of the link between sustainability and their curriculum to arouse their interest, and secondly, how to rebuild the network of interested students when the main SVRs have resigned the role.

Some researchers state that introducing new courses or add-on courses to integrate sustainability in the curriculum (Lozano, 2010; Tandon, 2017); however, this approach is still controversial. Sidiropoulos (2018) recommends incorporating the development of sustainability in the curriculum to enable students to connect with it via every learning experience in the programme. Introducing new courses can be outreach activities to promote SDGs to the public; for example, promoting open education to contribute to SDG 4 and lifelong learning through equitable quality education (Lane, 2017). However, the curriculum still needs to evolve to embed SDGs in every course.

Although many universities involve SDG actions, a holistic change in the curriculum such as the vision of the programme needs a different path for every

university due to their uniqueness. The incorporation of SDGs in universities is still in the initial stage (Agbedahin, 2019; Leal Filho et al., 2019) and the COVID-19 pandemic has had an unexpected impact of dramatically disrupting progress, especially in terms of poverty, healthcare and education (SDG 1, 3, 4), which causes a dilemma due to the off-track of progress of SDGs (DESA, 2020). Therefore, it is imperative for universities to accelerate the change in education for these SDGS to be achieved.

2.2 Principles for Responsible Management Education

Principles for responsible management education (PRME) is a United Nations-supported initiative that was launched in 2007 with the vision of advocating responsible decision-making and a sustainable development mindset in education (PRME, 2020a). To transform management education and navigate the actions of sustainable development via a principle-based network to not only engage academic institutions globally, but to accelerate the systematic integration of a responsible strategic focus (Beddewela, et al., 2017; Storey et al., 2017), the PRME established six principles to encourage educational institutions to embed sustainable development action in their programmes (de Paula Arruda Filho, 2017; PRME, 2020a). The six principles of higher education institutions are shown in Table 2.2. According to the PRME (2020b). Principle 1 represents the core idea of the PRME to navigate the direction for participants; Principle 2 value highlights the significance of curricula as a guide to show the integration of the PRME in the organisation (Killian et al., 2019); Principle 3 stresses the method by which the activities are engaged with the learning experience and sharing research and experience to promote the PRME (de Paula Arruda Filho, 2017); Principle 4 points to the importance of social transition by investigating

business activities. Lastly, principles 5 and 6 partnership and dialogue, indicate a need to build partnerships to awaken the realisation of the benefits of PRME in industry and the community and deliver the activities in the programme in practice (Carruthers et al., 2017; Parkes et al., 2017).

Table 2.2

The six principles of PRME

Principles	Define
1. Purpose	We will develop the capabilities of students to be future generators of sustainable value for business and society at large and to work for an inclusive and sustainable global economy.
2. Values	We will incorporate into our academic activities, curricula, and organisational practices the values of global social responsibility as portrayed in international initiatives such as the United Nations Global Compact.
3. Method	We will create educational frameworks, materials, processes and environments that enable effective learning experiences for responsible leadership.
4. Research	We will engage in conceptual and empirical research that advances our understanding about the role, dynamics, and impact of corporations in the creation of sustainable social, environmental and economic value.
5. Partnership	We will interact with managers of business corporations to extend our knowledge of their challenges in meeting social and environmental responsibilities and to explore jointly effective approaches to meeting these challenges.
6. Dialogue	We will facilitate and support dialog and debate among educators, students, business, government, consumers, media, civil society organisations and other interested groups and stakeholders on critical issues related to global social responsibility and sustainability.

Note. This table presents the details of PRME with definitions. Adapted from https://www.unprme.org/what-we-do. Copyright 2020 by PRME.

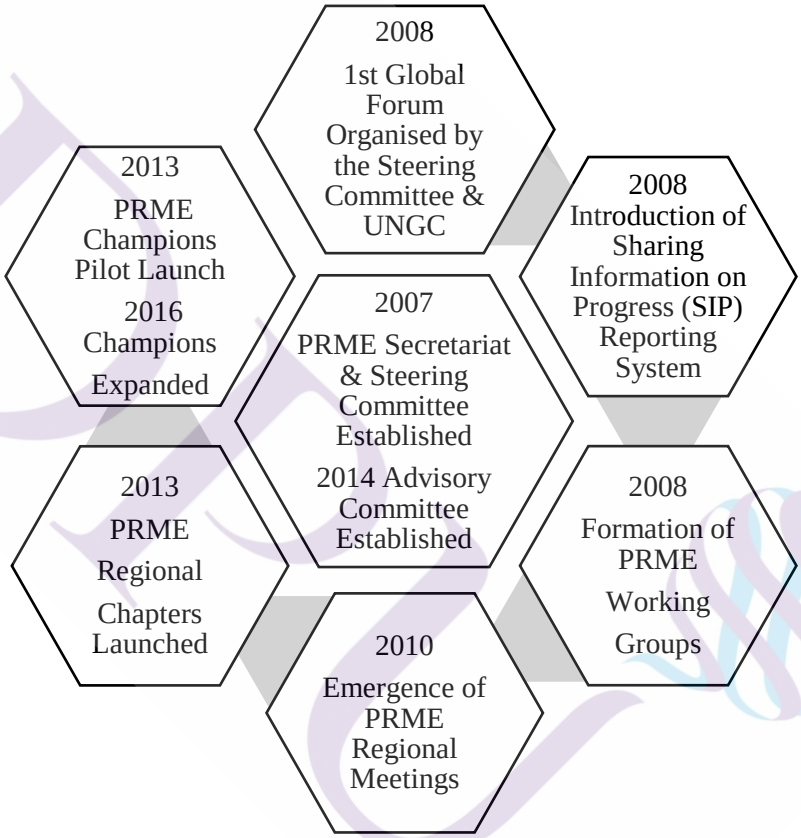
The network has been developed from the level of individual institutions to regions in order to reinforce the incorporation of the PRME through a reporting system, working groups, regional meetings, chapters, and PRME champions (see Figure 2.2). The signatories need to present the results of the implementation of six principles in a report sharing information on progress (SIP) and submit it in the reporting system. In line with ESD, the PRME advocate the significance of the knowledge and understanding of sustainability issues and SDGs in business for students (Parkes, 2017). More than 850 signatories were committee to the PRME initiative in 2020 (PRME, 2021b).

The core concepts of the PRME are sustainability, responsibility and ethics. For sustainability, management should consider applying the concept of a triple bottom line to develop an implementation plan for the organisation to create value for the business and simultaneously contribute to society and the environment. Responsibility refers to the management's goal to improve stakeholders' value (SV) rather than focusing on the shareholders' benefits (Laasch & Conaway, 2014). Stakeholders are defined as all individuals and groups related to the company, such as employees, customers and the government (Laasch & Conaway, 2014). Ethical management should be based on moral decisions and operational processes. The morality of people's actions when faced with the question of what is right or wrong involves making an ethical decision based on considering personal factors and the effect on other stakeholders (Laasch & Conaway, 2014). The component of ethics conveys the value of decision-making to students and teaches them to be reflective and criticise the decisions made to seek more possibilities of the action plan (Gottardello & Pàmies, 2019). Responsible management should include sustainability, responsibility, and ethics as a basic

foundation and these concepts should be promoted by managers throughout the operational process. The dimensions of sustainability, responsibility and ethics are also the criteria to examine the management's performance and if it reaches a superior standard, it can be called prime management (Laasch & Conaway, 2014).

Figure 2.2

PRME ecosystem



Note. The PRME ecosystem represents the development of the PRME network from evolving pathways to align UNGC more effectively and PRME in pursuit of sustainable development goals in H. O'Keefe and W.M. O'Keefe, 2017 (p. 15), Routledge. Adopted from: O'Keefe, H., & O'Keefe, W. M. (2017). Evolving pathways to align UNGC more effectively and PRME in pursuit of the sustainable development goals in Flynn, P. M., Tan, T. K., & Gudić, M. (Eds.), *Redefining success: Integrating sustainability into management education* (pp. 13-28). Routledge. Copyright 2017 by Routledge.

Notably, responsible leadership is the core of increasing the opportunities and overcoming the barriers of developing the PRME in an organisation (Escudero, et al., 2015; Greenberg, et al., 2017; Wersun, 2017), which is also mentioned in the principal 3 ‘method’. Responsible leadership can overcome the barriers of building a holistic product that aligns with the university and stated programme structure. Wersun (2017) affirms that, although the RME initially established six principles, universities should avoid “Bolt-on it”. They must try to “re-imagine” their future business based on the PRME to define their vision of the first step of institutionalisation, which essentially involves responsible leadership and management to overcome the barriers in each step toward practicing it. For example, the Glasgow School for Business and Society (GSBS) established a PRME leadership team to design strategies for integrating the PRME in the university, to ensure that the PRME was mainstream in the organisation for the long term. Once the leadership has committed to sustainability values, the strategies for partnerships and affiliations can be ensured by sharing those values (Escudero et al., 2015). However, some businesses or faculty members do not fully realise the value of adopting the PRME (Arruda Filho et al., 2019; Carruthers et al., 2017). Sharing these values can assist the building of mutually-beneficial strategies with stakeholders, businesses and faculty members, as well as simultaneously increasing their awareness of the PRME. Sharing the values so that faculty members can become interested in the PRME and link it with the curriculum can assist them to earnestly recognise the need to embed the PRME in the business world (Carruthers et al., 2017; Solitander et al., 2012).

2.2.1 Implementation of the PRME framework in business education

The implementation of six principles of PRME in university mentioned cultivating student to be a leader and global citizen via delivery of the notions of ethics, responsibility and sustainability (ERS) in the first principle of purpose. Newcastle Business School (2020) set the objective of shaping students to become future leaders who can be responsible for their decisions on themselves and society in the principle of purpose. The strategy to reach the objective is to integrate ERS content into the curriculum and collaborate with stakeholders to provide more engagement opportunities. ERS brings new knowledge and perspective to business schools, which stress not only individual decision-making as a future leader (Copenhagen Business School, 2019; Nottingham University Business School, 2019) but also ethical behaviour as a global citizen. Students should recognize the personal impact and value of ethical behaviour to the society, economy and environment (University of Dubai, 2015-2016; Sobey School of Business, 2018-2020). Business schools present the core idea of increasing the awareness, engagement and research opportunities of ERS and cultivate students to be leaders and global citizens to contribute to society in the principle of purpose.

Secondly, the principle of value highlights the need to educate students' multiple points of views on responsible decision and SDG content. The curriculum should allow students to utilise cross-disciplinary thinking so that they can make responsible decisions, thereby enabling them to be aware of the importance of social responsibility and SDG issues (Deakin University, 2017-2018; Newcastle Business School, 2020). SDG curriculum mapping is an approach to the extent of the content

across various courses (La Trobe Business School, 2018-2020). The content of social responsibility and SDGs has been emphasised in the principle of value.

Thirdly, the principle of method emphasises considering the society, economy and environmental impacts of SD and responsible management on different regions and organisations. A region's context is introduced to the students to help them understand the challenges in different regions and organisations. Nottingham Business School (2019) established the 'Global Responsibility Week' and cooperated with international partners to develop students' understanding of different organisations' challenges. La Trobe Business School (2018–2020) highlighted the sustainability issues in the Asia-Pacific region to give students an insight into the sustainability challenge related to social, economic and environmental factors and build their international view. In addition, local community and organisation development is a key theme to involve students in sustainability issues based on their life experiences (George Mason University School of Business, 2013-2014; Glasgow Caledonian University, 2018; Sobey School of Business, 2018-2020). Regarding responsible leadership, entrepreneurship has been stressed to develop more possibilities for SD (Newcastle Business School, 2020; Nottingham University Business School, 2019). Newcastle Business School (2020) recommended the application of responsible leadership to create more entrepreneurialism for teaching the impacts of sustainability on various managing strategies in an organisation.

Fourthly, the principle of research involves connecting society and business issues with SDGs to create sustainable values. Universities extend their research themes to link with SDGs based on their mission or the primary goal (Deakin University, 2017–

2018; Glasgow Caledonian University, 2018; La Trobe Business School, 2018–2020; Newcastle Business School, 2020; Nottingham Business School, 2019). For example, Deakin University (2017–2018) established the research themes of 'social inclusion, PRME initiative, corporate governance and environmental marketing' (p. 27) in accordance with its research centres' statement of global social responsibility to connect with SDGs. Each research theme focuses on different SDGs to create value through research projects. Glasgow Caledonian University (2018) consisted with its current mission to promote a statement of 'For the Common Good' to set society research topics such as public health and life quality to collaborate with SDGs to contribute to the society.

Fifthly, the principle of partnership emphasises connecting with stakeholders to develop the idea of sustainability and responsible management strategies in real-world issues. Universities have held special events and conferences to assist students in exploring real-world issues (Copenhagen Business School, 2019; Newcastle Business School, 2020; University of Dubai, 2015–2016). For example, Copenhagen Business School (2019) held an investment seminar, which included the factors of the social and environmental situation and the impact of the ethical behaviour of stakeholders on investment processes. In addition, guests have been invited to share business experiences with students in a particular class (Newcastle Business School, 2020). The partnership with academics, industry and community was generally implemented on providing the learning objective of solving real-world issues to build the awareness of sustainability and responsible management (Deakin University, 2017–2018; George Mason University School of Business, 2013-2014; La Trobe Business School, 2018–2020; Newcastle Business School, 2020; Nottingham University

Business School, 2019). The problem/project and consultation approach is applied to allow students to practice ERS and SDG notions with a real-world issue. Nottingham Business School (2019) used students consultancy projects to collaborate with industry partners for the greenhouse gas management issue and develop students' ability to plan for sustainability and benefit the business organisation strategically. The consultancy project was conducted with the leadership and employability module, which gives an implementation approach to combine ERS and SDG 13 (climate action).

Sixthly, the principle of dialogue focuses on promoting ERS and SDGs to individuals or organisations. An online platform is one approach to present ideas, research results and content that can raise the awareness of ERS and SDGs. Copenhagen Business School (2019) utilised social media platforms to engage students in SDGs and responsible management and share resources with the public. Deakin University (2017–2018) established the PRME website to present the SDG content to engage students and academics. The activities of setting new research themes, conference and working group on a specific topic have also been applied to promote global awareness, responsible leadership and sustainability change agents (Deakin University, 2017–2018; Glasgow Caledonian University, 2018; La Trobe Business School, 2018–2020; Newcastle Business School, 2020; Nottingham Business School, 2019). Students' competition has presented the effectiveness of engaging students in research on SDGs (Deakin University, 2017–2018).

In 2015, the PRME advocated the importance of businesses achieving SDGs, which is in line with ESD (Haertle, et al., 2017; Parkes, 2017) and became the largest sustainability-focused business school network (PRME, 2016). The PRME has been seen as an initiative for the reform of business education (Forray & Leigh, 2012).

Every signatory presents a different strategy to implement the six principles based on their local circumstances. The implementation of the PRME gives universities an opportunity to enhance their influence on business by acquiring accreditation of the association to advance collegiate schools of business (AASCB) (Warin & Beddewela, 2016) and sharing research on corporate responsibility and sustainability (Carruthers, et al., 2017).

2.2.2 Linking SDGs with the PRME framework in business education

Business education has been criticised for its narrow view of the profit-driven definition of business (Blasco, 2012; García-Feijoo et al., 2020; Hernandez-Lopez et al., 2020; Høgdal et al., 2021). The failure to foster responsibility and a sustainability mindset in business causes the attitude and actions of graduates to become profit-driven (Hernandez-Lopez et al., 2020), which brings amoral management and a financial crisis into industry (Giacalone & Wargo, 2009). Therefore, universities have begun to include the PRME in business education due to the importance of responsible management and sustainable development in environmental, social and corporate governance in the business context (Killian et al., 2019). The framework of the PRME consists of six principles to transform business education, which form an extensive network to commit to these principles. However, the implementation of the PRME has been confronted by many challenges since 2007 due to local circumstances, and embedding SDGs in the PRME has been identified as the next step to extend the field for participants to enrich their development opportunities (Storey et al., 2017). For instance, in 2017, the Global Forum mentioned that the next step for the PRME involves the deep integration of SDGs in curricula (Haertle et al., 2017). Hence, aligning SDGs

and the PRME has become the major issue for participants who are devoted to transforming business education.

Wersun (2017) asserts that the PRME framework plays the role of a global policy to develop ESD in higher education. In addition, the PRME and ESD are more connected than before due to their common objective of SDGs. de Paula Arruda Filho (2017) proposed a three-phase model to correlate the PRME and SDGs in the curricula. The first phase involves the adoption of principles 1 and 2 to focus on building knowledge of sustainability development, while the second phase is based on principles 3 and 4 to embed SDGs from the experiential learning and research. The third phase entails the adoption of principles 5 and 6 to practice the application of sustainability development by interacting with industry to facilitate dialogue and debate with different stakeholders. This model uses the six PRIME principles to introduce SDGs as teaching content and activities in order to transform the curriculum, which accords with previous studies in which the PRME framework is defined as a global policy or initiative to directly apply SDGs in higher education (Cicmil et al., 2017; Wersun, 2017).

One of the challenges for business schools is to maintain the drive to transform the curriculum by connecting the PRME and SDGs, thereby increasing students' engagement in the SDGs teaching content and activities (Storey et al., 2017). Hays et al. (2020) explored the case of an IMT business School in Dubai that used the sustainable process paradigm (SSP) to implement the PRME and SDGs. In this case, various projects were established to link the PRME and SDGs, such as a project called empirical research on sustainable business models based on connecting principle 4 to SDG 11. The main components of SSP active learning, partnership (SDG 17), and a project-based approach and its core concept is to apply action learning for students to

build sustainable life experience based on collaboration with social networks. Moreover, the importance of utilising SDGs 11 and 17 in collaborating with industry is stressed in order to design co-curricular or extra-curricular activities for real life experience.

In contrast, some universities create a framework based on their own characteristics consistent with their history and culture. For example, Badson College re-defined its mission and announced a new committee on "Themes for Educating the Next Generation of Entrepreneurial Leaders" after the university joined the PRME network. In terms of the PRME and this committee, the university proposed the SEERS (Social, Economic, and Environmental Responsibility and Sustainability) framework to connect with SDGs and be integrated into the curriculum. The SEERS framework consists of four themes, each of which is connected to different primary and supporting SDGs to give an explicit direction to faculty members. For instance, SDGs 8, 9, 11 and 12 are linked to an operation, management and entrepreneurship course to highlight responsible production and sustainable business models (Greenberg et al., 2017). Similarly, the rising network also appears to promote the PRME and SDGs by its own vision, such as the academy of business in society (ABIS). The ABIS was launched at the INSEAD business school with the emphasis on sharing research to build a sustainable future, which is its strength in contributing to SDGs 8, 9, 11, and 12 (Storey et al., 2017).

Another way to commit to the PRME and SDGs is to establish a transdisciplinary programme. Brazilian business management and public administration schools have established an immersive study and research programme (ISRP), which aims "to foster citizenship, encourage more collaborative attitudes, and expand its participants' vision of the world by taking them to places where life was quite

different from what they had experienced" (Wood & Pansarella, 2019, p. 2). The teaching and learning content of the ISRP is based on social problems selected by applied research centres in the school and the participants work in groups to find solutions to social problems. The participants include undergraduate students who are enrolled in the management field and have passed the selection process and postgraduate students. The post-graduate and Master's students play the role of supervisors to lead the undergraduate students in the group. Every group has differently-themed cases linked to SDGs (Wood & Pansarella, 2019). Notably, partnership (SDG 17) is linked with all the themed cases, which is vital for underpinning the holistic development of the PRME and SDGs.

SDGs illustrate the various dimensions of sustainability that need commitment for a better future. Business schools play a key role in delivering quality education (SDG 4), which affect the achievement of all SDGs, especially direct results in terms of decent work and economic growth (SDG 8), industry, innovation and infrastructure (SDG 9), sustainable cities and communities (SDG 11), responsible consumption and production (SDG 12), and partnerships to achieve the goals (SDG 17) (Kolb et al., 2017). SDG 17 is the catalyst to accelerate the impetus of the PRME and SDGs due to collaboration, which is the foundation for achieving other SDGs. Many researchers highlight SDG 17 as being the basis of all SDGs (Hays et al., 2020; Korhonen-Kurki et al., 2020; Wood & Pansarella, 2019) due to the cross-disciplinary nature of SDGs. The study participants need to apply cross-disciplines and think critically to find the approach to achieving SDGs, and SDG 17 can stimulate cross-disciplinary collaboration to create innovative solutions. For instance, SDG 17 of industry-academic collaboration increases the awareness of sustainability in industry

and produces solutions based on the university's research. Killian et al. (2019) presented an interdisciplinary module to engage undergraduate students to promote the awareness and knowledge of sustainability in a business school by including SDG 17 in the curriculum to provide experiential learning based on industry-academic collaboration. The results showed the benefit of enhancing the awareness of social sustainability in both organisations and business schools. SDG 17 plays a role in launching holistic transformation by building a linkage with all other SDGs.

SDGs 8 and 12 are the primary considerations in the business community (Dowd, 2016), which should be addressed together to overcome the barriers to sustainable development (UNESCO, 2019). Notwithstanding, there seems to be less focus on SDG 8 than other SDGs (Oxborrow & Lund-Thomsen, 2017). Meanwhile, productivity growth is sluggish due to the impact of the COVID-19 pandemic, which affects SDGs 8 and 12 (UNEP, 2020; United Nations, 2020). SDG 12 has emerged as an increasingly dominant dimension that must be tackled to enable global recovery in the post-COVID-19 era (UNEP, 2020). The detrimental effect of COVID-19 on the world's economic system has reinforced the awareness of the need to build sustainable economies in the post-COVID-19 era (Guterres, 2020). The detriment of the economic system has affected the achievement of SDG 9 (United Nations, 2020) and some business schools have embedded the context of the international organisation for standardisation (ISO) in the teaching content or management structure of the institution (Cicmil et al., 2017; Zeng & Stratton, 2017). For example, the ISO 14001: 2015 standards have been embedded into the UWE in Bristol (Cicmil et al., 2017) in an attempt to address SDGs 8, 12, and 9 because these standards are linked to these particular SDGs. However, the progress of SDG 9 has received less attention from

researchers than other SDGs in Asia (Salvia et al., 2019), which implies the urgency to address SDG 9 to enhance awareness and strengthen its linage with other SDGs.

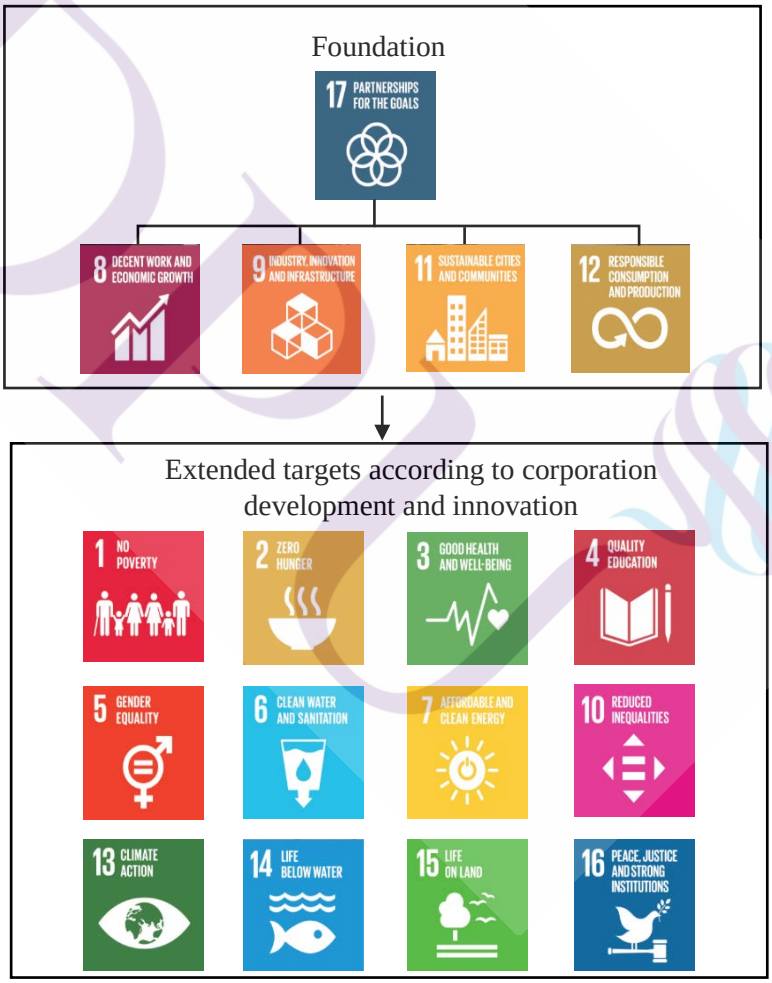
Salvia et al. (2019) indicates that SDG 11 is one of the research trends in Asia that is emphasised by experts; however, achieving SDG11 is deemed to be more challenging than achieving other SDGs. The approach to achieving SDG 11 requires a new direction in Asia and the Pacific, such as the issue of reducing the slum population (Nicolai et al., 2016). UNESCO (2019) affirms that SDGs 11 and 9 need to be addressed at the same time in order to achieve sustainability by 2030. Researchers have also proclaimed that SDGs 8, 9, 11, 12 have the same sustainability dimensions; hence, they should be addressed together to accomplish the same objective of the efficient use of resources (Muff et al., 2017). Previous researchers have shown that an innovative approach is needed to achieve SDG 11 and this can start with universities' involvement. As part of the local community, universities live in the same circumstances and have the same lived experience, which gives them an advantage to understand local problems. Collaboration between universities and communities can give impetus to innovative solutions by engaging the different perspectives of researchers, faculty members and students.

In summary, SDGs 8, 9, 11, 12, and 17 are considered to be the foundation of the integration of the PRME into business education in universities due to the significance of sustainable development. In addition, other SDGs are regarded as extended objectives based on various developments or corporate innovation. A framework of SDGs in business education is proposed in Figure 2.3. Establishing the value with a few SDGs is more effective for developing the curriculum than addressing all the SDGs (17 SDGs with 169 targets), primarily for deeply developing students'

knowledge and skill and avoiding decoupling (Kolb et al., 2017; Ndubuka & Rey-Marmonier, 2019). The integration of SDGs can specifically focus on a small group of SDGs, which can be developed as a foundation for the new curriculum, research, and partnerships (Wersun et al., 2020). Accordingly, this study will focus on linking SDGs 8, 9, 11, 12, and 17 with the PRME in business education.

Figure 2.3

Framework of SDGs in business education



Note. This framework of SDGs in business education is proposed by the author. The communication materials of the SDGs logo are adopted from https://www.un.org/sustainabledevelopment/news/communications-material/. Copyright 2021 by United Nations.

2.3 Development of the PRME in the business curriculum

The application of the PRME framework to integrate SDGs was perceived to be imperative for schools and teachers to design and develop a formal curriculum for business education. (Portelli, 1993). However, this new formal curriculum lacked sufficient educational interaction because some of its content was beyond that of the original curriculum (Blasco, 2012). Høgdal et al. (2021) examined the delivery of the responsible management content in the formal curriculum of a PRME champion school using student focus groups to collect the necessary feedback. They found that some of the students used buzzwords to describe the concept of social responsibility and did not feel that it was part of the course. These results showed that the formal curriculum had not changed the students' norms and values and they felt that the concept of responsible management was not related to their major. Previous researchers have affirmed that it is hard to change students' norms or values of social responsibility merely by using the formal curriculum; instead, attention needs to be paid to a hidden curriculum (Blasco, 2012; Borges et al., 2017; Høgdal et al., 2021).

A hidden curriculum has been regarded as an implicit element of curriculum development (Blasco, 2012), referred to by Vallance (1974) as "non-academic, but educationally significant, consequences of schooling that occur systematically, but are not made explicit at any level of the public rationales for education" (p. 7). For instance, students discuss their personal interests and social problems with lecturers or peers in an informal way (Winter & Cotton, 2012). The successful development of the PRME curriculum depends on considering the content of a hidden curriculum (Blasco, 2012), which can grow by communication with stakeholders to recognise "what really matters" (Sambell & McDowell, 1998, p. 392). Borglund et al. (2019) propose that stakeholders

of industry are external facilitators of the development of a PRME curriculum based on providing schools with comments in relation to teaching content to advise them of the sustainable knowledge with which graduates should be equipped. They observed a case in which a Master's curriculum in sustainable business was designed and developed by a Swedish business school in collaboration with industrial representatives in a quarterly meeting consisting of experts from different organisations. The main topic of discussion in this meeting was industries' requirement of graduates with particular knowledge of sustainability so that the curriculum content could be designed in collaboration with these groups. The researchers also divided external facilitators into four roles. The first are visitors to the company who give a short lecture in class, such as guest lecturers. The second are planners involved in the curriculum design by commenting on content. The third are co-operators who interact with students on case days to create knowledge. The fourth are co-educators, who provide internships and act as mentors in the students' projects.

It is crucial to develop the PRME curriculum in collaboration with external partners, such as industry and the PRME network, to achieve the aim of creating content that is in line with current trends and social needs. It will also avoid lecturers being faced with the question of what content should be included in teaching sustainability due to the lack of an official standard (Landrum & Ohsowski, 2017). According to Landrum and Ohsowski (2017), "the field of sustainable business studies is still in an early formative stage" (p. 401); therefore, researchers have focused on investigating the design and development of teaching content with industrial experts. For instance, Chen et al. (2018) collaborated with 14 industrial experts to obtain their opinion of the content that should be included in business sustainability courses in colleges and found a total

of five groups of topics. The first is “resource usage reduction and management”, which comprises environmental issues, such as carbon emission footprints. The second, which concerns “corporate governance and labour safety”. is constructed of economic factors and daily operations, such as financial statements and quality management. The topic of ISO is also included in this group, which corresponds with the observation of Cicmil et al. (2017). The third group consists of “business sustainability practices”, which are also connected to the economy, but more practical aspects, such as a green supply chain, communication skills and data analyses. The fourth group, which involves “employee morality formation and community involvement” in relation to social topics, is focused on increasing the awareness of sustainability of employees and the local community. The fifth group, “knowing the law and regulations”, refers to the foundation of laws and regulations related to sustainability, such as intellectual property rights and human resource management.

The above-mentioned research demonstrates that sustainability is linked to various courses in business education from the industry perspective, but it needs to be integrated into the entire curriculum in the programme rather than being embedded in a single course. However, it is still common for curricula to be redesigned by structuring a single course with sustainability embedded in it. de Assumpção and Neto (2020) analysed 29 sharing information process (SIP) reports from 18 business schools in the PRME champions group in order to determine the path of their practice of the six PRME principles. In terms of the curriculum, they found that, despite the general application of a multidisciplinary approach to embed sustainability in management courses, there is also a high frequency of sustainability being embedded in the design of single courses.

2.3.1 Design of a PRME curriculum in business schools

Hope (2017) proposed a framework of a PRME curriculum tree with roots, trunk, branches and leaves to guide the design of a business school curriculum, in which responsible management and sustainability were embedded from the first to the final year. The roots refer to the role of business in contemporary society, which is linked to PRME principle 2, 'values'; therefore, they should be embedded in the first year of introductory courses to build society's belief in the role of business as the foundation of business education. In this context, the course is designed with a focus on enabling students to understand the relationship between business and stakeholders by criticising the functions of business. The trunk refers to a business operation based on responsible management, which is connected to PRME principles 5 'partnership' and 6 'dialogue'. The trunk emphasises the core concept and theory of business management, which should be embedded in the second year of the course to enable students to recognise the business functions that constitute responsible management. The discussion section mentioned in the learning process is essential for students to debate, reflect and revise their perspective to construct a deep recognition of business functions and responsible management.

The branches represent the multiple approaches that can be used to achieve responsible management and sustainable development in line with PRME principle 4 'research to find the solution to contemporary issues'. The development of the branches should be a cross-disciplinary implementation that begins in the second year and ends in the final year, so that students will be equipped with the skill of developing a strategy based on the application of business theory to sustainability issues. The course design should be based on linking the content to a specific topic and adopting an experiential

learning approach to emphasise PRME principles 1 ‘purpose’ and 3 ‘method’ (Killian et al., 2019). Lastly, the leaves represent innovation and new opportunities for future development. The design of this component of the course is focused on exploring new business models in order to achieve responsible management and SDGs. By the end of this process, students will have identified their field of interest and investigated their specialist topic.

Business education with a PRME orientation will affect the structure of the programme. According to Carruthers et al. (2017) “the inclusion of sustainability and social responsibility and in management and business education represents a change in perspective and practice” (p. 170). A business programme in the form of a module is beneficial for constructing a PRME curriculum, which emphasises a cross-disciplinary inquiry into the issues of responsible management and sustainability, because modules can deliver more flexible and interdisciplinary learning than traditional courses (French, 2015). Killian et al. (2019) demonstrate the ability of a module to engage undergraduate students in learning about responsibility, sustainability, SDGs, teamwork and problem-solving skills by collaborating in projects with partner organisations. These projects are mainly based on using social media for the social good and further extending the use to sub-topics according to partners' needs, and every sub-topic is linked to the related SDG to contribute to sustainability. This module is effective in the establishment of a PRME curriculum and the delivery of SDG contents.

Molthan-Hill et al. (2017) presented a dedicated core module to develop a PRME curriculum by working with PRME networks and client businesses. A core module enables broader content to be addressed, which can correspond to other existing modules in the PRME curriculum (Rusinko, 2010). Notably, Rasche et al. (2013) affirm

that business schools that provide ethical education in their programme should make the course mandatory, rather than elective, because the integration of ethical education in a few elective courses would be inconsistent with the programme's learning outcomes. Students may be less prepared for PRME issues if they had to learn the PRME in an elective course than if the course was mandatory (Buono, 2017; Carruthers et al., 2017).

2.3.2 Aims of implementing a PRME curriculum in business schools

The aim of education for sustainability based on the implementation of the PRME curriculum in business education is not only composed of the notion of societal, economic and environmentally-sustainable development and the achievement of SDGs, but also responsible and ethical business. Deakin University (2017) has constructed a vision of ethics, responsibility and sustainability (ERS) on PRME and SDGs with the aim of "developing a sustainable, inclusive and ethical culture that ensures prosperity, creates societal benefit and minimises the environmental impact". This ERS framework has been adopted to integrate the ERS in core courses. It has three levels, the first of which is focused on the awareness of ERS normals from different perspectives, while the second involves a critical analysis of ERS normals with complex issues and the third emphasises the creation of new normals based on action; for instance, problem-solving or contributing to activities in relation to social justice.

Fornes et al. (2019) examined the implementation of ERS in the MBA programme curriculum with the aim of equipping students with the characteristics that are essential to become leaders who have a global perspective and the competencies of sustainable entrepreneurship and women's leadership. As well as ERS being embedded in the courses, individual development plans are utilised in the programme based on a leadership model to deliver the notion of ERS and students are then required to establish

their own development plan in the first year of working with a coach. This plan begins with them identifying their personal value and life purpose to continue to construct their goal and they need to analyse the impact of every decision they make to reach that goal from an ERS perspective, which enables them to learn to reflect on their behaviour.

Farrag and Obeidat (2020) analysed the business administration programme for undergraduates at Qatar University. This programme is devoted to ERS and is based on establishing learning outcomes to cultivate students to make ethical and socially-responsible business decisions by utilising two primary approaches to integrate ERS in the current curriculum. The first approach is learning with the project and cooperating with the client is the topic of a case study. In accordance with this approach, the learning objective in a management course is to embed sustainability in employees' attitude and behaviour, and the learning objective of an organisational behaviour course is to embed the notion of ERS in the development of leadership, decision-making, and the overall organisation. The application of this topic in the business curriculum emphasises the attitude, value and action of individuals toward ERS, green economics and technology. The second approach involves the application of Giving Voice to Values (GVV) in the curriculum, which emphasises the development of leadership and ethics to contribute personal value to the organisation based on making ethical decisions from a value-driven perspective (Gentile, 2017). Students should be equipped with the aptitude to recognise the difference between personal and organisational values based on a learning process of value conflicts to determine the point at which an ethical and responsible decision can be made (Gentile, 2017). The GVV approach highlights the fact that the implementation of personal values is vital to equip students with the skill to propose ERS values that are acceptable in the organisation and workplace in order to accomplish

real action. Students' awareness of ERS and ERS-related behaviour can be increased by implementing these two approaches. Therefore, the inclusion of a GVV elective course in the business programme can succeed in embedding ERS in the curriculum (Farrag & Obeidat, 2020).

According to Setó-Pamies and Papaoikonomou (2020), SDGs represent new ethical responsibilities for management education due to the progress of industrial operations. More corporations are beginning to highlight the inclusion of SDGs in their development strategy, which raises the need for business graduates to receive an SDG-orientated education. The application of SDGs to develop the curriculum can enable the concepts of responsibility and ethics to be embedded in the business programme. SDG-orientated education is beneficial for increasing students' understanding of current challenges and drawing their attention to the personal contribution they make to social and environmental impacts by learning about SDG issues. Furthermore, besides the implementation of SDGs in business, SDG-orientated education can also increase the interaction between universities and industry. For instance, the Laurea University of Applied Sciences developed a growth leadership programme based on sustainability, responsibility and ethics with a framework of SDGs 8, 11, and 12. The purpose of this programme was to deliver knowledge and skills of sustainable development, corporate social responsibility and ethical agency with the aim of equipping students with adaptability in terms of social, leadership, entrepreneurial and problem-solving skills (Ekström, 2020). SDG-orientated education has a positive impact on students' attitude toward personal responsibility (Sánchez-Hernández & Maldonado-Briegas, 2019), and Ndubuka and Rey-Marmonier (2019) also emphasise the need to develop a curriculum based on SDG 4 to improve individuals’ quality of life and well-being, since these are

the basic essentials to set them free to achieve their value, which is the root of social progress.

Laasch and Conaway (2014) define social responsibility as considering all stakeholders' value (SV) when making decisions. The social responsibility of HEIs is discussed in the literature and the core of advancing social development and well-being in the curriculum is also highlighted (Sharma, 2020; Topuzova et al., 2020). The design of the curriculum should be linked to the issue of social progress to equip students with the ability to play an active role in transforming society for the better (Pee & Vululleh, 2020). According to Sonetti et al. (2020), Italian universities' mission is influenced by sustainability; for instance, their research and teaching involve students' engagement, and citizenship is mentioned as their third mission and defined as their contribution to socio-economic development (Setó-Pamies & Papaoikonomou, 2016).

Sharma (2020) observes that a socially-responsible curriculum should consider the well-being of the entire community, since the purpose of the programme is to solve the social problems that affect the community's well-being and brand image. Students' sense of responsibility and ethical ownership can be constructed by cooperating with the community to solve social problems in a socially-cognitive development process. In terms of specific community content, researchers emphasise the approach of service-learning projects, in which students are engaged in a service task to learn the process of planning to meet needs, actions, and reflection (Kaye, 2010). Types of service tasks include community service, volunteerism and internships (Wurdinger & Carlson, 2009). Service-learning is mutually beneficial for providers and recipients (Sigmon, 1979). Previous researchers emphasised the collaboration of universities and communities in service-learning, which gives students the experience

of civic engagement to reinforce their civic values and citizenship, while simultaneously strengthening the community's development (Furco, 2015; Kaye, 2010). Wright (2007) also observes that it is essential to investigate the relationship between universities and communities in SD due to the role the former play in responding to social needs, as well as being an integral part of the community.

2.3.3 Design of a PRME curriculum for a business programme course

Morris and Reid (2020) discuss the embedding of social responsibility in the re-developed curriculum of an undergraduate business programme in Australia, which is based on the PRME framework and SDGs to further develop the vision and mission of the programme to highlight personal responsibility. The vision is "Real-world relevance with impact" based on educating business graduates with the mission of responsible local and global citizenship. Multidisciplinary thinking and "the Vertical Core" are the central notions of designing the curriculum and students are required to implement this multidisciplinary study by building one major and two minors that can enable them to develop their specialist knowledge and cross-disciplinary thinking. A compulsory course of the capstone is designed to give students the opportunity to practice using multidisciplinary research to solve complex issues from the perspectives of social impact and business responsibility. In terms of "the Vertical Core", there is a set of three compulsory courses. Students are required to take "Business in a Changing World", which is the core of the business programme, in the first to the third years. "The Vertical Core" involves a discussion of SD, ethics and responsibility based on the relationship between business and society by introducing contemporary complex issues. Notably, the curriculum design in the business programme is divided into four stages to highlight the different core of the teaching and learning contents. In the first year,

the students are not required to solve complex issues, but instead, to focus on building a basic business from an ethical perspective. This signifies the importance of cultivating students by delivering the proper perspective of a business definition and its role in society. In the second year, the course begins by introducing the ethical frameworks and responsibility in the business context, and in the third year, the course is focused on learning by action. Students are required to work in a group to solve complex issues by applying ethical frameworks and responsibilities. Finally, they are given industrial placements to practice their knowledge and skills in the real world.

According to Pee and Vululleh (2020), leadership ability underpins the idea of responsible decision-making, and Hategan and Hategan (2021) affirm that business education should not only emphasise developing the curriculum, but also focus on the coaching process to cultivate students' sustainable leadership. The curriculum should begin by building economic specialisation and then move to management courses with the application of ethics in the business context. Moreover, the learning objectives of the coaching process should involve leadership attitude, company goals and personal development. Company goals may refer to the learning outcomes. The next learning objectives should involve decision-making, consultancy and reflexive leadership, since universities are now more open to transferring and producing knowledge with external stakeholders, such as businesses and government. The examination of universities' activities also involves civil society factors (Carayannis & Campbell, 2012) and the natural social environment (Carayannis et al., 2012). The trend presented in the third mission involves accelerating the growth of entrepreneurial universities (Ranga, 2013) with a mission to contribute to socio-economic development through entrepreneurial activities (Guerrero et al., 2015).

Previous researchers have discussed the application of entrepreneurship to develop SD and personal responsibility. The literature reveals that entrepreneurship can assist in educating students of the notions of sustainability and responsibility (Sánchez-Hernández & Maldonado-Briegas, 2019; Rashid, 2019; Wong, 2017) and, as such, it has become a component that drives sustainable business in EU countries (Ionescu et al., 2020). Entrepreneurs who adopt an SD perspective create opportunities from the perspective of a triple bottom line (Urbaniec, 2018). Igwe et al. (2019) affirm that there is a relationship between entrepreneurship and PRME principles 1 and 2, which aim to cultivate future leaders. As such, entrepreneurship can be an approach to mitigate the failure of the curriculum of responsible management education to develop students' abilities and skills. When Sánchez-Hernández and Maldonado-Briegas (2019) studied a voluntary education programme which promoted SD by an entrepreneurship project and highlighted the entrepreneurial culture in the learning process, they found that it had succeeded in increasing the students' attitude toward social responsibility. However, there is a need to consider that the use of an entrepreneurship approach in the curriculum not only develops a mindset of sustainability and responsibility in students (Hermann & Bossle, 2020; Rashid, 2019), but also increases their employability. According to Hermann and Bossle (2020), firms in the industrial sector have a different perspective of sustainability, since they are focused on their operational capability. Therefore, the component of entrepreneurship can be connected to increasing employability in the industrial context (Sánchez-Hernández & Maldonado-Briegas, 2019). In other words, entrepreneurship has become a factor in developing ERS content in the curriculum to foster students' perspective of sustainability and employability.

2.4 Summary

The contents of this chapter involved the development of Education for Sustainability and the implementation of a curriculum in the business programmes of HEIs, which can be summarised in four points.

Firstly, ESD has been a root integrated into HEIs to promote education for sustainability. The progress of ESD in higher education and the main concepts of SDGs were illustrated in this chapter.

Secondly, both ESD and SDGs are focused on the curriculum dimension. A holistic change in the curriculum is essential for HEIs to construct education for sustainability because ESD is not disciple-based; instead, it is dynamic and subject to changing social, economic and environmental challenges. Therefore, the development of ESD needs to be integrated into the entire curriculum to build a cross-disciplinary collaboration.

Thirdly, the concept of SDGs is the main direction for universities devoted to ESD. The localisation of SDGs, which involves considering the different contexts and circumstances in universities and the response to local needs. has been emphasised as the best approach to reform the curriculum,

Fourthly, the basic framework to transform business education consists of the six principles of PRME, which emphasise the notions of ethics, responsibility and sustainability (ERS). In terms of sustainability, PRME is consistent with ESD's aim to achieve the SDGs.

Finally, business education, which is devoted to education for sustainability, applies the PRME framework to develop the curriculum and establishes the SDGs as its objectives. With regard to the development of PRME in business education, the aim of education for sustainability is not only composed of the notion of societal, economic and environmentally-sustainable development and the achievement of SDGs, but also responsible and ethical business.

Business education has been criticised as failing to cultivate businesspeople for the future with an ERS attitude, knowledge and behaviour. Although sustainability is embedded in the curriculum more explicitly than it was before, there are still gaps, which has led to the review of the theoretical and empirical literature in this chapter to explore the research objectives. The development of ESD and the implementation of a PRME-based ESD curriculum in the business programme will be investigated in the next chapter.

CHAPTER 3

METHODOLOGY

The aims of this research are to produce a curriculum of sustainability for application to college business programmes by integrating ESD and the PRME and to examine the effectiveness of the content design based on the learning outcomes of sustainability of international Chinese college students at a private university in Bangkok, Thailand. Mixed methods are applied to address the following research questions:

A) What are the learning outcomes of ESD in a business programme of higher education?

B) What is a PRME-based ESD curriculum for business programmes for international Chinese college students?

C) How does an ESD course intervention develop international Chinese college students' sustainability learning outcomes?

D) Are the sustainability learning outcomes of the international Chinese college students in the ESD intervention better than those of the students in the regular college business course?

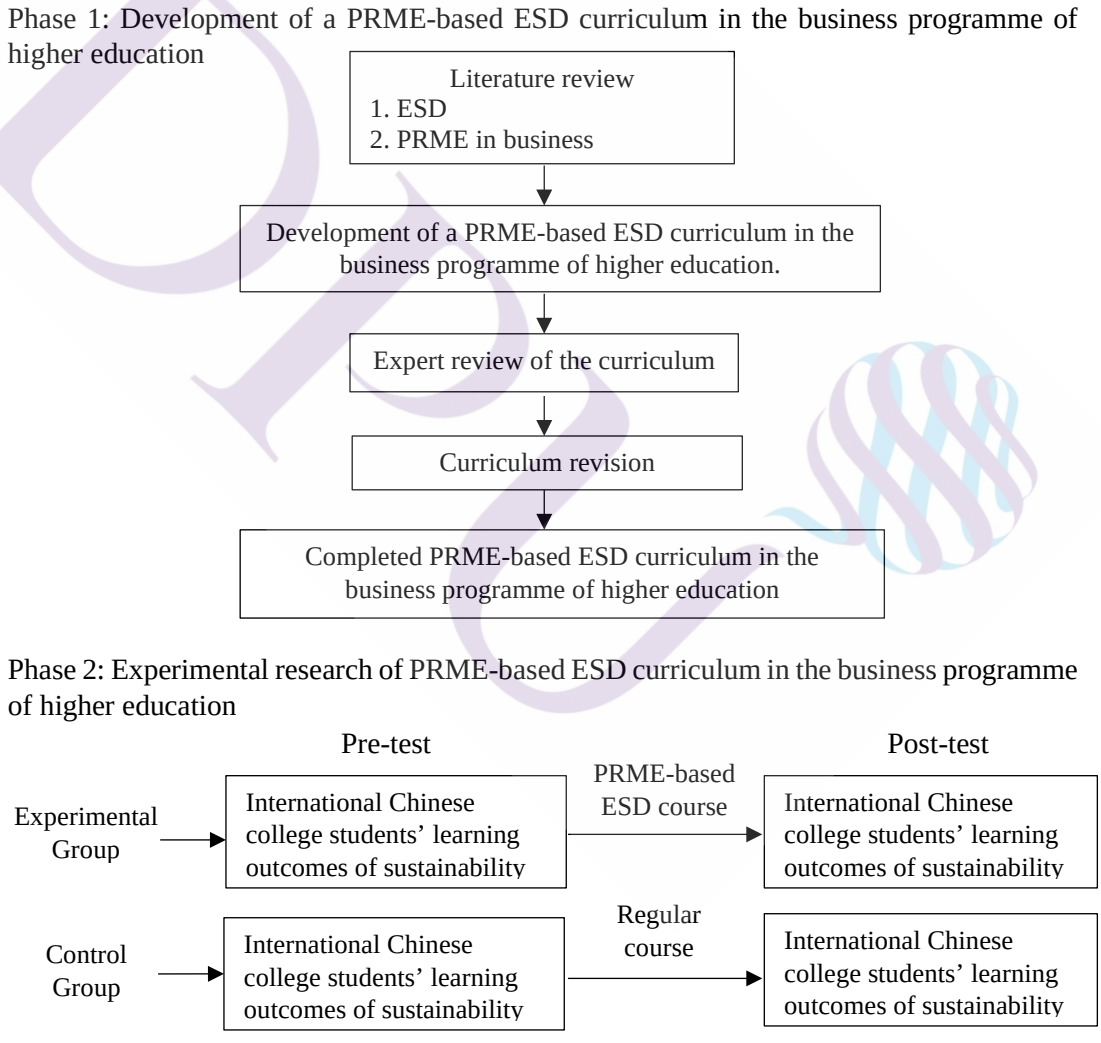
The research framework, participants, procedure, instruments, analysis of data and roles of the researcher are described in detail in the next sections.

3.1 Research Framework

The research framework is shown in Figure 3.1. The first phase involves the use of a qualitative approach to develop a PRME-based ESD curriculum, and the second phase involves the implementation of a quasi-experiment and the use of quantitative methods to investigate students' learning outcomes of sustainability.

Figure 3.1

Two-phase research framework used in the study



3.2 Participants

A quasi-experimental design with non-equivalent control groups was applied and conducted at a private university in Bangkok. Approximately 96 international Chinese college students aged 20-21 years and enrolled in the business programme were invited to participate in this research. These students are juniors with a fundamental knowledge of sustainable development and management. They were divided into two groups based on their registered classes: 46 students were assigned to the research intervention of an ESD course based on PRME as the experimental group, and the other 50 were assigned to the regular course as the control group. The researcher had presented them the informed consent form of research participant shown in Appendix II to confirm their agreement to participate in the experiment.

3.3 Research procedure

The research procedure was divided into two phases. The development of the ESD curriculum in the business programme based on PRME was investigated in the first phase using a web-based content analysis to collect the empirical data in relation to ESD and PRME in the business programme and course. This was based on a list of PRME champion schools in 2020–2021 and the valuable example of the integration of SDG into a business school in accordance with the methods of Wersun et al. (2020). An expert review was subsequently conducted to examine the reliability and validity of the curriculum. In the second phase, the influence of the PRME-based ESD curriculum on the development of the students in the business programmes' learning outcomes of sustainability was investigated using the instruments of survey, test and rubric for the final presentation. The quasi-experiment intervention was administered in 15 lessons: 2 lessons per week and 3 hours per lesson.

3.4 Development of the PRME-based ESD curriculum

The curriculum in this study was developed by a web-based content analysis, which is described in detail below.

3.4.1 Web-based content analysis

A web-based content analysis was applied to examine the learning outcomes of ESD and the implementation of PRME in the business programmes of the university. A content analysis is defined as a research technique for explicating unstructured mass materials and making inferences from communication characteristics (Krippendorff, 2018). Researchers can detect the presence of themes or concepts through the inferences of materials (Krippendorff, 2018). These inferences allow the researcher to discover further the change in a phenomenon to respond to the research questions. Content analysis can be driven from either empirical or theoretical questions, which can assist to discover the changes in education (Stemler, 2015). For instance, Stemler and Bebell (2012) applied content analysis to investigate school mission statements and then determine the current trend of education development. The results can provide a clear path of the current circumstance including the origin and effects (Mayring, 2014). Past research has emphasised that content analysis was especially useful for research on the learning outcomes of current courses (Crittenden & Wilson, 2006). Research on the existing or potential learning outcomes can be conducted with content analysis to make strategic planning for curriculum development (Archambault & Masunaga, 2015).

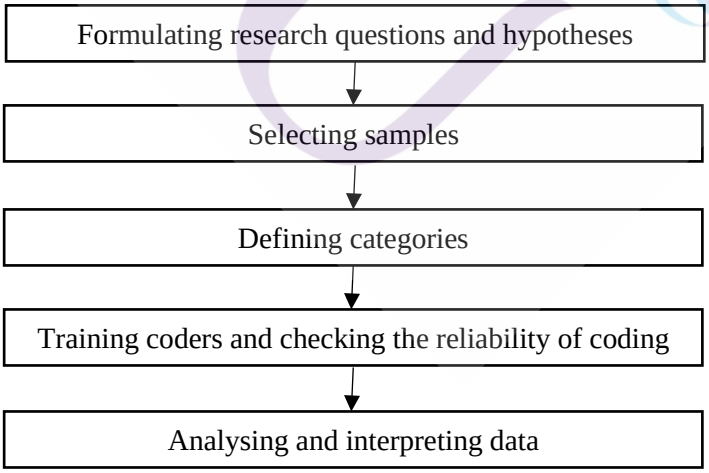
Since the Web 2.0 revolution, it has been performed using various materials, such as newspapers and social media. It has also been widely used to examine websites,

online activity and social networking (Neuendorf, 2016). Wu et al. (2010) applied web-based content analysis to explore further the curricula of business schools in the leading accreditation systems as the research samples to collect data from the samples' school websites worldwide. School websites serve as an official source of information, with the advantages of accessibility to the public and regular updating (Wu et al., 2010). Web-based content analyses have generally been used for research curricula and course outlines (Ndou et al., 2019; Tang & Sae-Lim, 2016). This research technique is effective for examining the current status of programme structures and is generally implemented in studies that involve curricula or course documents (Robson & McCartan, 2016). Therefore, this study performed a web-based content analysis to explore the current status of curricula in business schools.

McMillan (2000) proposed a five-step procedure to strengthen a web-based content analysis, as shown in Figure 3.2.

Figure 3.2

Process of web-based content analysis



Note. Adopted from: McMillan, S. J. (2000). The microscope and the moving target: The challenge of applying content analysis to the World Wide Web. *Journalism & Mass Communication Quarterly*, *77*(1), 80-98. https://doi.org/10.1177/107769900007700107.

The first step in the process involves formulating the research questions or hypotheses. Rather than starting by identifying the research questions, they can be developed based on "finding a context for them, either in existing or emerging communication theory" (McMillan, 2000, p. 81). Formulating a research question can begin with identifying the interrelation of two or more variables. This is a conceptual process of considering diverse phenomena based on some available contexts (Krippendorff, 2018; Neuendorf, 2016). The second step entails selecting the samples and determining the appropriate sample size, depending on the research objectives. The third step involves defining the categories, which can primarily be divided into coding and context units. A coding unit can be a word, a sentence, or a paragraph, which is the smallest category in the process, while context units are larger than coding units and provide the content for them. For instance, if the context unit is a website, coding units may describe its contents. The fourth step entails training coders and verifying the reliability of their coding. Coders should be provided with instructions and coding sheets to ensure their understanding. Moreover, intercoder reliability should be examined for the efficient interpretation of the content. In the fifth step, the data are analysed and interpreted using statistical tools that are selected by considering the types of data and the research questions. The web-based content analysis in this study was validated by the methods suggested by McMillan (2000).

3.4.2 Sampling

The sampling in this study was based on two databases. The first database, PRME (https://www.unprme.org/signatory-members), is the UN's initiative to drive ESD by the implementation of SDGs and responsible management education in business and management schools based on the establishment of a champion group in

each university. The second database (https://sdgdashboard.sju.edu/?page_id=2071) is a reporting and analytical platform for global business schools to convey the impact of engaging and practising SDG based on PRME principles. Since both of these databases are associated with the integration of ESD and PRME in global universities, the representative samples were determined by referring to them. The web-based content analysis in this study was designed based on the research question to establish a selective inclusion including language in English, programmes in the field of business, and content of curriculum to unify the samples (Table 3.1).

Table 3.1

Inclusion criteria of sample selection

Items	Selective inclusion
Language	English
Programme	Undergraduate in international business management, business administration and commerce fields
Content	Information on learning outcomes and the curriculum is available on the programme websites.

Note. This table demonstrates the inclusion criteria of sample selection for the web-based content analysis.

The content of the learning outcomes of the programme was selected. The result of the web-based scan of the two databases was a list of 45 business schools, but the final sample consisted of 10 undergraduate business programmes of 10 universities after the selective inclusion of the sample selection. (Table 3.2).

Table 3.2

Sample description

Nr	Undergraduate programme	School	Country	Duration
1.	BSc in International Business	Copenhagen Business School	Denmark	6 semesters
2.	Bachelor of Business	Deakin Business School	Australia	3 years full-time or part-time equivalent
3.	Business, BS	George Mason University	United States	4 years full-time
4.	BA in Business Management	Glasgow Caledonian University	United Kingdom	4 years full-time
5.	Bachelor of International Business	La Trobe Business School	Australia	3 years full-time
6.	BSc in International Business Management	Newcastle Business School	United Kingdom	3 years full-time
7.	BSc in International Management	Nottingham University Business School	United Kingdom	3 years full-time
8.	Bachelor of Commerce	Sobey School of Business, Saint Mary's University	Canada	4 years full-time
9.	Bachelor of Business Administration	University of Dubai	United Arab Emirates	4 years full-time
10.	BA in International Business	Nottingham Business School, Nottingham Trent University	United Kingdom	3 or 4 years full-time

Note. This table presents the sample description for the web-based content analysis.

These 10 samples originate in the country that is a member of the United Nations (United Nations, 2022) and with the aims to achieve SDGs by the year 2030, which is the same as Thailand (United Nations, 2015). In these 10 samples, 9 are in the country that has better progress of SDGs than Thailand, namely, Denmark, Australia, the United Kingdom, Canada and the United States (Sachs et al., 2021). Investigating these 9 samples can assist in determining a pathway of the foundation learning outcomes towards sustainability in the business programmes in an effective development system. The last sample is from the United Arab Emirates, which in Asia is the same as Thailand. This sample can offer the SDG implementation in the business programmes in the Asian context. Therefore, this study investigated these 10 samples, whilst considering the better progress of SDGs embedding in the business programme and the localisation implementation in Asia.

3.4.3 Definition of categories

A content analysis has one context unit and one coding unit. The context unit of a website includes the coding category of learning outcomes. The curriculum content and syllabus are coded according to the categories defined when the content is available online.

The coding of one category is described as follows:

- Learning outcomes of the programme (Lo)

  Learning outcomes can be defined as “what learners are expected to know, understand and demonstrate at the end of a period of learning” (Gosling & Moon, 2002, p. 17) and “what a pupil will be able to do as a result of his or her teaching”

(Lister & Cameron, 1986, p. 10). The programme's learning outcomes include the aim, purpose and relevant students' objectives.

- Cognitive learning outcomes (Co)

Cognition is described as the "knowledge and thinking skills to understand the SDG and related challenges" (Rieckmann, 2017, p.11).

- Socio-emotional learning outcomes (Se)

Socio-emotion refers to learners' social skills that enable them to "collaborate, negotiate and communicate to promote the SDGs as well as self-reflection skills, values, attitudes and motivations to develop themselves" (Rieckmann, 2017, p.11).

- Behavioural learning outcomes (Be)

Behaviour is defined as the actions learners take to achieve SDGs (Rieckmann, 2017).

The content coding is shown in Table 3.3.

Table 3.3

Coding of contents

Variable	Code
Learning outcomes	Lo
Cognitive learning outcomes	Co
Socio-emotional learning outcomes	Se
Behavioural learning outcomes	Be

Note. This table presents the coding of contents which include the learning outcomes (Lo), cognitive learning outcomes (Co), socio-emotional learning outcomes (Se) and behavioural learning outcomes (Be).

3.4.4 Procedure of coders' training and reliability

According to Krippendorff (2018), the qualifications and training of coders have an effect on the data replicability and consistent inferences. Coders' qualifications should include education and profession (Peter & Lauf, 2002). The first qualification required by the coders in this study is English proficiency because the selected contents are in English. Secondly, they must be specialists in the management field and have experience of teaching in higher education. These qualifications are set to ensure that the coders can understand the research questions and content.

The process of training the coders in this study involved six steps: 1) the purpose of the web content analysis was explained and a sample of the content was provided to ensure coders' familiarity; 2) the full coding of one sample was analysed in each session; 3) the definitions of a coding category and dimensions were introduced to coders via the content sample; 4) coders were instructed to process the coding of the content sample by applying the coding category and dimensions; 5) the coding of the content sample was a pre-test for the coders to ensure that the coding category and dimensions were consistent with a good set; and 6) coders were asked to independently modify the setting of the category and dimensions and establish the final set after the pre-test demonstration. This training was undertaken based on the suggestions of Riffe et al. (2008).

Reliability refers to how well coders implement a coding scheme to make a consistent interpretation. An independent content analysis should involve at least two coders to ensure that the coding scheme can be used as a measurement tool (Neuendorf, 2016). Two intercoders participated in the content analysis in this study. The content

sample provided for the coder training was separate from the sample list to ensure that the interpretation was reliable. According to Riffe et al. (2008), the actual study content should not be provided in the training sessions because a coder should code without having a prior impression. Cohen's kappa (Cohen, 1960) is used to statistically analyse the strength of agreement based on the following criteria: 0.81 to 1.00, almost perfect agreement; 0.61 to 0.80, substantial agreement; 0.41 to 0.60, moderate agreement; 0.21 to 0.40, fair agreement; 0.00 to 0.20, slight agreement; and <0.00 poor agreement, as proposed by Landis and Koch (1977). The development of Cohen's kappa removes the consideration of a chance agreement and applies a multiplicative term to account for coders' differences by providing a range of coefficient from −1 to 1 (McHugh, 2012; Neuendorf, 2016). Cohen's kappa is one of the most used statistical tools for intercoder reliability because it is sufficient for the type of categorical data and can be employed with multiple coder statistics to effectively report the final reliability coefficient (Dunn, 2004; Neuendorf, 2016). Therefore, Cohen's kappa is chosen as the statistical tool to ensure intercoder reliability in this content analysis.

Pilot coding was conducted to examine the reliability of the intercoders using a randomly-selected sample. According to Riffe et al. (2008), the content of a coder reliability assessment should be selected randomly to avoid human biases. Therefore, pilot coding was applied to one randomly-selected separate sample from the sample list. All the content of the pilot coding was applied to examine the reliability of this study and it was found that Cohen's kappa coefficient was 0.71 (substantial agreement), indicating that the intercoders in this content analysis were able to successfully produce dependable and consistent interpretations.

A. Background of intercoders

It is essential for coders to have an appropriate background to ensure that they have the necessary cognitive abilities for the content analysis (Krippendorff, 2018). Since the content analysis in this study is focused on students' learning outcomes in the business programme, intercoders are required to have a background in business education and experience of teaching in higher education to demonstrate the desired cognitive abilities. Coders' education and professional background are the main factors that ensure that the coding is highly reliable (Peter & Lauf, 2002). The two intercoders recruited for the content analysis in this study have a background of education and teaching experience. The first coder has a Master's degree in innovation management and entrepreneurship and is both a lecturer in the international business department at the university for 5 years and a Ph.D. candidate in the education management field. The second coder has a Master's degree in management and is both a lecturer in the finance and accounting department at the university for 6 years and a Ph.D. candidate in the management field. They both attained their Master's degree from a UK university. Hence, their education, profession and English proficiency satisfy the qualifications coders require for the content analysis in this study.

B. Reliability of coding

The two intercoders were required to adhere to the coding instruction to interpret the content of a sample of 10 undergraduate business programmes (Table 3.4.2.2) after the training and pilot coding of the qualified coders. One category that corresponded to one context unit (website context) was created and the website context unit included one coding category of learning outcomes. The interpreted content was subject to Cohen's kappa reliability and the intercoder reliability for the website context

units was 0.83 (almost perfect agreement). The details of Cohen's kappa coefficient of each category are shown in Appendix III. The results indicate that the interpretations in each category were highly consistent and capable of replication due to the high intercoder reliability based on $\kappa = 0.83$.

3.4.5 Analysis and interpretation of the data

The coders were given standardised coding worksheets after the coder training and pilot coding. Each coder was required to 1) independently identify the content on the website in relation to the coding category; 2) independently code the content based on the definition of the coding category; and 3) independently code the coding category of the learning outcomes of the UNESCO ESD goals (Rieckmann, 2017). The context unit was the website with one coding unit of learning outcome. The aim and purpose of the programme and the relevant students' learning outcome or objective published on the website of sample programmes were analysed and coded.

3.4.6 Mapping of the curriculum module and learning outcomes

Fifty-six learning outcomes were selected for the business programme as a result of the content analysis. Twenty-one were cognitive, twenty socio-emotional and fifteen behavioural. The course description was used to map the current curriculum module and the learning outcomes to determine the interrelations. The mapping that had been initially compiled was given to two external experts and three internal experts, who had a specific ESD and business management background to undertake valid mapping. These experts' research field and background are shown in Table 3.4, and their comments on the mapping, shown in Appendix IV, were used to revise the current curriculum module and learning outcomes, as illustrated in Appendix V.

Table 3.4

Background of experts for the valid mapping of the curriculum and learning outcomes

Expert	Research field	Educational background	Professional experience
A	Corporate social responsibility; corporate environmental management; green marketing	National Taipei University, Business administration, Ph.D.	Assistant Professor of Master of Business Administration (MBA) and Dean of the Chinese international college at Dhurakij Pundit University in Thailand, with 5 years of experience of teaching business administration and 7 years of experience of green strategy research.
B	Sustainable development; international business management	Zhougnan University of Economics and Law, Ph.D.	Associate professor in the department of marketing and distribution management and CEO of the TICAR research association in Taiwan, with 24 years of experience of industrial business management and 18 years of experience of teaching sustainable development and business administration.
C	Leadership; international business management	National Kaohsiung University of Science and Technology, Ph.D.	Manager of an international corporation in Taiwan, with 15 years of experience of industrial business management and 10 years of experience of teaching business administration.
D	Sustainability; entrepreneurship	University of Lllinois at Urbana-Champaign, Technology Management, MS.	Director of the Bachelor of International Business Program in Dhurakij Pundit University in Thailand, with 5 years of experience of teaching sustainability management.

Expert	Research field	Educational background	Professional experience
E	Sustainability; green university	Dhurakij Pundit University, MBA	Lecturer of the Bachelor of International Business Program in Dhurakij Pundit University in Thailand, with 2 years of experience of teaching sustainability management.

Note. This table demonstrates the background of five experts who construct the valid mapping of curriculum and learning outcomes.

3.5 Course design of ESD based on the PRME

The aim of this study was to construct a course design based on ESD learning outcomes and the PRME principles to develop education for sustainability in business programmes. Therefore, the course design consisted of a three-phase model based on a correlation of sustainability and the PRME principles proposed by de Paula Arruda Filho (2017) to enable the brand management course to be the experimental course in this study.

The need for brand management to consist of an integration of sustainability and responsible management has been emphasised in previous literature on the grounds that the implementation of responsible management in business has a positive impact on both brand value and an improved business performance (Goworek, 2017). Loučanová et al. (2021) suggest that sustainable value can be achieved by branding activities that promote plans that have different effects on stakeholders. Nevertheless, there is still a gap in brand management knowledge related to aspects of sustainability and responsible management. Rowledge (2017) observes that numerous business leaders face a huge challenge when attempting to balance sustainability and the

development of brand value. This situation raises the need of a brand management course based on sustainability and responsible management. Therefore, the aim of this study was to design and develop a brand management course to fill the aforementioned gap and educate students of the notions of sustainability and responsible management in the business field along with PRME principles.

3.5.1 PRME principles: Purpose and value

The aim of the principle of purpose and value is to increase the awareness of research opportunities of ERS among students and engage and cultivate them to become leaders and global citizens (PRME, 2020b). Therefore, it was necessary for the teaching content to be focused on a new perspective of the relationship between ERS and business to further emphasise that personal value is significant in both the aforementioned roles. The class began with an introduction to ERS from a personal life experience approach, when the students were required to share the business strategies they had experienced recently in order to determine the current trend. They were introduced to the ERS trend, which is linked to the development of brand management. Furthermore, activities on the world cloud enabled them to share their ideas about the role of ERS in business and daily life. The relationship between ERS and business was introduced to build on these activities by cultivating a win–win perspective among the students in terms of ERS and business. This endeavour included contents of leadership and the personal value of global citizens. Students were required to research the implementation of ERS in brand management and operational strategies by means of a web information search and then share the corresponding results on a discussion board. Furthermore, at the end of the principle of purpose theme they were required to share their ideas of how individuals contribute value as leaders or global citizens to promote

ERS. At this stage, they were expected to have a new perspective of the role of ERS in business and the purpose of business activities.

The purpose of introducing the theme of the principle of value was to educate the students to have multiple perspectives of the content of responsible decisions and the UN's sustainable development goals (SDGs). The principle of value is related to three main contents. Firstly, shareholders and stakeholders are required to respond to the concept of responsible decisions and management. The definition of responsibility in enterprises has shifted from shareholders to stakeholders, who have become the basis of students' understanding of the effect of responsible decisions and good management. The shareholders of an enterprise are individuals or organisations that own shares in it (MBN, 2021), and maximising the shareholders' interests has always been deemed to be the primary responsibility of enterprises in a capitalist system, which is controversial and gives an erroneous impression of business. However, the notion that enterprises should consider the interests of all their stakeholders is rapidly gaining popularity due to the emergence of responsible management and SD. Stakeholders are individuals or organisations that are affected by the enterprise (Freeman, 2010). The teaching content related to shareholders and stakeholders began with a discussion of capitalism to reflect the effect of responsible management on society, the economy and the environment. Moreover, the anti-CEO playbook proposed by Ulukaya (2019) was introduced with a focus on the perspective of stakeholders' benefits based on the concept of responsible management.

Secondly, brand management and SDGs were presented. Theories of brand equity and positioning were firstly introduced to enable the students to comprehend the

role of brand management in the creation of value. The SDG content was presented based on sustainability reporting to demonstrate the implementation of SDGs in enterprises. This was followed by an examination of the effect of SDG implementation on brand equity, positioning and management based on group discussions, in which every group was required to find an enterprise's sustainability report and critically examine the SDG content using brand theories. Students were required to present their results via an oral presentation to show how SDG practice connects with brand management. Meanwhile, they were given individual assignments to analyse a brand using the positioning theory and were required to further examine the SDGs the brand focuses on to determine the reason for its focus. They were then required to answer the question, "Is it consistent with their brand positioning?" based on the analytical results.

Thirdly, different generations' consumption behaviour was introduced to explain the change in consumers' behaviour to include green and pro-environmental behaviour. The students were required to post their ideas about the current trend of consumer behaviour on the discussion board before the content was introduced. Additionally, a reflective observation of personal green behaviour was undertaken by the sharing of experiences. For the theme of the principle of value, the students needed to know the value of making responsible decisions and the SDGs and apply the related theories to examine their implementation in enterprises. Personal behaviour was highlighted in the content to enhance the awareness of the effect of business activities.

3.5.2 PRME principles: Methods and research

The aim of the principle of methods is to examine the social, economic and environmental impact on SD and responsible management (PRME, 2020b). The

teaching content introduced SDGs in different contexts, including the current progress, strategies, challenges and gaps. The progress of SDGs in various regions would firstly train students to have an extensive international perspective in order to limit the topic to the influence of multinational corporations. Therefore, the content of the section on multinational corporations included the strategies of brand management, operation and the effect of business activities on society, the economy and the environment in different regions. Additionally, in the group activity, students were instructed to search for multinational corporations that were recently involved in SD or responsible management issues. Each group was required to present its findings by providing short answers to questions in four parts: 1) introduction of the issue; 2) effect on society, the economy and the environment in the region; 3) brand values; and 4) recommendations. The students had to explain why these enterprises should consider integrating SD and responsible management as part of risk management and the key for long-term development. Continuing the discussion of the effect of SD and responsible management on enterprises, the next section was focused on the relationship between SD and responsible management, and between consumers' decision-making and brand loyalty. Students were required to reflect on their consumer behaviour on a discussion board by answering two questions: Have you ever bought products from brands that caused critical issues of SD and responsible management? Will you continue to buy their products in the future (and why)? Moreover, the trend of brand identity was also introduced, including the concepts of green brands and greenwashing. The theme of the principle of methods was included to enable students to identify the challenges and gaps of SD and responsible management in different contexts. The aim was for students to

learn the impact of business activities on society, the economy and the environment, and reflect on the roles of consumers and producers.

The principle of research connects society and enterprise issues with SDGs to create sustainable value. The main approach in designing the content of the principle of research was derived from the idea of rethinking the way we engage in business. The two main contents were 1) business models; and 2) SD and social responsibility. Firstly, business models focused on introducing innovative means to engage in business, which included social enterprises, B corporations and non-profit organisations. A change of business models is the root of transformative business activities to accomplish SDGs rather than short-term plans, such as donations and cause-related marketing, which are invalid means of SD from the long-term perspective because they cannot address the critical issues of SDGs (Nooyi & Govindarajan, 2020). Cloud activity enabled students to share their ideas on the challenges of SD in the different models at the end of the teaching content.

Secondly, SD and social responsibility were applied in the business models. The content introduced different enterprises, including the issues they have solved, types of business models and brand strategies. In the group activity, students were required to search for social enterprises, B corporations or non-profit organisations in China or Thailand. The reason for choosing these two countries is that they are both linked to the students' life experience; hence, the latter became engaged in the learning process and offered reflective observations of enterprises in the regions that they have experienced. They were required to introduce more business models and social issues to discover the challenges and opportunities connected to SDGs and were further

required to answer short questions and give a group oral presentation. For this theme, the students were expected to have acquired further practical knowledge of business models that apply SD and social responsibility, thereby enabling them to understand how businesses can address social issues to improve public welfare and simultaneously make a profit.

3.5.3 PRME principles: Partnership and dialogue

The principle of partnership involves joining with stakeholders to develop sustainability and responsible management strategies to address real-world issues (PRME, 2020b). The teaching content included a guest speaker who was able to describe the implementation of sustainability and responsible management in enterprises to provide students with knowledge of the practice of sustainability and responsible management in the real business world. The students were required to submit the experience report about the guest speaker lecture. Furthermore, brand management in the digital age consists of communication to promote sustainability and responsible management. For the theme of partnership, students were required to join with external stakeholders and apply their corresponding knowledge to real-world issues.

The principle of dialogue is intended to promote ERS and SDGs to individuals or organisations. The aim of the principle of dialogue theme was to implement a process of the learning content. Students were required to submit a final report and provide a presentation, as well as a plan for brand management and sustainable development or responsible management. Furthermore, all groups were required to promote their ideas on the web platform as change agents of ERS and SDGs.

The last theme of the principle of dialogue was focused on providing active experimentation to enable the students to apply their knowledge of problem-solving, thereby contributing their personal value as global citizens and future leaders.

3.5.4 Experts' validity of the course design

The experts' validity of the course design in this study was examined based on the item-level content validity index (I-CVI) and the scale-level content validity index (S-CVI). The I-CVI was applied to measure the degree of relevance of each item in line with the research objective to build an instrument that can effectively examine the research objective (Lynn, 1986). Lynn (1986) suggests the use of a 3- to 5-point rating scale to measure the degree of relevance of experts. There should be at least three experts, but not more than 10. According to Polit and Beck (2006), "I-CVI is computed as the number of experts giving a rating of either 3 or 4 (thus dichotomising the ordinal scale into relevant and irrelevant), divided by the total number of experts" (p. 491). The criteria of I-CVI are 1.00 with 3 to 5 experts involved, and a minimum of 0.786 with 10 experts (Lynn, 1986). A 3-point rating scale (1 = irrelevant, 2 = relevant after correction, 3 = relevant) was used in this study to examine the degree of relevance of the items. The six experts consisted of three external and three internal experts, all of which had a specific ESD and business management background, as shown in Table 3.5. All of six experts are with a research background on sustainability or instructional innovation area and at least 2 years' experience in teaching sustainability management or the management field.

Table 3.5

Background of experts for the PRME-based ESD course design

Experts	Research area	Education background	Professional experience
A	Sustainable circular economy; marketing	National Cheng Kung University, Resource Economics and Management Ph.D.	Associate professor of the international business department and Dean of continuing education at the Chang Jung Christian University in Taiwan, with 17 years of experience of teaching international business and 1 year of experience of promoting sustainable universities.
B	Entrepreneurship and innovation management; Instructional innovation	National Chengchi University, Technology Management, Ph.D.	Assistant Professor of the department of business management at Tatung University in Taiwan, with 8 years of experience of teaching entrepreneurship and innovation management, including value creation and social entrepreneurship.
C	Sustainable tourism management; marketing	Ming Chuan University, Business Administration, Ph.D.	Assistant Professor of the department of tourism and hospitality at Taipei City University of Science and Technology in Taiwan, with 4 years of experience of teaching marketing, including sustainable development.
D	Brand management; green products	National Taipei University, Business Administration, Ph.D.	Director of Master of Business Administration (MBA) at Dhurakij Pundit University in Thailand, with 4 years of experience of teaching brand management, including green products and consumer behaviour.

Experts	Research area	Education background	Professional experience
E	Sustainability; entrepreneurship	University of Illinois at Urbana-Champaign, Technology Management, MS.	Director of Bachelor of International Business Program in Dhurakij Pundit University in Thailand, with 5 years of experience of teaching sustainability management.
F	Sustainability; green university	Dhurakij Pundit University, MBA	Lecturer of the Bachelor of International Business Program at Dhurakij Pundit University in Thailand, with 2 years of experience of teaching sustainability management.

In terms of S-CVI, it presents the proportion of overall items rated by the experts (Polit & Beck, 2006). There are two types of measures of S-CVI: universal agreement (S-CVI/UA) and average (S-CVI/Ave). The computed S-CVI/UA is the proportion of overall items that reach the relevance rating of 3 or 4 by all the experts. In addition, S-CVI/Ave is used to compute the average of all I-CVI on the rating scale (Polit & Beck, 2006). However, Polit and Beck (2006) propose that the S-CVI/UA calculation method is too conservative for most research, with many experts comparing it to S-CVI/Ave. Therefore, the S-CVI/Ave calculation method is applied in this study to present the results of S-CVI because more than 5 experts are involved. Lynn (1986) suggests that the criteria of S-CVI/Ave should be above 0.90.

According to the I-CVI results of the experts' validity of the course design, the minimum I-CVI is 0.83 (items 5, 7, 9,12, 14, 17, 19, 20, 22, 23, 27, 29), which shows that all 30 items reach the criteria of the minimum I-CVI of 0.78, while the number of S-CVI/Ave is 0.93, which is higher than the criteria of 0.90 (Table 3.6). The results of I-CVI and S-CVI/Ave are higher than the criteria, which indicates that the

course design has good content validity according to the experts. All their comments on the course design are shown in Appendix VI.

Table 3.6

Result of I-CVI and S-CVI/Ave of experts' validity of course design

Item	Expert A	Expert B	Expert C	Expert D	Expert E	Expert F	Number in Agreement	I-CVI
1	3	3	3	3	3	3	6	1.00
2	3	3	3	3	3	3	6	1.00
3	3	3	3	3	3	3	6	1.00
4	3	3	3	3	3	3	6	1.00
5	3	2	3	3	3	3	5	0.83
6	3	3	3	3	3	3	6	1.00
7	3	2	3	3	3	3	5	0.83
8	3	3	3	3	3	3	6	1.00
9	3	3	3	2	3	3	5	0.83
10	3	3	3	3	3	3	6	1.00
11	3	3	3	3	3	3	6	1.00
12	3	2	3	3	3	3	5	0.83
13	3	3	3	3	3	3	6	1.00
14	3	3	3	2	3	3	5	0.83
15	3	3	3	3	3	3	6	1.00
16	3	3	3	3	3	3	6	1.00
17	3	3	3	3	2	3	5	0.83
18	3	3	3	3	3	3	6	1.00
19	3	2	3	3	3	3	5	0.83
20	3	3	2	3	3	3	5	0.83
21	3	3	3	3	3	3	6	1.00
22	3	3	3	3	3	2	5	0.83
23	3	3	3	3	3	2	5	0.83
24	3	3	3	3	3	3	6	1.00
25	3	3	3	3	3	3	6	1.00
26	3	3	3	3	3	3	6	1.00
27	3	3	3	2	3	3	5	0.83
28	3	3	3	3	3	3	6	1.00
29	2	3	3	3	3	3	5	0.83
30	3	3	3	3	3	3	6	1.00
							S-CVI/Ave =	0.93

Note. This table presents the result of I-CVI and S-CVI/Ave of six experts' validity of course design.

3.5.5 Design of ESD course based on the PRME

This course was designed to develop sustainability learning outcomes of the international Chinese college students in the business programmes, which based on ESD learning outcomes and a three-phase model of the PRME principles proposed by de Paula Arruda Filho (2017). The aim of the ESD course was to provide a new definition of business to cultivate students a perspective of the relationship between business and sustainable development. The course content was shown in Table 3.7, which divided 15 classes into three-phase. The first phase was focused on building knowledge of PRME principles of purpose and value. Second was connected the SDGs and PRME principles of method and research. Third was target to the practical experience via the PRME principles of partnership and dialogue. The course syllabus and lesson plan of ESD was presented in Appendix VII.

Table 3.7

Design of ESD course based on a three-phase model of the PRME principles

Sections	Descriptions					
Phase	Phases I: Building knowledge		Phases II: Sustainable Development Goals (SDGs)		Phases III: Practical application	
Theme	Principle 1: Purpose	Principle 2: Value	Principle 3: Method	Principle 4: Research	Principle 5: Partnership	Principle 6: Dialogue
Period	2 classes with 3 hours each class	3 classes with 3 hours each class	2 classes with 3 hours each class	3 classes with 3 hours each class	3 classes with 3 hours each class	2 classes with 3 hours each class
Teaching methods	Active learning	Active learning; Case study	Active learning; Case study	Active learning; Problem-based learning	Problem-based learning; Case study	Active learning; Problem-based learning
Activities	• Word cloud • Experience sharing • Discussion board • Searching and sharing the information of ERS • Breakout rooms for group discussion	• Mind map • Breakout rooms for group discussion • Conclude and construct the notion of sustainable development from different theories • Group oral presentation	• Breakout rooms for group discussion • Searching the information of consumer green behaviour • Discussion board • Criticism and	• Word cloud • Searching information of the brand of social enterprises/ B corporation in China/ Thailand • Brainstorming • Short answer questions • Breakout rooms for	• Guest speaker • Experience report • Brainstorming • Breakout rooms for group discussion	• Project performance • Feedback of project performance

Sections	Descriptions					
		• Discussion board • Criticism and reflection to the brand management	reflection to the individual behaviour	group discussion		
Assessment	• Pre-test of questionnaire • Pre-test of the test of knowledge of sustainability • Short answer questions	• Short answer questions • Individual assignment • Group oral presentation	• Short answer questions	• Short answer questions	• Experience report	• Post-test of questionnaire • Post-test of the test of knowledge of sustainability • Group project performance

Note. This table demonstrates the design of ESD course, which divided 15 classes into three-phase: building knowledge, sustainable Development Goals (SDGs) and practical application. More information on the course design was presented in the course syllabus (Appendix VI)

3.6 Experiment

A quasi-experiment was conducted in the brand management course with one lecturer conducting the intervention and two classes participating in it. The intervention of the experimental design for the experimental and control groups is shown in Table 3.8. However, an active control group was also established in this study to achieve parallel variance motivation and determine expectations and the placebo effect for an improved evaluation (Chen et al., 2020; Zhang et al., 2019; Chen et al., 2017).

Table 3.8

Intervention of the experimental design for experimental and control groups

	Experimental group	Control group
Experimental intervention	PRME-based ESD course	Regular course
Teaching objectives	Cognitive, socio-emotional and behavioural learning outcomes of ESD	Without the learning outcomes of ESD
Teaching methods	Active learning, problem-based learning	Active learning, problem-based learning
Teaching materials	Self-compiled teaching materials	Self-compiled teaching materials
Lecturers' role	Lecturer acts as a facilitator to guide students in constructing the concept and increase their engagement in activities.	Lecturer acts as a facilitator to guide students in constructing the concept and increase their engagement in activities.
Students' role	Students construct concepts.	Students construct concepts.

Note. The table presents the intervention of the experimental design, which are PRME-based ESD course and ESD learning outcomes.

3.7 Measurement of pre-test and post-test

This study employed four instruments to measure the results before and after the experiment. All the pre-test was conducted before the research intervention and the post-test was progressed after the treatment. The first instrument is the questionnaire to examine the cognitive, socio-emotional and behavioural learning outcomes. Second is the test of knowledge of sustainability to investigate the cognitive learning outcomes. The design of the test was based on true-false and multiple-choice questions. The third is the project performance which evaluates via a rubric and focused on the socio-emotional and behavioural learning outcomes. Both control and experimental groups were required to take the above three instruments' pre-test and post-test. Finally, a semi-structured interview was conducted with 10 participants from the experimental group after the research intervention. The interview questions were divided into four categories: cognitive, socio-emotional, behavioural learning outcomes and employability.

3.7.1 Questionnaire to assess the sustainability learning outcomes

The primary goal of the survey was to assess the cognitive, socio-emotional and behavioural learning outcomes of the students in the brand management course. The advantage of a questionnaire-based survey is that it facilitates a direct examination of attitudes, values and motives (Robson & McCartan, 2016). The draft of the survey consisted of a total of 45 questions in four sections. The questionnaire was adapted from previous studies. Atmaca et al. (2019) developed a scale consisting of economic, social and environment dimensions to assess teacher candidates' awareness of sustainable development. Cifuentes-Faura et al. (2020) applied a survey to examine the knowledge, attitude and behaviour of sustainable development from a gender perspective, and da

Silva Junior et al. (2019) constructed statements related to the economic, socio-cultural and environmental aspects of the triple bottom line (TBL) to determine undergraduate students' attitude toward sustainability and corporate social responsibility. Furthermore, Hay and Eagle (2020) examined changes in undergraduate business students' attitudes, beliefs and perceptions of sustainability. They constructed a survey with the dimensions of current behaviour, knowledge, personal interests, unrealistic optimism and risk denial, perceived norms, responsibility for action, source of trustworthy information in respect of sustainability and climate change.

Michalos et al. (2012) used a survey to investigate 10th-grade students' knowledge, attitudes and behaviour toward sustainable development based on the concept of UNESCO. Meanwhile, PISA (2018) examined the competence of the young global generation, which consists of perspectives of others' world views, cultural issues, well-being and sustainable development, and Richmond and Baumgart (1981) used a national survey to analyse 5th-year secondary students' attitude toward the environment based on three factors: factual knowledge, conceptual knowledge and belief of environmental issues. Roberts and Bacon (1997) investigated the relationship between environmental concerns and ecologically-conscious consumer behaviour (ECCB) using the scale of the new environmental paradigm (NEP) and the results shed light on consumers' behaviour from a marketing perspective. Wang et al. (2020) examined the different perceptions of sustainable development of students in public and private universities. They developed a survey using the factors of students' commitment to sustainable development, knowledge of sustainability issues, attitude and sustainable practices.

The questions in the first section of the questionnaire in this study are related to students' demographic information, including their name, students' number, gender and grade. The questions in the second to fourth sections are related to cognitive, socio-emotional and behavioural learning outcomes respectively. The description of the construction of cognitive, socio-emotional and behavioural learning outcomes is presented in Table 3.9. There are 41 items in the survey, 8 of which are cognitive, 15 are socio-emotional and 18 are behavioural and a 5-point Likert scale is used from 1 = strongly disagree to 5 = strongly agree.

Table 3.9

Description of the construction of cognitive, socio-emotional and behavioural learning outcomes in the survey

Learning outcomes	Construct definition	Item	References
Cognitive (Co)	Learner knows about the strategies and practices of sustainable production and consumption.	CO19-1: Ecological footprint CO19-2: Consumer as a stakeholder CO19-3: Use of recycling material CO19-4: Use of packaging and disposable items	(Atmaca et al., 2019; da Silva Junior et al., 2019; Cifuentes-Faura et al., 2020).
	Learner understands the importance of global multi-stakeholder partnerships and shared accountability for sustainable development and knows examples of networks, institutions and campaigns of global partnerships.	CO22-1: Government's responsibility CO22-2: Government's role CO22-3: Mutually-beneficial business relationships CO22-4: Cooperative market relationships	(da Silva Junior et al., 2019; Hay & Eagle, 2020; Michalos et al., 2012).

Learning outcomes	Construct definition	Item	References
Socio-emotional (Se)	Learner understands how one's own consumption affects the working conditions of others in the global economy.	SE3-1: Understanding the effects of personal consumption SE3-2: Personal responsible consumption SE3-3: Personal responsible consumption SE3-4: Encouraging responsible consumption	(Cifuentes-Faura et al., 2020; Michalos et al., 2012; Roberts & Bacon, 1997; PISA, 2018).
	Learner can communicate the need for sustainable practices in production and consumption.	SE16-1: Communicating the consequences of economic practices on the environment SE16-2: Personal sustainable practice in consumption SE16-3: Sustainable production practices	(Hay & Eagle, 2020; PISA, 2018).
	Learner can differentiate needs from wants and can reflect on his/her own individual consumer behaviour in the light of the needs of the natural world, other people, cultures and countries and future generations.	SE18-1: Reflection on individuals' consumer behaviour SE18-2: Save future generation SE18-3: Thinking about other people SE18-4: Consumer behaviour	(Atmaca et al., 2019; Hay & Eagle, 2020; PISA, 2018).
	Learner feels responsible for the environmental and social impacts of his/her own individual behaviour as a producer or consumer.	SE20-1: Awareness of the effect of individual consumers' behaviour on the environment and society SE20-2: Awareness of the effect of individual consumers' behaviour on sustainability SE20-3: The practice of individuals' behaviour of responsible consumption. SE20-4: Awareness of individuals' responsible behaviour	(Atmaca et al., 2019; Hay & Eagle, 2020; PISA, 2018; Roberts & Bacon, 1997).

Learning outcomes	Construct definition	Item	References
Behavioural (Be)	Learner can engage with new visions and models of a sustainable, inclusive economy and decent work.	BE1-1: Decent work BE1-2: Decent work BE1-3: Inclusive economy BE1-4: Inclusive economy	(da Silva Junior et al., 2019; Michalos et al., 2012; PISA, 2018).
	Learner can innovate and develop sustainable enterprises to respond to the industrial needs of his/her country.	BE8-1: Economic investment BE8-2: Innovate high-tech products BE8-3: Support research and development	(Atmaca et al., 2019)
	Learner can become an agent of change to achieve the SDGs and play the role of an active, critical, global sustainability citizen.	BE21-1: Individual role of citizens BE21-2: Need of citizenship for sustainability BE21-3: Helping others. BE21-4: Change agent for equal opportunities in society	(Atmaca et al., 2019; Cifuentes-Faura et al., 2020; Michalos et al., 2012)
	Learner can support development cooperation activities.	BE24-1: Supporting environmental protection BE24-2: Organisational activities for sustainability BE24-3: Supporting policies for environmental activities BE24-4: Supporting the university's initiatives	(Atmaca et al., 2019; Richmond and Baumgart, 1981; da Silva Junior et al., 2019; Wang et al., 2020)
	Learner can influence companies to become part of a global partnership for sustainable development.	BE25-1: Influencing companies to develop a sustainable culture	(da Silva Junior et al., 2019)

Note. This table demonstrates the construction of the questionnaire to examine the sustainability learning outcomes and its items references.

Fowler Jr. (2013) suggests that the validity of a survey can be ensured by the application of a back translation to translate the original version into a new language. The original survey in this study was in English and needed to be translated into Chinese. Therefore, the new Chinese version was sent to a different translator with a Master's degree in English to be back translated and to reconcile the differences between both versions.

3.7.2 Test of Knowledge of sustainability

The aim of this test is to evaluate students' cognitive learning outcomes by applying a two-dimensional taxonomy framework to structure the questions. Anderson and Krathwohl (2001) revised Bloom's Taxonomy and proposed a two-dimensional taxonomy framework to enhance the understanding of students' level of learning. The first dimension is the cognitive process, which consists of remembering, understanding, applying, analysing, evaluating and creating, with creating being the most complex part of the process. The second dimension is knowledge, which contains factual, conceptual, procedural and metacognitive aspects. Therefore, the knowledge dimension consists of concrete knowledge of facts and abstract knowledge based on metacognition (Anderson & Krathwohl, 2001).

The design of the test in this research involved constructing the questions based on two cognitive learning outcomes. The design of the test in this research involved constructing the questions based on two cognitive learning outcomes. The first learning outcome is about the strategies and practices of sustainable production and consumption. The design of the questions focuses on the relationship between sustainability and brand management, which included the basic concept of

sustainability to the strategy implementation of production and management. In addition, the consumer green purchasing behaviour is also a point for the question design. The second learning outcome focuses on the importance of partnerships and institutions for SD. The questions' design is about the networks of sustainable brands and the business model towards sustainability. The test was composed of 39 questions to examine the students' learning outcomes. At least 4 questions were related to each knowledge dimension and at least 2 to each dimension of the cognitive process.

Table 3.10

Two-way specification table for the test on cognitive learning outcomes

Cognitive learning outcomes	Knowledge dimension	Cognitive process dimension						Total number of questions
		1. Remember	2. Understand	3. Apply	4. Analyse	5. Evaluate	6. Create	
The learner knows about the strategies and practices of sustainable production and consumption.	Factual	4	2		1			7
	Conceptual		4					4
	Procedural	1		2		2		5
	Meta-Cognitive			1	2		1	4
The learner understanddds the importantce of global multi-stakeholder partnersh and the	Factual	4	2					6
	Conceptual		3				1	4
	Procedural				2	2		4

Cognitive learning outcomes	Knowledge dimension	Cognitive process dimension						Total number of questions
		1. Remember	2. Understand	3. Apply	4. Analyse	5. Evaluate	6. Create	
shared accountability for sustainable development and knows examples of networks, institutions, campaigns of global partnerships	Meta-Cognitive			1	1	3		5
Total number of questions		9	11	4	6	7	2	39

Note. This table demonstrates the total number of 39 questions in the test on cognitive learning outcomes by the two-way specification table.

3.7.3 Rubric for evaluation project performance

A rubric was applied to comprehensively analyse the students' socio-emotional and behavioural learning outcomes in their project performance. A rubric is an assessment tool that can be used to judge students' project performance consistently and accurately with complete objectivity and to examine their constructed responses and learning outcomes efficiently (Pellegrino et al., 1999). It enables instructors to collect observable and measurable data in relation to students' learning outcomes by grading their performance (Malini Reddy, 2012). Therefore, a rubric was utilised to evaluate the students' learning outcomes after the intervention of different course content in response to the research questions (Table 3.11).

Table 3.11

Rubrics used to evaluate the students' project performance

Criteria	High (7-10)	Intermediate (4-7)	Low (0-4)
Content (30%)	The information is complete and well-supported in detail. The knowledge acquisition that occurs when hearing the presentation is significant.	The information is complete, with a detailed support base. The knowledge acquisition of the audience increases in some aspects.	Lacks important information. There are no details that help understanding.
Organisation, development and vocabulary (40%)	The introduction indicates the targets and capture the attention. The development is organised and has detailed support. The conclusions indicate in detail the most important points. The vocabulary is rich.	The introduction indicates the objectives but does not capture the audience's attention. The development is organised and has some support. The conclusions indicate basically the most important points. The vocabulary is appropriate, with some slips.	There is no introduction, or the provided introduction it is unclear. The development is confusing and has no support tools. No final conclusions are given, or they are not clear. The technical vocabulary is limited.
Visual aids to the presentation (30%)	Clearly help the presentation and increase the ease of understanding.	Appropriate for the subject, but the integration is not optimal.	Do not help the audience. They are confusing.

Note. Adapted from Martínez, F., Herrero, L. C., & De Pablo, S. (2010). Project-based learning and rubrics in the teaching of power supplies and photovoltaic electricity. *IEEE Transactions on Education*, *54*(1), 87-96. https://doi.org/10.1109/TE.2010.2044506

3.7.4 Expert review of project performance

Ten internal experts were invited to evaluate the project performance, with five experts each in the pre-test and post-test. These ten internal experts had at least 2 years of experience in teaching sustainability management or management field. An online expert's meeting was held via Zoom to ensure that the experts can understand the research questions and the required content of the project. The primary required content was to develop a social purpose to connect with SDGs to achieve sustainability. Each expert was given standardised evaluation worksheets after the expert's meeting and independently evaluated the project performance.

3.7.5 Interview

The exploratory characteristic of interviews enables various angles and a greater depth knowledge to be explored in an effort to answer the research questions (Mason, 2017). In a mixed method approach, interviews can be well used with other methods to collect the data for a better understanding of people's perspective after an interactive experience (Mason, 2017; McIntosh & Morse, 2015). Interviews can be categorised as different types based on their level of flexibility (Robson & McCartan, 2016). There are three main types of interviews: fully structured, semi-structured and unstructured. Semi-structured interviews are the most suitable type to apply in a research design in which the researcher plays a dual role as the interviewer (Robson & McCartan, 2016). The process of a semi-structured interview is guided by open-ended questions based on a list of topics (McIntosh & Morse, 2015). The order of the questions can follow the participant's response and unplanned questions can be added according to the information that participants provide (Robson & McCartan, 2016). This is an advantage for the interviewer to better guide participants around the key questions,

while simultaneously giving them flexible opportunities to explain their opinions. Meanwhile, the open-ended questions of the interview can be the triangulated to examine the results of a quantitative questionnaire (McIntosh & Morse, 2015). Therefore, semi-structured interviews were used in this study to explore the experimental groups' perspective after the experimental intervention and the post-test of test of knowledge of sustainability, the questionnaire and the project performance. These interviews were semi-structured and conducted by telephone on a one-to-one basis. Since telephone interviews can reduce the bias in responses caused by the interviewer's characteristics and the need for substantial travel (Gwartney, 2007), they were an effective way to collect the data during the COVID-19 pandemic.

Since the purpose of this interview was to explore the perspective of the experimental intervention of the participants in the experimental group, the sample consisted of all the members of that group. According to Hennink and Kaiser (2021), the data collected from an empirical test in qualitative research can be saturated by a sample size within the range of 9-17 interviewees. The sample size in this study was 10 interviewees in order to collect rich data. Convenience sampling was used to select the sample until the quotient was full (Robinson, 2014). The participants were all informed of the reason for the interview by the DingTalk voice call. They were advised that their participation was purely voluntary, and they were free to refuse to answer any questions that made them feel uncomfortable. They were also assured of their complete anonymity and that their privacy would be respected. In addition, they were given the researcher's contact details to verify their willingness to participate in the study. The interviews were conducted after the experimental intervention and the post-test in

December 2021 and processed in the Chinese language by DingTalk voice call. Each interview lasted for around 15-30 minutes.

The interview schedule was designed based on the domain of the research question, which is how does an ESD course intervention develop international Chinese college students' sustainability? The domain of sustainability learning outcomes was sub-divided into four categories of cognitive, socio-emotional, behavioural learning outcomes and employability. The learning outcomes categories were set according to the literature of SDGs learning objectives education (Rieckmann, 2017). In terms of the employability category, it was found from the literature review that business sustainability practices are essential skills for today's business graduates (Chen et al., 2018). The scheduled interview questions were based on the questionnaire. There were 12 open-ended questions including 3 related to cognition, 4 related to socio-emotion, 3 related to behavioural learning outcomes and 2 related to employability. The outline of the interview schedule is presented in the Appendix VIII.

3.8 Data Collection

The data collection process was divided into three stages, the first of which involved collecting context data from websites to investigate the development of the ESD curriculum. In the second stage, a pilot test was implemented to examine the data collection tools of the survey and the test. According to Hazzi and Maldaon (2015), a pilot study helps to examine the efficiency of the data collection instrument. The third stage consisted of the experimental intervention conducted with the experimental group and a control group and the collection of the survey responses and learning outcome data from the test of knowledge of sustainability and the rubric for evaluation project

performance. There were ten internal experts had invited to evaluate the project performance by rubric, with five experts each in the pre-test and post-test.

3.9 Data Analysis

In terms of the three stages of data collection, a web-based content analysis was firstly applied to examine the website context in each sample by reviewing the inclusion of students' learning outcomes and examining the consistency of the strategic maps with the ESD learning outcome instruction of UNESCO. Moreover, five experts participated in the data analysis to construct the validity of the mapping. Secondly, an item analysis was used to examine the data of the survey pilot test by applying the difficulty index, discrimination index and distraction. Thirdly, the intervention study data was subjected to a descriptive analysis to compare the mean of the pre-test and post-test of the experimental and control groups. A one-way ANCOVA was conducted to evaluate the statistically-significant differences between the two groups in the post-test controlling for the pre-test.

Besides, the qualitative data of the interview was transcribed from the DingTalk voice recording files. All the transcriptions were numbered in line with the participant number. The thematic analysis was applied to explore the participants' perspectives and derive from the observational technique of the constant comparison method (Bernard et al., 2016). Furthermore, coding method of pawing was conduced for developing the themes (Ryan& Bernard, 2003). The coding processes of pawing included: eyeballing the texts, sorting the texts and using color highlighters to mark the different margins indicating meaning and coding. In terms of reliability, the transcripts of the interview were read more than twice by the researcher on different occasions to

ensure the consistency of the sorting of the texts assigned to the same category (Hammersley, 1992).

3.10 Role of Researcher

The role of the researcher in this study is a teacher-researcher. Bissex (1986) indicates that the role of a teacher-researcher enables the researcher to observe, question and provide a realistic view of the status of a teacher. Teacher-researchers discover the research questions during their teaching process and unfold their study in the class (Mohr, 1994). They formulate the teaching process using a scientific inquiry approach to hypothesise their research questions and systematically guide the class (Santa & Santa, 1995). In investigating the research question, teacher-researchers collect the data in their class via observation and listening to participants' responses to further examine their performance to contribute to the knowledge of education (Mohr, 1994; Santa & Santa, 1995). The position of teacher-researcher in educational research is as a critical participant investigating theoretical ideas from a practitioner perspective (Hammersley, 1993). In this study, the empirical research involves teaching ESD to university students in a business programme in Thailand to examine the influence of the learning outcomes. Therefore, the role of teacher-researcher was applied to the researcher to investigate the holistic interactions in this empirical research.

3.11 Pilot study

The aim of the pilot study was to determine the viability of the questionnaire to measure sustainable learning outcomes and the test for the students' knowledge of sustainability. According to Van Teijlingen and Hundley (2001), a pilot study involves the pre-testing of the measurement instrument in the research, which is an essential

component of the research design. A pilot study is undertaken to determine if the measuring instrument is appropriate and sufficiently valid to be used to collect data in response to the research questions from the target participants (Hassan et al., 2006; Secomb & Smith, 2011). Therefore, a pilot study was undertaken in a private university in Bangkok, Thailand, in order to test the measurement instruments and determine their viability for use in the main study. The participants were 20- to 21-year-old students who had completed the brand management course in the business school. This was the experimental course of the course design of ESD based on the PRME in the main study.

3.11.1 Analysis of questionnaire of sustainable learning outcome

IBM SPSS Statistics 22 was used as the analytical software to evaluate the items of the survey in this pilot study. Chiou (2009) explains that an item analysis is an effective method of evaluating a pilot study survey due to its aim of deleting improper items to enhance the validity of the survey. The items included in an item analysis are descriptive statistics, criteria of internal consistency, a reliability analysis and a factor analysis. 154 of the 165 surveys issued as samples of the pilot study were deemed to be valid; hence, the valid recovery rate was 93.3%. A summary of the item analysis results can be seen in Appendix IX.

A. Descriptive Statistics

The mean value of a question reflects its degree of difficulty; hence, it is essential to establish the mean value to reflect the question’s central tendency (Chiou, 2009). The mean value of a question can be a 1.5 positive or negative standard deviation of the mean value of the entire questionnaire (Chiou, 2009). In this study, the mean value of the entire questionnaire was found to be 4.33 and the standard deviation was

0.24. Hence, question items with a mean value below 3.97 or above 4.69 were targets for deletion. According to the results of the item analysis, questions 1, 9 and 14 should be deleted because their mean value was below 3.97 (Q1 = 3.81; Q9 = 3.54; Q14 = 3.96).

When the standard deviation of the scores of a question is below 0.75, it is considered to have a low degree of discrimination (Chiou, 2009). Since the standard deviation of questions 5, 6, 7, 17, 28, 29, 30, 32, 33 and 35 to 41 was below 0.75, these questions could be deleted.

B. Criterion of Internal Consistency

Kelley (1939) indicates that the reliability of the examination questions to discriminate can be tested when the upper and lower 27% of the total scores of a survey are used to group the samples. Therefore, 27% of the highest and lowest scores of the entire survey in this study were used as extreme groups for testing. The results showed that the *t*-value of Q1 to Q41 was significant; therefore, 41 questions of the pilot study survey had the ability to discriminate.

C. Reliability Analysis

The total reliability coefficient of the pilot study survey was 0.956, which is good because the closer the reliability coefficient is to 1, the greater is the reliability (Cronbach, 1990). In the relevant fields of the total number of corrected items in Appendix IX, the correlation coefficient of Q9 is 0.25, which is below 0.3. Therefore, this question can be deleted.

D. Summary of Item Analysis

In an item analysis, the decision of whether or not a survey item should be deleted is subject to an overall analysis based on the preceding indicators (Chiou, 2009). According to Appendix IX, Q9 had three indicators that were less than satisfactory, including correlation coefficient (Q9 = 0.25 < 0.3) and factor load (Q9 = 0.23 < 0.45). Therefore, this question was deleted. Q1 had two indicators that were less than satisfactory: mean value (Q1 = 3.81 < 3.97) and factor loadings (Q1 = 0.346 < 0.45). However, its correlation coefficient was 0.362 (>0.3), which remains consistent, and its *t*-value was significant ($t = -6.085$, $p<0.05$). Therefore, this question was retained. Although other questions had one indicator that was less than satisfactory, their correlation coefficient and factor loadings reached the standard for measurement. Therefore, they were retained. As a result of the item analysis, Q9 was deleted and 40 questions were retained for the formal survey examination. Appendix X and XI presented the formal survey in English and Chinese version respectively.

E. Factor Analysis

A principal-axis factor analysis was used to measure the factor loadings in this study. According to Chiou (2009), this kind of analysis is ideal for measuring the factor loadings of a survey compilation and Hair et al. (2010) note that the value of identifying factor loadings when the number of samples is 150 is 0.45. Since the number of pilot study samples in this study is 154, 0.45 is used as the standard for evaluation. According to Appendix IX, the factor loadings of Q1 and Q9 were below 0.45 (Q1 = 0.346; Q9 = 0.23). Therefore, these questions can be deleted.

3.11.2 Analysis of the test for knowledge of sustainability

A total of 40 samples of the pilot study were issued for the test, including 40 valid samples, giving valid recovery rate of 100%. The test consisted of 39 questions: 6 true-false questions and 33 multiple-choice questions (with 4 choices). Tester for Windows 3.0 was utilised as the analytical software in this study to evaluate the items' discrimination and difficulty. Tester for Windows could make a statistical analysis of the students' answers and be effectively used to evaluate the results of the assessment test (Yu, 2011).

A. Reliability Analysis

Cronbach's alpha was utilised to measure the internal consistency reliability coefficient of the test of the pilot study. Carmines and Zeller (1979) suggest that the measure of educational research using a reliability coefficient of 0.8 is considered to be highly reliable. The values of the Cronbach's alpha of the pilot study test are shown in Table 3.12. The value of all the questions was larger than 0.8 and the Cronbach's alpha of the whole test was 0.829, representing highly reliable results.

B. Item discrimination

Item discrimination indicates the ability of examination questions to divide students into groups of high and low scorers (Gajjar et al., 2014). The discrimination index ranges from -1.00 to 1.00 (Yu, 2011). Noll et al. (1979) claim that items with a discrimination value of above 0.25 are acceptable and those with a discrimination value of less than zero should be removed from the test (Yu, 2011). As can be seen in Table 3.12, the values of item discrimination of Q2, Q23, Q26, Q29 and Q35 were below 0.25 (Q2 = 0.06, Q23 = 0.14, Q26 = 0.10, Q29 = 0.13 and Q35 = 0.20); therefore, these

questions should be revised or deleted. Since Q1 and Q4 also had discrimination values of less than zero (Q1 = -0.22; Q4 = -0.09), they should be deleted from the test.

C. Item difficulty

Item difficulty refers to the percentage of examinees who answered the item correctly (Thorndike & Thorndike-Christ, 2009). The range of indices of item difficulty is from 0.00 to 1.00 (Yu, 2011). Chase (1978) proposes that the range of value of the difficulty index criteria when selecting true-false items is 0.55 to 0.85 and 0.40 to 0.80 for multiple-choice items. According to the analysis of the item difficulty indices, the value of multiple-choice Q4, Q10, Q13, Q15, Q26, Q29, Q34, Q35 and Q38 was lower than 0.40 (Q4 = 0.05, Q10 = 0.39, Q13 = 0.35, Q15 = 0.30, Q26 = 0.05, Q29 = 0.34, Q34 = 0.30, Q35 = 0.30 and Q38 = 0.35). Moreover, Q12 and Q27 had higher values than 0.80 (Q12 = 0.82; Q27 = 0.82) (see Table 3.12). Therefore, all these questions should be revised or accepted in the test. The questions that fail to reach the criteria of the item difficulty should be revised or accepted based on the objective of the test (Yu, 2011).

D. Summary of item discrimination and difficulty analysis

In the analysis of item discrimination and difficulty, the questions that have less than the discrimination criteria should be deleted from the test, such as Q1, Q2, Q4, Q23, Q26, Q29 and Q35 in this study (Table. 3.12). Moreover, questions that have less than the criteria of item difficulty, but reach the criteria of item discrimination, should be accepted for the test due to the design of a two-way specification table of the learning outcomes. Yu (2011) affirms that the design of a two-way specification table and the objective of the test should also be considered in order to select questions with valid content. Although Q10, Q12, Q13, Q15 and Q34 in this study had less than the criteria

of difficulty, the item discrimination was above 0.25 (Q10 = 0.42, Q12 = 0.36, Q13 = 0.51, Q15 = 0.60 and Q34 = 0.41), which is acceptable for the test. Hence, the test in the main study was based on 32 questions, built by four knowledge dimensions: factual, conceptual, procedural, and meta-cognitive. The two-way specification table of the test in the main study was shown in Appendix XII. The factual knowledge dimension was with 9 questions which contained 1 true-false question and 8 multiple-choice questions. In terms of the conceptual knowledge dimension, 7 questions included 2 true-false questions and 5 multiple-choice questions. The knowledge dimensions of procedural were with 9 questions and meta-cognitive with 7 questions. Both dimensions were constructed by multiple-choice questions. The test's total score is 32, and each question is taken on 1 point. Appendix XIII and XIV presented the 32 questions in English and Chinese version respectively.

Table 3.12

Summary of the test analysis results

Questions	Question types	Cronbach's alpha	Discrimination	Difficulty	Decisions
1	True-False	0.84	-0.22	0.71	Delete
2	True-False	0.84	0.06	0.67	Delete
3	True-False	0.82	0.52	0.44	Accept
4	True-False	0.83	-0.09	0.05	Delete
5	Multiple-choice	0.82	0.54	0.63	Accept
6	Multiple-choice	0.82	0.72	0.54	Accept
7	Multiple-choice	0.83	0.35	0.72	Accept
8	Multiple-choice	0.82	0.44	0.58	Accept

Questions	Question types	Cronbach's alpha	Discrimination	Difficulty	Decisions
9	Multiple-choice	0.82	0.82	0.59	Accept
10	Multiple-choice	0.82	0.42	0.39	Accept
11	Multiple-choice	0.81	0.81	0.50	Accept
12	Multiple-choice	0.82	0.36	0.82	Accept
13	Multiple-choice	0.82	0.51	0.35	Accept
14	Multiple-choice	0.83	0.26	0.77	Accept
15	Multiple-choice	0.82	0.60	0.30	Accept
16	Multiple-choice	0.82	0.61	0.40	Accept
17	Multiple-choice	0.82	0.45	0.68	Accept
18	Multiple-choice	0.82	0.54	0.63	Accept
19	Multiple-choice	0.83	0.44	0.58	Accept
20	Multiple-choice	0.83	0.35	0.72	Accept
21	True-False	0.83	0.35	0.72	Accept
22	Multiple-choice	0.83	0.33	0.44	Accept
23	Multiple-choice	0.84	0.14	0.43	Delete
24	Multiple-choice	0.83	0.35	0.63	Accept
25	Multiple-choice	0.83	0.45	0.68	Accept
26	Multiple-choice	0.83	0.10	0.05	Delete
27	Multiple-choice	0.83	0.36	0.82	Accept
28	Multiple-choice	0.83	0.34	0.53	Accept
29	Multiple-choice	0.83	0.13	0.34	Delete
30	Multiple-choice	0.83	0.33	0.44	Accept

Questions	Question types	Cronbach's alpha	Discrimination	Difficulty	Decisions
31	Multiple-choice	0.83	0.43	0.49	Accept
32	Multiple-choice	0.82	0.43	0.49	Accept
33	Multiple-choice	0.82	0.73	0.64	Accept
34	Multiple-choice	0.82	0.41	0.30	Accept
35	Multiple-choice	0.83	0.20	0.10	Delete
36	True-False	0.83	0.35	0.63	Accept
37	Multiple-choice	0.82	0.61	0.40	Accept
38	Multiple-choice	0.82	0.70	0.35	Accept
39	Multiple-choice	0.82	0.91	0.55	Accept

Note. This table presents the pilot result of the test for knowledge of sustainability, and the accepted questions will apply in the main study.

3.12 Summary

The purpose of this chapter was to describe the research methods that were utilised to respond to the research questions in a discussion of the research procedure, participants, experiments and measurement instruments implemented in the study. A web-based content analysis was used to develop the course design of ESD based on the PRME in a university business programme. A pilot study was conducted to ensure the validity and reliability of the measurement instruments. The results of this experimental research will be reported in the next chapter.

CHAPTER 4

RESULTS OF STUDY

The results of the study are presented in this chapter based on an experiment, which was conducted in a private university in Bangkok, Thailand, over a period of two months from the middle of October 2021 to the beginning of December 2021. The aims of the experiment were a) to examine the effect of the ESD course on the sustainable development of international Chinese college students, and b) to determine if international Chinese college students' sustainable learning outcomes were enhanced by the ESD intervention compared to the sustainable learning outcomes of those students on the regular college business course. The pre-and post-test results were measured by a questionnaire, a test of the knowledge of sustainability and the project performance. Additionally, a semi-structured interview was conducted with 10 participants from the experimental group after the research intervention. The results of the statistical analysis of the data collected by the above instruments are presented below.

4.1 Descriptive analysis of the participants

A descriptive analysis was used to explore the participants' background information with a particular focus on investigating gender differences. All 96 students of the international business programme in the Experimental Group (EG) and the Control Group (CG) undertook a pre-and post-test. The background information of all the participants is shown in Table 4.1. There were 46 valid respondents in the EG, 35 of whom were male and 11 were female. In terms of the CG, there were 50 valid respondents, 30 of whom were male and 20 were female. They were all junior students who were studying the same curriculum in the international business programme.

Table 4.1

Descriptive analysis of the participants

Groups	Items	Item distinction	N	Valid percentage
EG	Gender	Male	35	76.1 %
		Female	11	23.9 %
CG	Gender	Male	30	60.0 %
		Female	20	40.0 %

Note. EG = Experimental Group; CG = Control Group.

In terms of gender difference, the results of the independent sample t-test showed that there was no homogeneous distribution in the participants' gender (F = 4.36, p = .039 < .05). However, there was also no significant difference (t = -1.711, p = .092 > .05) when comparing the genders in both the EG and the CG, which indicated

that the intervention of the ESD course had not had a different effect on both genders in the EG and CG.

4.2 Independent sample t-test of pre-test

The participants in this study were those who had enrolled in the brand management course. Therefore, random allocation could not be used to assign them to EG or CG. Hence, to ensure the equivalence between the EG and CG, an independent sample t-test was applied to determine if there was a difference between the EG and CG before the experimental intervention. The pre-test data was analysed via an independent sample t-test to assess the cognitive (Co), socio-emotional (Se) and behavioural (Be) sustainable learning outcomes in both the EG and CG.

4.2.1 Analysis of questionnaire in pre-test

The mean and standard deviations of the EG and CG are shown in Table 4.2, and the analytical results of the independent sample t-test are shown in Table 4.3. These two analytical results were discussed into three variables: cognitive, socio-emotional and behavioural sustainable learning outcomes. In the cognitive variable, EG (M = 4.1, SD = 0.6) and CG (M = 4.1, SD = 0.4) had a non-homogeneous distribution (F = 9.70, p = .002) and the same starting point (t = −0.16, p = .871). In the socio-emotional variable, EG (M = 3.9, SD = 0.6) and CG (M = 4.0, SD = 0.6) also had a homogeneous distribution (F = 0.17, p = .679) and the same starting level (t = -0.99, p = .322). In the behavioural variable, EG (M = 4.2, SD = 0.6) and CG (M = 4.2, SD = 0.5) also had a homogeneous distribution (F = 0.90, p = .343) and the same starting level (t = -0.03, p = .972).

The questionnaire examined students' cognitive, socio-emotional and behavioural learning outcomes. Although the results of the cognitive pre-test of the EG and CG presented a non-homogeneous distribution, there were no significant difference before the experimental intervention were observed in cognitive, socio-emotional and behavioural learning outcomes.

Table 4.2

Descriptive analysis of questionnaire in pre-test

		EG (n = 46)		CG (n = 50)	
Variables	Tests	Mean	*SD*	Mean	*SD*
Cognitive	Pre-test	4.1	0.6	4.1	0.4
Socio-emotional	Pre-test	3.9	0.6	4.0	0.6
Behavioural	Pre-test	4.2	0.6	4.2	0.5

Note. EG = Experimental Group; CG = Control Group.

Table 4.3

Summary of independent sample t-test of questionnaire in pre-test

Variables	*p*	*t*	*p*
Cognitive	.002	-0.16	.871
Socio-emotional	.679	-0.99	.322
Behavioural	.343	-0.03	.972

Note. N= 96.

4.2.2 Analysis of the test of knowledge of sustainability in pre-test

The mean and standard deviations of the EG and CG are shown in Table 4.4, and the analytical results of the independent sample t-test are shown in Table 4.5. These two analytical results were divided into four aspects of knowledge: factual, conceptual, procedural and meta-cognitive. In the factual knowledge dimension, EG (M = 3.5, SD = 1.2) and CG (M = 3.2, SD = 1.4) had a homogeneous distribution (F = 2.28, p = .134) and the same starting point (t = −1.18, p = .241). In the conceptual knowledge dimension, EG (M = 2.6, SD = 1.2) and CG (M = 2.7, SD = 1.2) also had a homogeneous distribution (F = 0.10, p = .750) and the same starting point (t = 0.26, p = .793). In the procedural knowledge dimension, EG (M = 2.4, SD = 1.3) and CG (M = 2.5, SD = 1.4) also had a homogeneous distribution (F = 1.11, p = .295) and the same starting level (t = 0.30, p = .765). Finally, in the meta-cognitive knowledge dimension, EG (M = 2.8, SD = 1.2) and CG (M = 2.6, SD = 1.3) also had a homogeneous distribution (F = 0.10, p = .745) and the same starting point (t = −0.85, p = .397).

Table 4.4

Descriptive analysis of knowledge of sustainability in pre-test

		EG (n = 46)		CG (n = 50)	
Knowledge dimensions	Tests	Mean	*SD*	Mean	*SD*
Factual	Pre-test	3.5	1.2	3.2	1.4
Conceptual	Pre-test	2.6	1.2	2.7	1.2
Procedural	Pre-test	2.4	1.3	2.5	1.4
Meta cognitive	Pre-test	2.8	**1**.2	2.6	1.3

Note. EG = Experimental Group; CG = Control Group.

The knowledge of sustainability tests was focused on evaluating the students' cognitive learning outcomes. The above results show that the pre-tests of the EG and CG had the same configuration, and there was no significant difference before the experimental intervention was observed in terms of cognitive learning outcomes.

Table 4.5

Summary of independent sample t-test of knowledge of sustainability in pre-test

Knowledge dimensions	*p*	*t*	*p*
Factual	.134	-1.18	.241
Conceptual	.750	0.26	.793
Procedural	.295	0.30	.765
Meta-cognitive	.745	-0.85	.397

Note. N= 96.

4.2.3 Analysis of project performance in pre-test

The results of the homogeny between the EG and CG in terms of project performance in the pre-test can be seen from Tables 4.6 and 4.7. The distribution between EG (M = 24.2, SD = 2.3) and CG (M = 24.4, SD = 1.7) was homogeneous (F = 1.21, p = .291). Moreover, there was no significant difference (t = −0.19, p = .852) between the two groups.

Table 4.6

Descriptive analysis for the test of project performance in pre-test

		EG (n = 46)		CG (n = 50)	
Variable	Tests	Mean	*SD*	Mean	*SD*
Project performance	Pre-test	24.2	2.3	24.4	1.7

Note. EG = Experimental Group; CG = Control Group.

Table 4.7

Summary of independent sample t-test for the test of project performance on pre-test

Variable	*p*	*t*	*p*
Project performance	.291	-.19	.852

Note. N= 96.

The project performance was focused on analysing the students' socio-emotional and behavioural learning outcomes. The above results indicate that there was no significant difference in the socio-emotional and behavioural learning outcomes of the EG and CG, which meets the requirement of homogeneity in the pre-test.

4.3 Paired-sample t-test

A paired-sample t-test was used to assess whether there was a statistically significant difference in the growth of sustainability learning outcomes before and after the intervention of the ESD course. Both the EG and CG were investigated to compare the results of the pre- and post-tests.

4.3.1 Analysis of paired-sample t-test for the questionnaire

The results of the paired-sample-test of the EG are shown in Table 4.8 and those of the CG in Table 4.9. In terms of EG test, the mean and SD of the cognitive variable had increased compared with the pre-test (M = 4.1, SD = 0.6) and post-test (M = 4.6, SD = 0.3) and had significantly increased (t = −4.96, p =. 000). Moreover, the pre- and post-test were irrelevant (r = .17, p = .238), indicating that the post-test was not affected by the pre-test. In the socio-emotional variable, the mean and SD had increased compared to the pre-test score (M = 3.9, SD = 0.6) and post-test (M = 4.4, SD = 0.4) and had a significantly advanced (t = −5.04, p =. 000). Meanwhile, the pre- and post-test were relevant (r = .31, p = .035), which shows that the post-test scores were affected by the pre-test. Finally, the mean and SD of the behavioural variable had also increased, compared to the pre-test (M = 4.2, SD = 0.6) and post-test (M = 4.6, SD = 0.3) and had significantly advanced (t = −3.98, p =. 000). In addition, the pre- and post-test scores were relevant (r = .31, p = .032), which shows that the post-test scores were affected by the pre-test.

Table 4.8

Summary of paired-sample t-test of EG for questionnaire

Variables	Group	*Mean (SD)*		*df*	*t*	*p*	*r*
		Pre-test	Post-test				
Cognitive	EG	4.1 (0.6)	4.6 (0.3)	45	-4.96	.000	.17
Socio-emotional		3.9 (0.6)	4.4 (0.4)	45	-5.04	.000	.31
Behavioural		4.2 (0.6)	4.6 (0.3)	45	-3.98	.000	.31

Note. n= 46. EG = Experimental Group.

Regarding to the CG, the results of the paired-sample t-test are presented in Table 4.9. The cognitive variable showed that there was a slight improvement compared to the pre-test (M = 4.1, SD = 0.4) and post-test (M = 4.2, SD = 0.5), but the growth effect had made no significant progress (t = −1.93, p = .059). Meanwhile, the questionnaire of the cognitive dimension before and after the investigation showed a significant relevance (r = .56, p = .000), which indicated that the post-test score was affected by the pre-test. In terms of the socio-emotional variable, although the mean and SD had increased a little compared to the pre-test (M = 4.0, SD = 0.6) and post-test (M = 4.1, SD = 0.5), the result showed a significant growth effect (t = -2.37, p = .021). Meanwhile, the pre- and post-test scores were relevant (r = .76, p = .000), which shows that the post-test scores were affected by the pre-test. Finally, in the behavioural variable, the mean and SD had an increase compared to the pre-test (M = 4.2, SD = 0.5) and post-test (M = 4.4, SD = 0.6), and had a significantly improved (t = −2.05, p = .045). In addition, the pre- and post-test scores were also presented a relevance (r = .56, p = .000), which shows that the post-test scores were affected by the pre-test.

Table 4.9

Summary of paired-sample t-test of CG for questionnaire

Variables	Group	*Mean (SD)*		*df*	*t*	*p*	*r*
		Pre-test	Post-test				
Cognitive		4.1 (0.4)	4.2 (0.5)	49	-1.93	.059	.56
Socio-emotional	CG	4.0 (0.6)	4.1 (0.5)	49	-2.37	.021	.76
Behavioural		4.2 (0.5)	4.4 (0.6)	49	-2.05	.045	.56

Note. n= 50. CG = Control Group.

The above results of the questionnaire indicated that EG showed significant progress in all three variables after the experimental intervention. Notably, the post-test of socio-emotional and behavioural variables were influenced by the pre-test. In terms of CG, there had a significant growth effect in socio-emotional and behavioural variables. Furthermore, the post-test of all three variables were affected by the pre-test.

4.3.2 Analysis of paired-sample t-test for the test of knowledge of sustainability

The results of the paired-sample-test of the EG are shown in Table 4.10 and those of the CG in Table 4.11. In terms of the growth effect of the EG test, the mean and SD of the factual knowledge dimension had increased compared with the pre-test (M = 3.5, SD = 1.2) and post-test (M = 5.7, SD = 2.1) and had significantly advanced (t = −6.32, p =. 000). Meanwhile, the pre- and post-test were irrelevant (r = .12, p = .416), indicating that the post-test was not affected by the pre-test. In the conceptual knowledge dimension, the mean and SD had increased compared to the pre-test score (M = 2.6, SD = 1.2) and post-test (M = 4.1, SD = 1.4) and had a significantly advanced (t = −5.86, p =. 000). Furthermore, the pre- and post-test were irrelevant (r = .15, p

= .307), which shows that the post-test scores were not affected by the pre-test. In the procedural knowledge dimension, the mean and SD had increased, in contrast with the pre-test (*M* = 2.4, *SD* = 1.3) and post-test (*M* = 4.0, *SD* = 1.6) and had a significant growth effect (*t* = −5.85, *p* = .000). Meanwhile, the pre- and post-test scores were irrelevant (*r* = .19, *p* = .198), which shows that the post-test scores were not affected by the pre-test. Finally, the mean and SD of the meta-cognitive knowledge dimension had also increased, compared to the pre-test (*M* = 2.8, *SD* = 1.2) and post-test (*M* = 4.2, SD = 1.5) and had significantly advanced (*t* = −4.79, *p* =. 000). In addition, the pre- and post-test scores were irrelevant (*r* = .07, *p* = .631), which shows that the post-test scores were not affected by the pre-test.

Table 4.10

Summary of paired-sample t-test of EG for test of knowledge of sustainability

Knowledge dimensions	Group	*Mean (SD)*		*df*	*t*	*p*	*r*
		Pre-test	Post-test				
Factual	EG	3.5 (1.2)	5.7 (2.1)	45	−6.32	.000	.12
Conceptual		2.6 (1.2)	4.1 (1.4)	45	−5.86	.000	.15
Procedural		2.4 (1.3)	4.0 (1.6)	45	−5.85	.000	.19
Meta-cognitive		2.8 (1.2)	4.2 (1.5)	45	−4.79	.000	.07

Note. n= 46. EG = Experimental Group.

In terms of the CG, the results of the paired-sample t-test are presented in Table 4.11. The factual knowledge dimension showed that there was a slight improvement compared to the pre-test (M = 3.2, SD = 1.4) and post-test (M = 3.6, SD = 1.8), but the growth effect had made no significant progress (t = −1.26, p = .211). Meanwhile, the score of the factual knowledge dimension before and after the test was irrelevant (r = 26, p = .067), and the post-test score was not affected by the pre-test. With regard to the conceptual knowledge dimension, the mean and SD had increased a little compared to the pre-test (M = 2.7, SD = 1.2) and post-test (M = 2.6, SD = 1.1); however, there was no significant growth effect (t = 0.08, p = .933). In addition, the pre- and post-test scores were irrelevant (r = .05, p = .692), which shows that the post-test scores were not affected by the pre-test. In the procedural knowledge dimension, although there was an increase compared to the pre-test (M = 2.5, SD = 1.4) and post-test scores (M = 2.9, SD = 1.2), the growth effect had not significant progressed (t = −1.94, p = .057). In addition, the pre- and post-test scores were irrelevant (r = .23, p = .100), which shows that they were not affected by the pre-test. Finally, in the meta-cognitive knowledge dimension, the mean and SD had a slight increase compared to the pre-test (M = 2.6, SD = 1.3) and post-test (M = 2.5, SD = 1.4), but had still not significantly improved (t = −0.24, p = .806). In addition, the pre- and post-test scores were irrelevant (r = .25, p = .073), which shows that the post-test scores were not affected by the pre-test.

Table 4.11

Summary of paired-sample t-test of CG for test of knowledge of sustainability

Knowledge dimensions	Group	*Mean (SD)*		*df*	*t*	*p*	*r*
		Pre-test	Post-test				
Factual	CG	3.2 (1.4)	3.6 (1.8)	49	−1.26	.211	.26
Conceptual		2.7 (1.2)	2.6 (1.1)	49	0.08	.933	.05
Procedural		2.5 (1.4)	2.9 (1.2)	49	−1.94	.057	.23
Meta-cognitive		2.6 (1.3)	2.5 (1.4)	49	0.24	.806	.25

Note. *n*= 50. CG = Control Group.

The overall results of the test of knowledge of sustainability, which was focused on evaluating the students' cognitive learning outcomes showed that the EG had significantly progressed in all the knowledge dimensions (p = .000). On the contrary, although the mean and SD of the factual and procedural knowledge dimensions of the CG had slightly increased, there was no significant improvement (p > 0.5) in all the knowledge dimensions. This indicates that the cognitive learning outcomes of sustainability of the students in the EG were better than those of CG students.

4.3.3 Analysis of paired-sample t-test for project performance

As can be seen from Table 4.12, the means and SD of the EG students had improved compared to the pre-test (M = 24.2, SD = 2.3) and post-test (M = 39.4, SD = 2.2). The CG students also showed an increase compared to the pre-test (M = 24.4, SD = 1.7) and post-test (M = 36.4, SD = 2.4). Both the EG (t = −17.65, p = .000) and CG (t = −11.13, p = .000) had significantly improved. Additionally, the pre- and post-test

scores of the EG (r = .51, p = .234) and CG (r = −.02, p = .950) were irrelevant, which shows that the post-test scores were not affected by the pre-test.

Table 4.12

Summary of paired-sample t-test for project performance

Test	Group	*Mean (SD)*		*df*	*t*	*p*	*r*
		Pre-test	Post-test				
Project performance	EG	24.2 (2.3)	39.4 (2.2)	6	-17.65	.000	.51
	CG	24.4 (1.7)	36.4 (2.4)	7	-11.13	.000	-.02

Note. N= 96. EG = Experimental Group; CG = Control Group.

The focus of the project performance was to analyse the students' socio-emotional and behavioural learning outcomes. Although both the EG and CG had improved when comparing the pre- and post-tests, the EG's mean and SD had increased more than those of the CG. This indicates that the students in the EG could apply socio-emotional and behavioural learning outcomes in their project performance more effectively than those in the CG.

4.4 Analysis of covariance (ANCOVA)

A one-way analysis of covariance (ANCOVA) was used to determine if there was a significant difference in the students' sustainability learning outcomes after the experiment. The course content design of the ESD (group) was taken as the independent variable, the post-test of sustainability learning outcomes as the dependent variable and the pre-test of sustainability learning outcomes as the covariate for the data analysis. Before conducting the one-way ANCOVA, the homogeneity of a within-group

regression coefficient test was firstly performed to determine if there was a significant interaction between the pre-test and the group. If the results of the homogeneity of the within-group regression coefficient test showed no significant interaction between the pre-test and the group, the one-way ANCOVA would continue to be used to analyse the data. In order to address the practical significance of the results of one-way ANCOVA, this study applied Cohen's *d* to examine the effect size by using the means, *SD* and sample size (Lakens, 2013). On the other hand, the Johnson-Neyman procedure applies to analyse the data when the within-group regression coefficient test presented a significant interaction between the pre-test and the group. According to D'Alonzo (2004), the Johnson-Neyman procedure can use to alternative ANCOVA when the assumption of homogeneity of regressions has been violated.

4.4.1 Analysis of homogeneity of the regression coefficient

The results of the the homogeneity of the regression coefficients within the group of the test of the questionnaire are presented in Table 4.13. The results indicated that there was a significant interaction between the pre-test and the group in terms of cognitive ($F = 13.12$, $p = .000 < .05$), socio-emotional ($F = 13.66$, $p = .000 < .05$) and behavioural variables ($F = 9.45$, $p = .000 < .05$). Hence, the Johnson-Neyman procedure continued to be apply for the data analysis.

Table 4.13

Summary of testing the homogeneity of the regression coefficient of questionnaire

Variables	Source	*SS*	*df*	*MS*	*F*	*p*
Cognitive	Pre-test	2.33	1	2.33	13.12	.000
	Error	16.35	92	0.17		
Socio-emotional	Pre-test	2.26	1	2.26	13.66	.000
	Error	15.23	92	0.16		
Behavioural	Pre-test	1.69	1	1.69	9.45	.003
	Error	16.44	92	0.17		

Note. *n*= 96.

Table 4.14 shows the homogeneity of the regression coefficients within the group of the test of the knowledge of sustainability, and the results indicated that factual (F = 0.12, p = .729 > .05), conceptual (F = 0.34, p = .559 > .05), procedural (F = 0.04, p = .831 > .05) and meta-cognitive (F = 0.72, p = .396 > .05) knowledge were not significant.

Table 4.14

Summary of testing the homogeneity of the regression coefficient to test students' knowledge of sustainability

Knowledge dimensions	Source	*SS*	*df*	*MS*	*F*	*p*
Factual	Pre-test	0.46	1	0.46	0.12	.729
	Error	352.13	92	3.82		
Conceptual	Pre-test	0.58	1	0.58	0.34	.559
	Error	157.02	92	1.70		
Procedural	Pre-test	0.09	1	0.09	0.04	.831
	Error	185.23	92	2.01		
Meta-cognitive	Pre-test	1.63	1	1.63	0.72	.396
	Error	206.50	92	2.24		

Note. n= 96.

With regard to the homogeneity of the regression coefficients of project performance within the group, Table 4.15 indicates that there was no significant difference (F = 0.63, p = .441 > .05) between the EG and CG.

Table 4.15

Summary for testing the homogeneity of the regression coefficient for project performance

Test	Source	*SS*	*df*	*MS*	*F*	*p*
Project performance	Pre-test	3.78	1	3.78	0.63	.441
	Error	65.08	11	5.91		

Note. n= 96.

In terms of the test of knowledge of sustainability and project performance, both the results of the homogeneity of the within-group regression coefficient test showed no significant interaction between the pre-test and the group. Therefore, the one-way ANCOVA continued to be used for the data analysis.

4.4.2 Analysis of covariance (ANCOVA) of the test of knowledge of sustainability

The results of the one-way ANCOVA analysis are shown in Table 4.16. After excluding the influence of the pre-test on the post-test, the results of the covariate analysis of the knowledge dimensions of factual [F (1, 93) = 26.15, p < .001], Cohen's d = 1.07; conceptual [F (1, 93) = 31.84, p < .001], Cohen's d = 1.19; procedural [F (1, 93) = 14.62, p < .001], Cohen's d = 0.83 and meta-cognitive [F (1, 93) = 27.65, p < .001], Cohen's d = 1.17. The results all reached a significant level and presented a large effect size (Cohen, 1988), indicating that the experimental intervention of the ESD course had a significant effect on the EG. Therefore, the ESD course intervention had succeeded in enhancing the students' cognitive knowledge of sustainability.

Table 4.16

Summary of one-way ANCOVA of the test of knowledge of sustainability

Knowledge dimensions	Source	*SS*	*df*	*MS*	*F*	*p*
Factual	Pre-test	13.55	1	13.55	3.57	.062
	Group	99.14	1	99.14	26.15	.000
	Error	352.59	93	3.79		

Knowledge dimensions	Source	*SS*	*df*	*MS*	*F*	*p*
Conceptual	Pre-test	1.87	1	1.87	1.10	.296
	Group	53.97	1	53.97	31.84	.000
	Error	157.61	93	1.69		
Procedural	Pre-test	8.46	1	8.46	4.24	.042
	Group	29.15	1	29.15	14.62	.000
	Error	185.32	93	1.99		
Meta-cognitive	Pre-test	6.00	1	6.00	2.68	.105
	Group	61.89	1	61.89	27.65	.000
	Error	208.14	93	2.23		

Note. n= 96. ANCOVA = analysis of covariance.

In addition, the mean of the post-test presented an adjusted number after excluding the influence of the pre-test on the post-test, which is shown in Table 4.17. The adjusted number of the mean of the EG showed that their factual (M = 5.7), conceptual (M = 4.1), procedural (M = 4.0) and meta-cognitive (M = 4.1) knowledge was all greater than the CG's adjustment of factual (M = 3.6), conceptual (M = 2.6), procedural (M = 2.9) and meta-cognitive (M = 2.5) knowledge. This finding demonstrated that the mean of all the knowledge dimensions of the EG in the post-test was significantly higher than that of the CG, which further showed that the intervention of the ESD course had a significant effect on the students' cognitive learning outcomes of sustainability.

Table 4.17

Mean of the post-test of the knowledge of sustainability of the EG and CG after excluding the influence of the pre-test on the post-test

Knowledge dimensions	Group	Mean *(SE)* of post-test after adjustment
Factual	EG	5.7 (0.2)
	CG	3.6 (0.2)
Conceptual	EG	4.1(0.1)
	CG	2.6 (0.1)
Procedural	EG	4.0 (0.2)
	CG	2.9 (0.2)
Meta-cognitive	EG	4.1 (0.2)
	CG	2.5 (0.2)

Note. N= 96. EG = Experimental Group; CG = Control Group; SE = Standard Error

4.4.3 Analysis of covariance (ANCOVA) of project performance

As can be seen from Table 4.18, the results of the covariance analysis of the project performance showed that there was a significant effect on the two groups [F (1,12) = 6.12, p < .05], Cohen's d = 1.26 in the post-test, it indicated a significant difference and presented a large effect size (Cohen, 1988). The EG's project performance of the socio-emotional and behavioural learning outcomes of sustainability was significantly better than that of the CG, indicating that the intervention of the ESD course had a significant influence.

Table 4.18

Summary of one-way ANCOVA of the test of project performance

Test	Source	*SS*	*df*	*MS*	*F*	*p*
Project performance	Pre-test	4.65	1	4.65	0.81	.385
	Group	35.14	1	35.14	6.12	.029
	Error	68.86	12	5.73		

Note. n= 96. ANCOVA = analysis of covariance

Furthermore, the mean of the project performance in the post-test which controls the influence of the pre-test on the post-test is presented in Table 4.19. The results indicate that the mean of the EG in the post-test (M = 39.5) was higher than that of the CG (M = 36.4). This further demonstrates that the ESD course had a significant effect on increasing the socio-emotional and behavioural learning outcomes of sustainability of the students in the EG.

Table 4.19

Mean of the post-test of the project performance of the EG and CG after excluding the influence of the pre-test on the post-test

Factor	Group	Mean *(SE)* of post-test after adjustment
Project performance	EG	39.5 (0.9)
	CG	36.4 (0.8)

Note. n= 96. EG = Experimental Group; CG = Control Group; SE = Standard Error

4.5 Johnson-Neyman procedure

A Johnson-Neyman procedure was conducted to determine if there was a significant difference in the students' sustainability learning outcomes after the experiment. The course content design of the ESD (group) was taken as the independent variable (X), the post-test of sustainability learning outcomes as the outcome variable (Y) and the pre-test of sustainability learning outcomes as the moderator variable (W) for the data analysis.

4.5.1 Analysis of the results of Johnson-Neyman procedure on the questionnaire

The analytical results of using the Johnson-Neyman procedure on the questionnaire are discussed in terms of three variables: cognitive, socio-emotional and behaviour. With regard to the cognitive variable, it is shown in Table 4.20 that the significant difference was showed on the EG students whose pre-test results at 4.408 ($p = .050$). This indicated that the experimental intervention of the ESD course had a significant effect on the EG students whose pre-test results were from 3.000 to 4.400 ($p < .050$) (Miyazaki & Maier, 2005) compared to the CG. The results of pre-test from 3.000 to 5.000 of Johnson-Neyman procedure of the cognitive learning outcome of the questionnaire can be seen in Appendix XV. However, the experimental intervention of the ESD course had no significant effect on the EG students whose pre-test results were from 4.500 to 5.000 ($p > .050$). These results indicate that the intervention of the ESD course had no significant influence on the EG students who had shown high cognitive learning outcomes in the pre-test (from 4.500 to 5.000). However, the intervention of the ESD course was shown to have a significant effect on increasing the cognitive learning outcome of EG students who had low and middle cognitive learning outcomes in the pre-test (from 3.000 to 4.400). On the other hand, the intervention of the ESD

course had no significant influence on EG students who demonstrated high cognitive learning outcomes in the pre-test. The plot of the conditional effects in Figure 4.1 shows that the effect of the influence exerted by the ESD course on the post-test of cognitive learning outcomes is conditional on the range of the pre-test outcomes.

Table 4.20

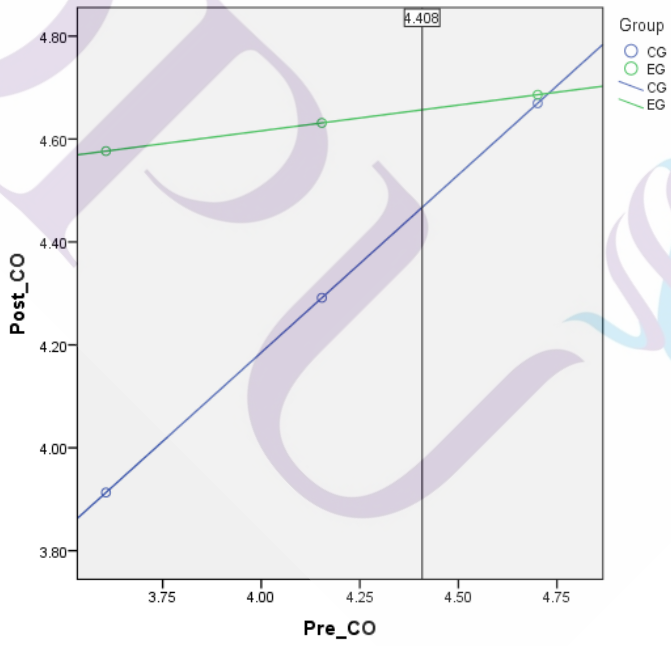
Summary of the result of significant difference of Johnson-Neyman procedure of the cognitive learning outcome of the questionnaire

Variable Pre-test of cognitive	Effect	95% CI [*LL*, *UL*]	*SE*	*t*
4.408	0.18	[0.00, 0.37]	0.09	1.98*

Note. *n*= 96. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

Figure 4.1

Johnson-Neyman plot of the cognitive learning outcomes of the questionnaire



Note. This figure shows the results of the cognitive learning outcomes of the Johnson-Neyman procedure. *N*= 96. EG = Experimental Group; CG = Control Group; Pre_CO = pre-test of cognitive learning outcomes; Post_CO = post-test of cognitive learning outcomes.

[a] The number of 4.408 represents the significant progress of EG students who had pre-test lower than 4.408 in the post-test compared with CG students. On the other hand, there was no significant influence on the EG students who had pre-test scores higher than 4.408 in the post-test score compared with CG students.

In terms of the socio-emotional variable, a significant difference was shown on the EG students whose pre-test results were at 4.188 (p = .050) in Table 4.21. The results of pre-test from 3.000 to 5.000 of Johnson-Neyman procedure of the socio-emotional learning outcome of the questionnaire can be seen in Appendix XVI. Although the experimental intervention of the ESD course had a significant effect on the EG students whose pre-test results ranged between 2.500 and 4.125 (p < .050) compared with the CG (Miyazaki & Maier, 2005), the experimental intervention of the ESD course had no significant effect on the EG students whose pre-test results ranged between 4.250 and 5.000 (p > .050). These results indicated that the intervention of the ESD course had no significant influence on the EG students who showed high socio-emotional learning outcomes in the pre-test (between 4.250 and 5.000). However, the intervention of the ESD course had the significant effect of increasing the socio-emotional learning outcomes of those EG students who showed low and middle socio-emotional learning outcomes in the pre-test (between 2.500 and 4.125). On the other hand, the intervention of the ESD course had no significant influence on the EG students who showed high socio-emotional learning outcomes in the pre-test. The plot of conditional effects in Figure 4.2 shows that the effect of the influence exerted by the ESD course on the post-test of socio-emotional learning outcomes is conditional on the range of the pre-test outcomes.

Table 4.21

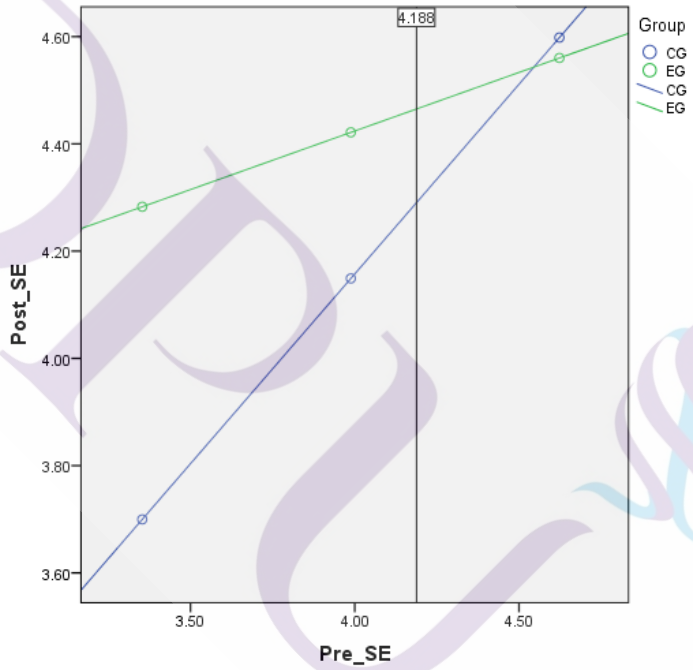
Summary of the result of significant difference of Johnson-Neyman procedure of the socio-emotional learning outcome of the questionnaire

Variable	Effect	95% CI [*LL*, *UL*]	*SE*	*t*
Pre-test of socio-emotional				
4.188	0.17	[0.00, 0.34]	0.08	1.98*

Note. n= 96. CI = confidence interval; *LL* = lower limit; *UL* = upper limit

Figure 4.2

Johnson-Neyman plot of the socio-emotional learning outcomes of the questionnaire



Note. This figure demonstrates the results of the socio-emotional learning outcome of the Johnson-Neyman procedure. *N*= 96. EG = Experimental Group; CG = Control Group; Pre_CO = pre-test of cognitive learning outcomes; Post_CO = post-test of cognitive learning outcomes.

[a] The number of 4.188 shows the significant progress in the post-test of those EG students who had pre-test results lower than 4.188 compared with CG students. On the other hand, there was no significant influence on the EG students who had pre-test scores higher than 4.188 in the post-test compared with CG students.

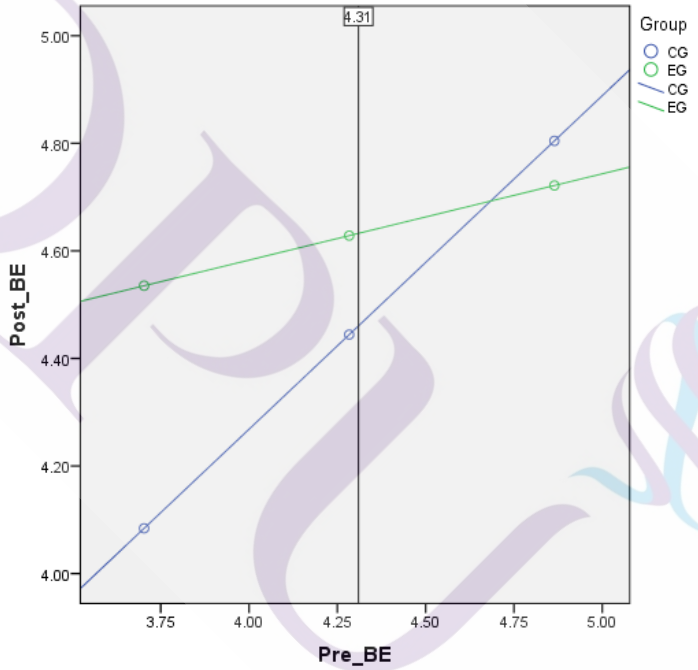
Finally, in the behavioural variable, it is shown in Table 4.22 that the significant difference was showed on the EG students whose pre-test results at 4.310 (p = .050). The results of pre-test from 3.000 to 5.000 of Johnson-Neyman procedure of the cognitive learning outcome of the questionnaire can be seen in Appendix XVII. The experimental intervention of the ESD course had a significant effect on the EG students whose pre-test results ranged between 3.000 and 4.300 ($p < .050$) compared with the CG students (Miyazaki & Maier, 2005). On the other hand, the experimental intervention of the ESD course had no significant effect on the EG students whose pre-test results ranged between 4.400 and 5.000 ($p > .050$). These results indicate that the intervention of the ESD course had no significant influence on the EG students who had high behavioural learning outcomes in the pre-test (between 4.400 and 5.000). However, the intervention of the ESD course had the significant effect of increasing the behavioural learning outcome of the EG students who had low and middle scores in the pre-test (between 3.000 and 4.300). On the other hand, the intervention of the ESD course had no significant influence on the EG students who had high behavioural learning outcomes in the pre-test. The plot of the conditional effects in Figure 4.3 shows how the effect of the influence exerted by the ESD course on the post-test of behavioural learning outcomes is conditional on the range of the pre-test outcomes.

Table 4.22
Summary of the result of significant difference of Johnson-Neyman procedure of the behavioural learning outcome of the questionnaire

Variable	Effect	95% CI [*LL*, *UL*]	*SE*	*t*
Pre-test of behavioural				
4.310	0.17	[0.00, 0.34]	0.08	1.98*

Note. *n*= 96. CI = confidence interval; *LL* = lower limit; *UL* = upper limit

Figure 4.3
Johnson-Neyman plot of the behavioural learning outcomes of the questionnaire



Note. This figure demonstrates the results of the behavioural learning outcome using the Johnson-Neyman procedure. *N*= 96. EG = Experimental Group; CG = Control Group; Pre_CO = pre-test of cognitive learning outcomes; Post_CO = post-test of cognitive learning outcomes.

[a] The number of 4.310 indicates that the EG students who had pre-test scores lower than 4.310 showed significant progress in the post-test compared with the CG students. On the other hand, the EG students who had pre-test scores higher than 4.310 showed no significant influence in the post-test compared with the CG students.

The purpose of the questionnaire was to examine three dimensions of the students' sustainability learning outcomes, namely, cognitive, socio-emotional and behavioural. The questionnaire was designed based on a five-point Likert scale from "strongly agree" to "strongly disagree". The overall results indicated that the EG students who were equipped with low and middle sustainability learning outcomes (cognitive < 4.408; socio-emotional < 4.188 and behavioural < 4.310) before the ESD intervention demonstrated a significant increase in all dimensions ($p < .050$) after taking the ESD intervention. However, the ESD intervention had no significant influence on all the dimensions (cognitive > 4.408; socio-emotional > 4.188 and behavioural > 4.310) of the EG students who were equipped with high sustainability learning outcomes before the intervention. This indicated that the intervention of the ESD course is effective for students with lower scores of sustainability learning outcomes rather than students with high scores.

4.6 Analysis of interview

The primary objective of the interviews was to complement the quantitative research with an in-depth and detailed explanation of the results. The interviewees in these semi-structured interviews were the 10 participants from the EG, and a thematic analysis was applied to explore their perspective of the experimental intervention from the interview transcripts. According to Braun and Clarke (2006), a thematic analysis is useful for identifying the patterns in qualitative data. This is effective for learning and teaching research due to its advantage of flexibility, which enables the researcher to make more diverse discoveries (Maguire & Delahunt, 2017).

The interview questions were designed and developed from the questionnaire applied in this study. Therefore, the interview questions consisted of four categories,

namely, cognitive, socio-emotional, behavioural learning outcomes and employability. In terms of employability, it was evident from the literature review that sustainable business practices are an essential skill for business graduates today (Chen et al., 2018). A total of 12 open-ended questions were conducted for the interview, three of which were related to cognition, four to socio-emotion, three related to behavioural learning outcomes and the remaining two to employability. Sample data from the interviews in the Chinese language can be found in Appendix XVIII. In terms of confidentiality and anonymity, the 10 interviewees were named as P1 to P10 in the excerpts.

4.6.1 Cognitive learning outcomes

Three themes were established for cognitive learning outcomes: awareness, knowledge of business SD and perceived benefit.

Awareness of global citizenship: students' awareness of being global citizens can be awakened by learning ESD from the objectives of SDGs. Most of the students who were interviewed proposed that everyone is accountable for SD because we all live on the same planet:

> Environmental pollution is worse due to the increase in the global population. SD issues, such as the over-exploitation of resources, are all caused by humanity. So, I think everyone is responsible for SD. (P8)

The integration of these objectives into professional content can increase students' awareness of SD (García-Feijoo et al., 2020). Some of the participants had different views of who should take more responsibility for SD. They maintained that governments and corporations should be the principal drivers of SD, rather than

individual citizens. They also pointed out that a declaration by governments and corporations of their commitment to sustainability could influence the awareness of their citizens:

> The government needs to bear the main responsibility for SD because if it showed a strong attitude toward it and enacted some related regulations, it would draw citizens' attention to it. (P9)

> Businesses should play the role of leader and show that they care by advocating the production of green products, so that consumers can learn about the concept of SD from their purchasing experience. In my opinion, this is the best way to promote SD rather than learning about it from books, advertisements or commercials. (P7)

Knowledge of business SD plan: the students realised that partnership is the root of sustainability-orientated industry in the future. Furthermore, they expressed the essence of cooperation in the business community:

> I think that a consensus of SD among businesses and a recognition of the importance of an economic community can convince competitors to work together. (P6)

This finding supports the results of the test of knowledge of sustainability, which showed that the knowledge dimensions of the students had significantly increased. In this study, the content design of the ESD course included a discussion that entailed a comparison of Thailand and China, which are the countries of which the students had life experience. Zhou et al., (2020) emphasise that it is essential to introduce students

to SD from a local perspective to develop their knowledge. The connection between students' life experience and SD is also highlighted in many business schools, such as Glasgow Caledonian University and the Sobey School of Business. It is worth noting that one of the participants mentioned that entrepreneurs should be aware of the concept of SD:

> Entrepreneurs need to practice SD for the long-term development of their business. If I was an entrepreneur, I would try to practice it. (P10)

This is related to the studies of researchers who have claimed that the stress of entrepreneurship can assist in educating students on the notions of sustainability and responsibility (Sánchez Hernández & Maldonado-Briegas, 2019; Rashid, 2019; Wong, 2017).

Perceived benefit: The content design of an ESD course should include the perceived benefits of the implementation of SD. Some of the students (n=4) claimed that the perceived benefit is the main factor to influence a corporation to practice SD:

> In my opinion, it is good for a company to implement a sustainability plan if it does not interfere with its benefits. (P4)

> If a sustainability plan can have a positive effect on my business, I would definitely try to implement it. (P6)

According to Cantele and Zardini (2020), the perceived benefit is the enabling factor in companies' decision to implement sustainability practices. The lack of understanding of the potential benefits of SD is a barrier to incorporating sustainability (Fathalizadeh, et al., 2021).

4.6.2 Socio-emotional learning outcomes

Three themes were associated with socio-emotional learning outcomes: attitude toward SD, motivation for SD actions and self-interest.

Attitude toward SD: Most of the students had a positive attitude toward brands with responsible management that implemented SD, which is likely to influence their purchasing behaviour:

> Many people have lost their jobs during the COVID-19 pandemic. It was reported that one company recruited unemployed disabled people, so I do my best to buy its products. I will try to support it because its actions are of benefit to society. (P4)

Meanwhile, students also expressed a consideration of the well-being of future generations:

> I think SD is necessary to think about the living environment of the next generations. We can use resources based on a cradle-to-cradle design to solve this problem. (P2)

Therefore, SDG-orientated education has a positive impact on students' attitude toward personal responsibility, which corresponds to the research of Sánchez-Hernández and Maldonado-Briegas (2019).

Motivation of SD action: Students' motivation can be enhanced by the realisation of their personal values. The results of exploring the students' purchasing experience indicated that most of them would purchase products/services for ethical or

environmental reasons because contributing to SD would be a demonstration of their personal values:

> Buying products that can be reused or made from recycling resources makes me feel that my purchasing behaviour is meaningful. (P8)

> Just a few days ago, I chose an environmentally-friendly cup when I bought coffee. It cost me more than a plastic cup, but it felt great to contribute to the environment in this way. (P10)

Since personal values are a positive factor that influences responsible behaviour (Pinto et al., 2011), there is a need to emphasise the contribution of personal values to making ethical decisions in the course design (Gentile, 2017). In this study, personal values have been highlighted in the theme of green and pro-environmental behaviour and delivered by the reflective observation of personal behaviour. This has a positive influence on the students' motivation. This finding is in accordance with the results of project performance, which showed that students' motivation toward SDGs had improved.

Self-interest: Although the students were aware of SD and responsible management, their self-interest influenced their engagement in sustainable action. Some students (n=5) stated that the concern of responsible management and SD implementation are the main factors that affect their purchasing decision, however, others claimed that price and quality also need to be considered:

> The key factors for me are quality and price. I will choose an environmentally-friendly product if I can afford it. (P9)

Meanwhile, these students also mentioned that they only consider SD when it directly affects their self-interest:

> I absolutely care about responsible management or the implementation of SD that affects my health, such as food productions brands, but I don't care about it otherwise. (P6)

> I care about future generations and current development at the same time, so we should not limit current development. There should be a balance between the expenditure of resources on current development and the wellbeing of future generations. (P1)

The understanding of self-interest in relation to SD should be more explicit in order to increase the practice of sustainable action (White, et al., 2019). The theme of self-interest was not addressed in the design of the ESD course in this study, which may explain the results of the questionnaire, which showed that the course did not effectively influence those students who were highly aware of SD.

4.6.3 Behavioural learning outcomes and employability

One theme was associated with behavioural learning outcomes: Supporting people-orientated governance to practice SD.

Supporting people-orientated governance to practice SD: Most of the students claimed that they would consider the concept of SD in the form of good governance in their

company if they were entrepreneurs. People-orientated governance was mentioned in the interview:

> In my opinion, people-orientated governance enables all employees to feel that they are participating in the operation of the enterprise. They feel as if they own the business, so I think this is a good way to govern a company. (P5)

It worth noting that the factor of self-interest was also addressed:

> I think employees are most concerned about income, welfare and security. Sharing the profit with employees may increase their sense of achievement and well-being. (P10)

> If self-interest is not satisfied, I think is very hard to practice SD. This is also the main reason why some enterprises fail to practice it. (P8)

It is clear that self-interest is the main factor to increase socio-emotional and behavioural learning outcomes.

Although employability was not a central category of this study, it was included as a contribution to future studies based on understanding the students' perspective of the benefits of an ESD course and the essence of the sustainability learning outcomes. Most of the students mentioned that the ESD course had increased their knowledge of the strategies used by businesses to practice SD:

> My knowledge of the implementation of SD in business has been enhanced by this course. I will try to use these ideas in my company if I ever have a chance to become an entrepreneur. (P4)

> The business cases in the course have helped me to understand how to develop SD in a business model. This gives me a deep understanding of how to practice it from a business perspective. (P7)

Besides, the students stated that learning from the ESD course could assist them to increase their employability because sustainability is the trend of the current job market:

> I think this course is helpful for my future employment. For example, if I work in the brand management field, I can know more about how to increase brand value by implementing an SD strategy. (P3)

> I think this course is helpful for me because my major is international business management. This course has increased my skill and understanding of the value of SD, which is essential for jobs in commercial management or international trade. (P10)

The above excerpts represent the perspective of the students in the experimental group after the intervention of the ESD course. The interview questions were based on four categories: cognitive, socio-emotional, behavioural learning outcomes of sustainability and employability. In order to present a comprehensive description of the results of the students' sustainability learning outcomes, the quantitative and qualitative results are integrated in Table 4.23 below.

Table 4.23

Comparison of quantitative and qualitative results to students' sustainability

Sustainability	Statistical result	Interview	Finding
Cognitive	Students' cognition of SD had significantly increased in the test of knowledge after the intervention of the ESD course.	Awareness: Students demonstrated an awareness of SD. Knowledge of business toward SD: Entrepreneurship and partnership were highlighted in the interview.	Perceived benefit: Students' cognition influenced by perceived benefits.
Socio-emotional and behavioural	Students demonstrated a significant increase in the project performance.	Attitude: The students showed a positive attitude toward SD.	Self-interest: The design of the ESD course should address self-interest in a comprehensive way to promote sustainable action.
	However, the results of questionnaire indicated that the intervention of the ESD course is effective for students with lower and middle sustainability learning rather than those with high scores.	Motivation for SD action: The realisation of self-value is the driver of students' motivation for SD action.	
		Supporting people-orientated governance to practice SD.	

4.7 Conclusion

Three main points are highlighted by the above data. The first is that the ESD course succeeded in effectively increasing the international Chinese college students' cognitive learning outcomes. The inclusion of entrepreneurship and partnership in the content can be considered as a useful approach to deliver an ESD course. Meanwhile, perceived benefit was the factor that most influenced these students' cognitive learning outcomes.

Secondly, the ESD course was effective for those international Chinese college students with low and middle socio-emotional and behavioral learning outcomes. One of the influential factors was the realisation of self-value in contributing to SD.

Thirdly, the lack of a comprehensive understanding of self-interest is the reason why the ESD course was not effective for those international Chinese college students with high socio-emotional and behavioral learning outcomes.

CHAPTER 5

DISCUSSION

The primary objective of this chapter is to discuss the analytical results presented in Chapter four. A summary of the overall research purpose, research procedure and answers to the research questions will be provided in a general discussion. Furthermore, the contribution of this study will be discussed based on the main findings.

5.1 General discussion

The aim of this study is to transform business education by embedding ESD in the curriculum of higher education in the hope of enhancing the students' sustainability learning outcomes. Although the awareness of ESD in HEIs has been widely discussed in previous research (Bartlett et al., 2020; Hong, 2020; Savelyeva & Douglas, 2017) since the United Nations established an SD agenda to transform our world based on the achievement of 17 goals (SDGs) (United Nations, 2015), there is still an urgent need to develop a sustainability curriculum for HEIs (Bartlett et al., 2020; Tandon, 2017; Weybrecht, 2022) by moving to the experimental stage of the plan to reform the current curriculum (Lozano et al., 2017). Following the industrial drive toward sustainability, there is growing evidence of the need for business graduates to possess a sustainability mindset and practice (Haney et al., 2020; Winfield & Ndlovu, 2019). Business graduates are expected to be equipped with the conceptual knowledge of sustainability and practice it in the business environment as general graduate skills in higher education (Mather et al., 2011).

PRME play a significant role in advocating responsible decision-making and an SD mindset to reform business education based on six principles (Forray & Leigh, 2012; PRME, 2020c), which have become known as the PRME framework to assist the development of ESD in higher education. The common objective of ESD and PRME is the achievement of the SDGs, which provide an explicit way for HEIs to navigate a pathway to ESD (UNESCO, 2021). In terms of business education, the learning objectives of SDGs 8, 9, 11, 12 and 17 are included in the business programme (Kolb et al., 2017). Therefore, this study is based on ESD, SDGs (SDG 8, 9, 11, 12, 17), and six PRME principles to develop the curriculum in the business programme.

Four research questions were devised to elicit responses that would help to achieve the research aim. The first question involved identifying the learning outcomes of ESD in a higher education business programme, and a web-based content analysis was used to explore possible outcomes. The empirical data was collected from ten samples from the PRME champion schools in 2020-2021 in relation to ESD. Fifty-six learning outcomes were selected for the business programme as a result of this web-based content analysis, as shown in the Appendix. Furthermore, five experts were commissioned to map the current curriculum module and learning outcomes to determine their interrelationship. The revised current curriculum module and learning outcomes are shown in Appendix V.

The second question was devised to respond to the gap in experimental research of the integration of SD into the university curriculum (Lozano et al., 2017). This question involved defining a PRME-based ESD curriculum for business programme for international Chinese college students. The course design in this study

was based on using ESD learning outcomes, the answer to question one, and the six PRME principles to deliver education for sustainability in business programmes. Therefore, the brand management course design consisted of the integration of a three-phase model based on a correlation of sustainability and the PRME principles proposed by de Paula Arruda Filho (2017). Brand Management is a required course for international business management majors, with 3-credit hours. Many prior researchers have emphasised the positive impact of the integration of sustainability and responsibility in brand management on brand value, as well as an improved business performance (Goworek, 2017). The difference between integrating PRME-based ESD into the Brand Management course and other sustainable business curricula is that the six PRME principles have been redefined by this study and are further to applied to be the base of course themes. The course content is shown in Table 3.7, with 15 classes divided into three phases. The ESD course syllabus and lesson plan are presented in Appendix VII.

The third question involved the impact of an ESD course intervention on the development of international Chinese college students' sustainability learning outcomes. A teaching experiment was undertaken in order to consider this question by examining the efficiency of the design of the ESD course in terms of the brand management content. Furthermore, interviews were conducted after the intervention of the ESD course, and the results indicated that the ESD course was effective in increasing the EG students' sustainable learning outcomes on account of the relationship between perceived benefit and business performance, self-value and responsible management.

The fourth question involved determining whether the sustainability learning outcomes of the international Chinese college students in the ESD intervention were better than those of the students in the regular college business course. The results of an experiment firstly indicated that the ESD course was extremely effective in increasing the cognitive learning outcomes of international Chinese college students, and secondly, that the ESD course was not effective for those international Chinese college students with high socio-emotional and behavioural learning outcomes due to the factor of self-interest.

5.2 ESD learning outcomes in the business programme of higher education

The ESD learning outcomes in the business programme were examined in this study via the indicators of SDGs, which can be applied in different educational contexts (Stubbs et al., 2021). The integration of ESD should advocate the achievement of SDGs (Leicht et al., 2018) and be aligned with SDG learning outcomes and content (Boström et al., 2021). Many HEIs are already mapping their teaching and learning activities with SDGs to promote sustainability (Ketlhoilwe & Velempini, 2020; Nhamo & Mjimba, 2020). Several researchers have mentioned the relevance of SDGs 8, 9 ,11, 12 and 17 in the business field (Cicmil et al., 2017; Dowd, 2016; Killian et al., 2019). SDGs 8, 9, 11 and 12 are linked to management and business models (Greenberg et al., 2017) while SDG 17 is the foundation of all goals because cross-disciplinary collaboration is the key to achieving them (Hays et al., 2020). Therefore, ESD learning outcomes are examined in this study based on SDGs 8, 9, 10, 11, 12 and 17 due to them being essential for business education. Focusing on a small group of SDGs is more effective for developing ESD than addressing all of them (17 SDGs with 169 targets),

primarily for developing students' knowledge and skill in depth and avoiding decoupling (Kolb et al., 2017; Ndubuka & Rey-Marmonier, 2019).

The learning outcomes of ESD have been established in business programmes devoted to sustainability via the approach of connecting them with SDGs. The approach begins with a redefinition of the programme's mission to promote SD. According to the new mission, the main themes are established in the programmes based on their characteristics, such as history and culture, and these main themes constitute a framework to connect courses with specific SDGs (Greenberg et al., 2017; Wood & Pansarella, 2019). Some researchers have emphasised that aligning programmes' learning outcomes with SDGs can contribute to sustainability (Chaleta, et al., 2021; Kioupi & Voulvoulis, 2020; Rajabifard, et al., 2021). According to Kioupi and Voulvoulis (2020), evaluating the programmes' learning outcomes with SDGs is a good way to assess their devotion to ESD. It is clear that the approach to setting ESD learning outcomes in a university programme entails referring to the SDGs, which provide crucial knowledge, skills, attitudes, and behaviour of learning objectives to foster the sense of SD in higher education (Rieckmann, 2017).

The integration of ESD learning outcomes in the entire business curriculum was established in this study with a statement of the cultivation of the sense of SD requiring a holistic learning experience in a university. This means that the building of ESD should include a cognitive foundation and the motivation to develop socio-emotion skills for behaviour in practice because the promotion of ESD in business programmes has generally been faced with the crucial issue of students feeling that there was no connection between business and sustainability (Weybrecht, 2021). This exposes the key starting point of delivering ESD, which is to redefine the nature of the

business because the ability to build students' perspective of sustainability is one of the core components of any business, which is not an option for adding value. Redefining the nature of the business and building this perspective for students is the root of moving forward to achieve the purpose of ESD.

Consistent with the statement that ESD learning outcomes should be integrated into the business curriculum in both general education and professional courses to provide a holistic view, some researchers have studied the integration of ESD learning outcomes in general higher education courses. For example, Chulalongkorn university integrated ESD in general education courses and required all undergraduate students to take at least 30 credit hours based on the claim that SD knowledge and skills are the foundation of their personal development (Chulalongkorn University, 2020–2021; Rukspollmuang, 2017). Due to the consideration that students' development should focus more on their personality in order to avoid emphasising a narrow frame of the workforce (Király & Géring, 2019). Koh and Teh (2021) applied Maslow's hierarchy of human needs to develop an ESD plan for HEIs. They affirmed that ESD begins with the fundamental physiological need to build a base and further achieve self-realisation and the fulfilment of one's personal potential. Hence, ESD should be broadly integrated in a course for the benefit of every student. However, it should be noted that if the ESD integrated in business programmes is only implemented in general education courses, it may be a barrier to students who do not perceive that SD is part of their professional skills. Building a correlation between sustainability and students' major can increase the efficiency of teaching and learning (Leal Filho, 2021).

The concept of sustainability should not be delivered separately from business courses if the nature of business is to be redefined. The ESD learning outcomes can be explicit or implicitly designed in the content according to the aim of the course. The content needs to be designed based on the aim of the course in order to establish the main objective of sustainability, rather than explicitly referring to the SDGs in every course (Stubbs et al., 2021).

5.3 Development of PRME-based ESD curriculum in a higher education business programme

PRME is perceived as an initiative for the reform of business education (Forray & Leigh, 2012). The six PRME principles were applied as the framework for the curriculum development in this study due to the PRME having the same objectives as ESD. PRME principles 1 and 2 are highlighted in the first phase of the course design in this study based on using the approach of ERS (ethics, responsibility and sustainability) to further increase students' awareness and to deliver a new perspective of the relationship between ERS and business. ERS has become the required content in the curriculum, which is now generally used to develop responsible management in business schools (Abdelgaffar, 2021; Laasch, 2021) being based on the notion of self-value as a global citizen and leader.

PRME principles 3 and 4 are the components of the second phase of the course design, which are delivered by the topic of SDGs in different contexts and SD values. The content of SDGs is delivered in this study based on the concept of localisation with a focus on Thailand and China, because the course is designed for delivery to international Chinese students who are studying in Thailand. Hence, the content should have a connection with the students' background in order to build an

engagement with them and motivate them. Sustainability education should be based on local experience (Caniglia et al., 2018) and the localisation of SDGs can help to link the students to contemporary issues when they are related to their life experience (Aikens et al., 2016). This is an extremely effectively way to develop students' knowledge (Zhou et al., 2020).

PRME principles 5 and 6 are the components of the third phase of the course design, which involves a real business world and project approach. The course content was delivered by guest lecturers to emphasise the connection with stakeholders to deliver the idea of sustainability in real-world issues. The guest lecturer was a type of external facilitator, who could increase the course content of PRME (Borglund et al., 2019). Furthermore, the project approach was applied to require students to connect with the SDGs. According to Hays et al. (2020), engaging students in a PRME-project to learn about sustainability by highlighting SDGs to design curricular activities can inspire their SD actions in real-life settings.

The course design in this study was based on a framework of six PRME principles and the SDGs as the learning objective of ESD, which was not the entrepreneurship approach. However, according to the findings, entrepreneurship may be considered as a useful approach to delivering an ESD course. In their research, Sánchez-Hernández and Maldonado-Briegas (2019) proved that learning sustainability based on an entrepreneurial culture has a significant effect on students' attitude toward social responsibility. The entrepreneurship approach is used to address SD issues by entrepreneurial behaviour, which is especially linked to the development of sustainable business (Ionescu et al., 2020). This enforces the relationship between business and sustainability and enables students to redefine the nature of business. According to

Wong (2017), the application of the entrepreneurship perspective increases students' engagement with the course and "helps to explore the question of what is a sustainable business" (p.180). Similar to this study, Ortiz-de-Urbina-Criado et al., (2022) emphasise that it is essential to include SDGs 8, 9, and 12 as sustainability objectives in a business and management curriculum, but they also argue that the content should be taught from an entrepreneurial approach.

5.4 Sustainability learning outcomes of international Chinese college students

The students' cognitive learning outcomes were found to have effectively increased after the intervention of the ESD course. This was evident from their awareness and knowledge of business from the perspective of SD. Three factors had influenced their cognitive learning outcomes. The first was the use of the PRME and SDGs in the construction of the course. The PRME was used as the framework and six PMRE principles were used as themes to develop the course and clarify its aim. The application of these themes, which allowed for the integration of SDGs from a responsible management perspective, meant that the content could simultaneously connect SDGs and business to create an environment for discussion, rather than delivering the notion of sustainability separate from business. The concept of sustainability should be taught from a management perspective to emphasise to students that sustainability is a component of business. In their research, Høgdal et al. (2021) found that students used buzzwords to describe social responsibility when they did not feel that it was part of the course. PRME provides an engaging structure for curriculum development that includes various disciplines in the business field, such as marketing (Bauer, 2017), while SDGs are a suitable guide for creating business students' awareness of sustainability (García-Feijoo et al., 2020).

Secondly, the content of the course demonstrates the benefit of practising sustainability to corporations by integrating ESD into brand management based on a responsible management approach. The findings proved that connecting perceived benefits to the business performance using ESD content can increase students' awareness and knowledge of SD in business. Perceived benefits are the advantages a corporation can gain by implementing sustainability processes in terms of its brand image and reputation (Agan et al., 2013). In this study, the course content began with setting a brand positioning based on a social purpose to restructure the brand culture to produce brand equity, which emphasises the competitive advantages for the brand of adopting a sustainability strategy. As Cantele and Zardini (2020) observe, understanding the perceived benefits can drive managers toward sustainability. The findings of this study support the conclusion that perceived benefit should be embedded in the sustainability practice content of the course to strengthen students' awareness and knowledge of SD.

Thirdly, Swaim et al., (2014) propose that collaboration with guest lecturers in the industry can enhance students' attitude toward sustainability, especially when they share cases or vivid perspectives in the class. Two industry guest lecturers were invited to share their concept of sustainability in the real business world in this study and they both did it by using actual business cases. One of them implemented an award scoring game, in which students needed to respond to the questions in every section and prizes were awarded to the top five. Therefore, it can be confirmed from this study that collaboration with guest lecturers is effective in influencing students' cognitive learning outcomes.

In terms of their socio-emotional and behavioural learning outcomes, the ESD course was found to be effective for students with low- and middle learning outcomes. The findings indicated that the realisation of self-value is a factor that affects students' socio-emotion and behaviour toward SD. The course design addressed the factor of self-value with the aim of enabling students to understand that their behaviour is crucial for SD and that they can be agents for change to contribute SD via self-value. This involved the implementation of two approaches, the first of which was the reflective observation of personal consumer behaviour when students were asked to share their experience of being a consumer and discuss the impact of SD in the class. Personal consumer behaviour is about decision-making, which involves delivering an understanding of their personal impact to students and increasing their awareness of their responsibility for SD (Copenhagen Business School, 2019; University of Dubai, 2015-2016). Besides, a discussion from a peer perspective can influence their mental attitude toward sustainability (Swaim et al., 2014). The second approach involves a hands-on project based on the topic of social purpose. A hands-on project can assist students' self-assessment and influence their belief of their personal engagement in a specific behaviour (Swaim et al., 2014). The findings of the influence of self-value supports the research of Pinto et al. (2011), who also found that self-value is a positive factor that influences responsible behaviour. Hence, it is essential to emphasise self-value in the curriculum (Gentile, 2017).

On the other hand, the ESD course was not effective for students with high socio-emotional and behavioural learning outcomes. The findings indicated that the lack of a comprehensive understanding of self-interest was the cause of this result. Janmaimool and Chontanawat (2021) affirm that self-interest is a significant factor to

influence university students' sustainable behaviour. Therefore, universities should emphasise the advantages of SD action, such as the monetary benefit and convenience, because individuals who practice sustainability due to self-interest will increase their sustainability behaviour (De Dominicis et al., 2017). Hay and Eagle (2019) agree that the curriculum needs to cover the issue of self-interest due to the increasing focus of undergraduate business students on self-interest. However, the content design of the ESD course in this study did not focus on self-interest, which is likely to be why it was not effective in influencing the socio-emotional and behavioural learning outcomes of all the students.

Besides, the intervention of ESD was integrated into a mandatory course in the business programme in this study, which is another factor that may have affected the outcome of students' sustainability learning. Students may have a different attitude when studying a mandatory course versus an elective one. If ESD content is integrated into a mandatory course, it seems to emphasise the importance of sustainability. Hence, students may pay more attention to studying PRME issues when the content is mandatory compared with an elective course (Buono, 2017), which is bound to influence their learning outcome. Rasche et al. (2013) highlight the importance of business schools' provision of ethical education in a mandatory course rather than an elective one because the latter is inconsistent with the programme's learning outcomes. Therefore, the integration of ESD into a mandatory course is considered to be a factor that influenced the students' sustainability learning outcomes in this study.

CHAPTER 6

CONCLUSION

This chapter is to conclude the significance of the findings of this study, as well as to present implication, and recommendations for further research on sustainability in business education based.

6.1 Conclusion

The aim of this study was to transform business education by embedding ESD in the course to cultivate the students' sustainability competencies for a better future. The objectives in the first stage were to identify the primary learning outcomes of the current implementation of ESD in business programmes and design an ESD curriculum for international Chinese college students in Thailand based on the PRME. This involved using SDGs as indicators to examine the ESD learning outcomes in business programmes. An SDG framework was proposed as the foundation of the integration of sustainability into business education. Furthermore, the PRME is taken as the means of developing the curriculum in this study due to having the same objectives as ESD. A web-based content analysis was used to reform the current business programme curriculum.

The objective in the second stage was to design an intervention based on a PRME-based ESD curriculum in order to determine of it could effectively enhance international Chinese college students' sustainability learning outcomes.

A quasi-experiment was conducted in a brand management course in a private university in Bangkok, Thailand, with 96 participants (46 in the EG, 50 in the CG) to examine the effectiveness of the intervention. The researcher was responsible for the implementation of the quasi-experimental research in this study. The measurement of a questionnaire, test of knowledge of sustainability, project performance and interviews were applied to collect and analyse the data. The significance of the findings was concluded by the implementation of the above procedures, as explained below.

SDGs set specific learning objectives for promoting ESD (Rieckmann, 2017), which are useful indicators for HEIs that wish to integrate sustainability in their business programme. It was proposed in this study that this involves taking four steps, the first of which entails examining the advantages and cultural context of the programme. The second involves exploring the local need as an anchor for the development of regional sustainability (European Commission, 2011), and the third entails redefining the programme's mission to embed the concept of sustainability based on the results of the first two steps. The fourth step involves applying the learning objectives of the SDGs framework to the curriculum and identifying the main goals according to the programme's mission. The conduction of SDGs in the business programme should connect with the SDGs learning objective explicitly to provide the direction for teaching and learning practice and better identify the value created.

The six PRME principles are the components of the design of sustainability-orientated curriculum themes in business education. The nature of the PRME principles is to reform business education (Forray & Leigh, 2012). These principles not only have the same purposes as SDGs, but they are also directly connected to the notion of business management and responsible leadership. According

to the PRME (2020a), business students should be equipped with SD skills and the awareness of SDGs in order for them to become future leaders. HEIs can deliver effective practice based on the inclusion of six principles in the curriculum (PRME, 2020b). Hence, the six principles of the PRME can be used to design themes in a sustainability-orientated curriculum of business education. In terms of students' sustainability learning outcomes, self-value and self-interest are the factors that influence students' sustainable action and learning outcomes. Self-value needs to be highlighted in the curriculum due to its influence on students' motivation to take SD action. Self-value must be delivered so that the students will realise that their personal behaviour and contribution are crucial to progress SD. It is suggested in this study that self-value can be emphasised by approaches such as reflective observation, peer-to-peer discussions and self-assessment. Furthermore, a lack of connection between self-interest and sustainability will have a negative impact on students' sustainability learning outcomes. Self-interest is related to the benefits students can gain from being devoted to SD, which can be emphasised by the delivery of content in relation to monetary benefit and the quality of life in the future.

6.2 Implications

The implications of this study are discussed in two dimensions: curriculum development in business education and students' sustainability learning outcomes.

6.2.1 Theoretical implication

ESD progress is with the purpose of SDGs, which drive the movement of curriculum development in business education. The notion of sustainability can be

delivered through the connection of SDGs and business education. However, the addressing of all SDGs (17 SDGs with 169 targets) may cause the issue of losing the focus on what is the role of business in the SD future. Hence, building the foundation of sustainability objectives in business education is needed for curriculum development. Therefore, this study proposed an SDGs framework to be the foundation of the integration of sustainability into business education (see Section 2.2.2). This framework is based on a small group of SDGs 8, 9, 10, 11, 12 and 17 due to their essential relevance to business. It can be regarded as an appropriate tool to examine ESD learning outcomes and the development of the curriculum in business programmes. The mapping of ESD learning outcomes via the use of the SDGs framework in a business programme is further demonstrated in this study to provide an overview of the curriculum structure.

The second implication derived from the experimental results of this study is that self-interest is the factor that most influences students' sustainability learning outcomes. The definition of self-interest is moving from the idea of gain-maximising behaviour to living a good life (Kaplan, 2000). A good life can refer to healthier lifestyles and sustainable consumption, which can assist the shift of individuals' behaviour toward sustainability (Marchand et al., 2010). However, Green (2015) indicated in a study that some university economic courses are still based on self-interest and gain-maximising behaviour. Therefore, it is proposed in this study that there is a gap in applying the factor of self-interest with the definition of living a good life to cultivate students' sustainability learning outcomes in business programmes.

6.2.2 Practical implication

The six PRME principles and SDG learning objectives are included in this study in order to emphasise the importance of developing the curriculum. The inclusion of PRME demonstrates the awareness of global citizenship and further provides a direct connection to business management in terms of economic value and responsibility. The design of this PRME-based ESD curriculum can be a reference for HEIs that wish to embed the concept of sustainability in their business programme to enhance students' awareness of sustainability and related actions. The five topics proposed in this study can generally be applied in courses in the business and management field.

The first topic is ERS (ethics, responsibility and sustainability) in business. The purpose of this topic is to redefine the nature of business to enable students to understand that ERS is the basis of business. The second is shareholders and stakeholders. The shareholder and stakeholder theories can be applied to a discussion of the change of enterprises' vision and objectives after the students have realised the crucial role of ERS in business. The third is SDGs in the local context, and the purpose of highlighting this topic is to deliver the content from the perspective of students' life experience. Understanding SDGs in the local context, such as culture, life experience and social location, will have a positive effect on students' sustainability learning outcomes (Aikens et al., 2016; Dlouhá et al., 2017). Meanwhile, the university plays the role of local anchor to promote SDGs, and the local circumstances also affect the implementation model to achieve them. The fourth topic is the real business world, which has the purpose of pointing out the issues of business today as it shifts toward sustainability from an industry perspective, which will have the benefit of increasing the correlation between sustainability and students' major.

The fifth topic is connecting ideas for a social purpose with SDGs. Social purpose is an approach based on enterprises' growing interest in contributing to society and the competitive advantage derived from that contribution (Rodríguez-Vilá & Bharadwaj, 2017). Rodríguez-Vilá and Bharadwaj (2017) proposed a framework to assist enterprises to find a core social purpose based on their business activities. This approach corresponds with the concept of redefining the nature of business in this study. The nature of businesses' activity should be to create a better economy, society or environment in the future. In other words, every business activity should be developed based on a core vision of a social purpose. The students in this study were required to find a social purpose and then connect it with SDGs to rebuild the vision of the enterprise, thereby enabling them to practice the concept of redefining the nature of business.

6.3 Limitations of the study

The main limitation of this study was the short period of collaboration of the guest lecturers from industry. Despite the insight of sustainability, they provided in the business cases, their involvement in the course design was limited by the short-term collaboration, and collaboration with stakeholders is the most effective way to develop the teaching contents because it can reveal the topics of a hidden curriculum. Borglund et al. (2019) divided the collaboration of external experts into four roles: guest lecturers, planners, co-operators and co-educators. The collaboration with these four roles is focused on the different purposes for the design and development of the course. Therefore, it is suggested that future course design should include a plan based on the

four roles of external experts to effectively discover more content of a hidden curriculum.

Moreover, there was no plan in the business programme for tracking the students' sustainability learning outcomes; instead, they were based on experimental data collected over a period of two months. However, considering that the notion of sustainability was the objective of this business programme, there should have been a tracking process to assess the students' sustainability learning outcomes every year to obtain a holistic picture of their sustainability competencies. The tracking process could include students' extra-curricular activities and internship performance. The students' personal interest in SD could be tracked based on their actions and participation in extra-curricular activities. Furthermore, the business programme could investigate the evaluation of students' internship performance based on the metrics of sustainability competencies.

Besides, the interaction between students' learning outcomes and the environments shall also be considered. Learning environmental factors such as respect for diversity and empowerment influenced international students' learning engagement (Tian et al., 2020). A positive learning engagement can enhance students' learning outcomes (Kuh, 2003). Considering the target group in this study is international Chinese students who learning abroad in Thailand, the learning environmental factors should also be examined the influences on students' learning outcomes via exploring the pedagogy implementation.

6.4 Future research

Two points can be suggested for future research on the design of an ESD curriculum for cultivating students' sustainability learning outcomes. The first involves a long-term collaboration with industry guest lecturers or organisations to develop the course themes. Hategan and Hategan (2021) proposed a coaching process for developing sustainable leadership in business education. One of the main objectives of this process is to educate students to achieve company goals in terms of their attitude, behaviour and company indicators. Consistent with this concept, educators can investigate company goals by concept mapping to extract the corporate foresight of the company and apply it in the development of the ESD course. Corporate foresight concerns moving actions for the future (Jokinen et al., 2022), which can be an approach to use in the context of sustainability for developing SD ideas and practices (Jokinen et al., 2022). Moreover, collaboration with industry can narrow the gap between industrial needs and business education, as well as fulfil the students' personal development, such as employability.

Secondly, according to the findings of this study, self-interest is a factor that affects students' sustainability learning outcomes. On the contrary, Massari et al., (2021) found that empathy and empathic mechanisms are the means to deliver effective sustainability teaching. They maintained that training students' empathic behaviour is the key objective of HEIs when teaching sustainability. Therefore, the second suggestion for future research in this field is to compare the influence of self-interest, empathy and empathic mechanisms on the teaching and learning of ESD.

REFERENCES

Abdelgaffar, H. A. (2021). A critical investigation of PRME integration practices of the third cycle champion group. *The International Journal of Management Education*, *19*(1), Article e100457. https://doi.org/10.1016/j.ijme.2021.100457

Agan, Y., Acar, M. F., & Borodin, A. (2013). Drivers of environmental processes and their impact on performance: a study of Turkish SMEs. *Journal of cleaner production*, *51*, 23-33. http://dx.doi.org/10.1016/j.jclepro.2012.12.043

Agbedahin, A. V. (2019). Sustainable development, Education for Sustainable Development, and the 2030 Agenda for Sustainable Development: Emergence, efficacy, eminence, and future. *Sustainable Development*, *27*(4), 669-680. https://doi.org/10.1002/sd.1931

Aikens, K., McKenzie, M., & Vaughter, P. (2016). Environmental and sustainability education policy research: A systematic review of methodological and thematic trends. *Environmental Education Research*, *22*(3), 333–359. https://doi.org/10.1080/13504622.2015.1135418

Amaral, L. P., Martins, N., & Gouveia, J. B. (2015). Quest for a sustainable university: a review. *International Journal of Sustainability in Higher Education*, *16*(2), 155-172, https://doi.org/10.1108/IJSHE-02-2013-0017

Anderson, L. W., & Krathwohl, D. R. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. Longman. https://www.jstor.org/stable/42926529

Archambault, S. G., & Masunaga, J. (2015). Curriculum mapping as a strategic planning tool. *Journal of Library Administration*, *55*(6), 503-519. https://doi.org/10.1080/01930826.2015.1054770

Arruda Filho, N.d.P., Hino, M.C. & Przybylowicz Beuter, B.S. (2019). Including SDGs in the education of globally responsible leaders. *International Journal of Sustainability in Higher Education*, *20*(5), 856-870. https://doi.org/10.1108/IJSHE-01-2019-0032

Atmaca, A. C., Kiray, S. A., & Pehlivan, M. (2019). Development of a measurement tool for sustainable development awareness. *International Journal of Assessment Tools in Education*, *6*(1), 80-91. https://dx.doi.org/10.21449/ijate.518099

Barbier, E. B. (1987). The concept of sustainable economic development. *Environmental conservation*, *14*(2), 101-110. https://www.jstor.org/stable/44519759

Bartlett, P. W., Popov, M., & Ruppert, J. (2020). Integrating Core Sustainability Meta-Competencies and SDGs Across the Silos in Curriculum and Professional Development. In G. Nhamo & V. Mjimba (Eds.), *Sustainable Development Goals and institutions of higher education* (pp. 71-85). Springer. https://doi.org/10.1007/978-3-030-26157-3

Bauer, T. (2017). Ethics, CSR and sustainability in marketing education: A review of curricula and textbooks. In P. M., Flynn, T. K, Tan, & M. Gudić (Eds.), *Redefining success: Integrating sustainability into management education* (pp. 201-214). Routledge. https://doi.org/10.9774/gleaf.9781351268806

Beddewela, E., Warin, C., Hesselden, F., & Coslet, A. (2017). Embedding responsible management education – staff, student and institutional perspectives. *International Journal of Management in Education, 15*(2), 263–279. https://doi.org/10.1016/j.ijme.2017.03.013

Bell, D. V. (2016). Twenty-first century education: Transformative education for sustainability and responsible citizenship. *Journal of Teacher Education for Sustainability*, *18*(1), 48-56. https://doi.org/10.1515/jtes-2016-0004

Bernard, H. R., Wutich, A., & Ryan, G. W. (2016). *Analyzing qualitative data: Systematic approaches* (2 ed.). SAGE publications. https://www.ebooks.com/en-us/book/2648440/analyzing-qualitative-data/h-russell-bernard/

Beynaghi, A., Trencher, G., Moztarzadeh, F., Mozafari, M., Maknoon, R., & Leal Filho, W. (2016). Future sustainability scenarios for universities: Moving beyond the United Nations Decade of Education for Sustainable Development. *Journal of Cleaner Production, 112*, 3464–3478. https://doi.org/10.1016/j.jclepro.2015.10.117

Bissex, G. (1986). On becoming teacher experts: What's a teacher-researcher?. *Language Arts, 63*(5), 482-484. http://www.jstor.org/stable/41405647

Bjørnskov, C., & Foss, N. J. (2016). Institutions, entrepreneurship, and economic growth: what do we know and what do we still need to know? *Academy of Management Perspectives, 30*(3), 292-315. https://doi.org/10.5465/amp.2015.0135

Blasco, M. (2012). Aligning the hidden curriculum of management education with PRME: An inquiry-based framework. *Journal of Management Education*, *36*(3), 364-388. https://doi.org/10.1177/1052562911420213

Borges, J. C., Ferreira, T. C., de Oliveira, M. S. B., Macini, N., & Caldana, A. C. F. (2017). Hidden curriculum in student organizations: Learning, practice, socialization and responsible management in a business school. *The International Journal of Management Education*, *15*(2), 153-161. http://dx.doi.org/10.1016/j.ijme.2017.03.003

Borglund, T., Prenkert, F., Frostenson, M., Helin, S., & Du Rietz, S. (2019). External facilitators as 'Legitimizers' in designing a master's program in sustainable business at a Swedish business school–A typology of industry collaborator roles in RME. *The International Journal of Management Education*, *17*(3), Article e100315. https://doi.org/10.1016/j.ijme.2019.100315

Boström, G. O., Winka, K., & Boström, K. W. (2021). Extra-curricular activities as a way of teaching sustainability. In W. Leal Filho, A. L. Salvia, & F. Frankenberger (Eds.), *Handbook on teaching and learning for sustainable development* (pp. 323-334). Edward Elgar. https://doi.org/10.4337/9781839104657

Bowen, H. R. (with Bowen, P.G.). (2013). *Social responsibilities of the businessman* (1st ed.). University of Iowa Press. (Original work published 1953).

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77-101. http://dx.doi.org/10.1191/1478088706qp063oa

Breuer, A., Leininger, J., & Tosun, J. (2019). *Integrated policymaking: Choosing an institutional design for implementing the Sustainable Development Goals (SDGs)* (Discussion Paper No. 14/2019). Deutsches Institut für Entwicklungspolitik (DIE), Bonn. http://dx.doi.org/10.23661/dp14.2019

Briggs, S. J., Robinson, Z. P., Hadley, R. L., & Pedersen, R. L. (2019). The importance of university, students and students' union partnerships in student-led projects. *International Journal of Sustainability in Higher Education*, *20*(8), 1409-1427. https://doi.org/10.1108/IJSHE-01-2019-0050

Brundtland Commission (1987). *Report of the World Commission on Environment and Development: Our Common Future*. United Nations. https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf

Buckler, C., & Creech, H. (2014). *Shaping the future we want: UN decade of education for sustainable development; final report.* UNESCO. https://sustainabledevelopment.un.org/index.php?page=view&type=400&nr=1682&menu=35

Buono, A. F. (2017). Beyond the classroom: Embedding responsible management principles, practices, and possibilities in our business schools. In P. M., Flynn, T. K, Tan, & M. Gudić (Eds.), *Redefining success: Integrating sustainability into management education* (pp. 58-70). Routledge. https://doi.org/10.9774/gleaf.9781351268806

Burkholder, K. C., Devereaux, J., Grady, C., Solitro, M., & Mooney, S. M. (2017). Longitudinal study of the impacts of a climate change curriculum on undergraduate student learning: Initial results. *Sustainability*, *9*(6), 913. https://doi.org/10.3390/su9060913

Caniglia, G., John, B., Bellina, L., Lang, D. J., Wiek, A., Cohmer, S., & Laubichler, M. D. (2018). The glocal curriculum: A model for transnational collaboration in higher education for sustainable development. *Journal of Cleaner Production, 171*, 368–376. https://doi.org/10.1016/j.jclepro.2017.09.207

Cantele, S., & Zardini, A. (2020). What drives small and medium enterprises towards sustainability? Role of interactions between pressures, barriers, and benefits. *Corporate Social Responsibility and Environmental Management*, *27*(1), 126-136. https://doi.org/ 10.1002/csr.1778

Carayannis, E. G., Barth, T. D., & Campbell, D. F. (2012). The Quintuple Helix innovation model: global warming as a challenge and driver for innovation. *Journal of innovation and entrepreneurship*, *1*(1), 1-12. https://doi.org/10.1186/2192-5372-1-2

Carayannis, E. G., & Campbell, D. F. (2012). *Mode 3 knowledge production in quadruple helix innovation systems*. Springer. https://www.springer.com/gp/book/9781461420613

Carmines, E. G., & Zeller, R. A. (1979). *Reliability and validity assessment*. Sage publications. https://dx.doi.org/10.4135/9781412985642

Carruthers, S., Kakkar, M., Davidson, C., & Fox, L. (2017). Canadian academic uptake of the PRME. In P. M., Flynn, T. K, Tan, & M. Gudić (Eds.), *Redefining success: Integrating sustainability into management education* (pp. 161-178). Routledge. https://doi.org/10.9774/gleaf.9781351268806

Chaleta, E., Saraiva, M., Leal, F., Fialho, I., & Borralho, A. (2021). Higher Education and Sustainable Development Goals (SDG)—Potential Contribution of the Undergraduate Courses of the School of Social Sciences of the University of Évora. *Sustainability*, *13*(4), 1828. https://doi.org/10.3390/su13041828

Chase, C. I. (1978). *Measurement for educational evaluation* (2nd ed.). Addison-Wesley. https://books.google.co.th/books/about/Measurement_for_Educational_Evaluation.html?id=jFcKgKzZWe8C&redir_esc=y

Chen, J., 2020. Environmental Education, Knowledge and Awareness in China: A Case of Xiamen University Students. *ASIANetwork Exchange: A Journal for Asian Studies in the Liberal Arts*, 27(1), pp.54–72. http://doi.org/10.16995/ane.298

Chen, M. H., Wu, Y. J., & Tsai, K. M. (2018). Building an industry-oriented business sustainability curriculum in higher education. *Sustainability*, *10*(12), 4698. https://doi.org/10.3390/su10124698

Chen, P., Chang, Y., & You, X. (2020). *Development of Problem Solving Confidence to Chinese International Graduate Students of Educational Management in Thailand by using Active Learning* [Coference presentation]. Bangkok, Thailand. The 2nd China-ASEAN International Conference 2020 & The 2nd International Conference on Tourism, Business, & Social Sciences 2020 - Insight to China and ASEAN's Wellness, Tourism, & Innovation. https://doi.org/10.6947/caicictbs.202004.0031.

Chen, P., Tolmie, A., & Wang, H. (2017). Growing the critical thinking of schoolchildren in Taiwan using the Analects of Confucius. *International Journal of Educational Research*, *84*, 43-54. https://doi.org/10.1016/j.ijer.2017.02.002

Chiou, H. (2009). *Quantitative research and statistical analysis: SPSS Chinese Windows version of the data analysis example of parsing*. Chongqing University Press.http://www.cqup.com.cn/index.php?q=9787562448211&m=search&c=index&a=search&siteid=1

Christ, K. L., & Burritt, R. L. (2019). Implementation of sustainable development goals: The role for business academics. *Australian Journal of Management*, *44*(4), 571-593. https://doi.org/10.1177/0312896219870575

Chulalongkorn University. (2020-2021). *Sustainability report*. Chulalongkorn University.http://www.sustainability.chula.ac.th/media/CU_SD_Report2020_21.pdf

Cicmil, S., Gough, G., & Hills, S. (2017). Insights into responsible education for sustainable development: The case of UWE, Bristol. *The International Journal of Management Education*, *15*(2), 293-305. https://doi.org/10.1016/j.ijme.2017.03.002

Cifuentes-Faura, J., Faura-Martínez, U., & Lafuente-Lechuga, M. (2020). Assessment of sustainable development in secondary school economics students according to gender. *Sustainability*, *12*(13), Article e5353. https://doi.org/10.3390/su12135353

Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and psychological measurement*, *20*(1), 37-46. https://doi.org/10.1177/001316446002000104

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. (2nd ed.). Routledge. https://doi.org/10.4324/9780203771587

Cronbach, L. J. (1990). *Essentials of Psychological Testing*. (5th ed.). Harper & Row. https://www.scribd.com/document/454884152/Cronbach-1990-Essentials-of-Psychological-Testing-pdf

Copenhagen Business School (2019). *Responsible management report*. https://d30mzt1bxg5llt.cloudfront.net/public/uploads/sip-reports/CBSPRMESIPReport2019.pdf

Corcoran, P. B., Walker, K. E., & Wals, A. E. (2004). Case studies, make-your-case studies, and case stories: a critique of case-study methodology in sustainability in higher education. *Environmental Education Research*, *10*(1), 7-21. https://doi.org/10.1080/1350462032000173670

Crittenden, V. L., & Wilson, E. J. (2006). Content, pedagogy, and learning outcomes in the international marketing course. *Journal of Teaching in International Business*, *17*(1-2), 81-101. https://doi.org/10.1300/J066v17n01_05

D'Alonzo, K. T. (2004). The Johnson-Neyman procedure as an alternative to ANCOVA. *Western Journal of Nursing Research*, *26*(7), 804-812. https://doi.org/10.1177/0193945904266733.

da Silva Junior, A., de Oliveira Martins-Silva, P., de Araújo Vasconcelos, K. C., da Silva, V. C., de Brito, S. L. M. S., & Monteiro, J. M. R. (2019). Sustainability and corporate social responsibility in the opinion of undergraduate students in management programs: Between the concrete and the abstract. *Journal of Cleaner Production*, *207*, 600-617. https://doi.org/10.1016/j.jclepro.2018.10.011

Deakin University. (2017-2018). *Sharing Information on Progress. Faculty of business and law, Deakin university*. Faculty of Business and Law, Deakin University. https://blogs.deakin.edu.au/prme/wp-content/uploads/sites/212/2021/02/DBS-PRME-SIP-Report2017-18.pdf

de Assumpção, M. R., & Neto, M. P. M. (2020). State-of-the-art practices being reported by the PRME champions group: A reference to advance education for sustainable development. *The International Journal of Management Education*, *18*(2), 100369. https://doi.org/10.1016/j.ijme.2020.100369

De Dominicis, S., Schultz, P. W., & Bonaiuto, M. (2017). Protecting the environment for self-interested reasons: Altruism is not the only pathway to sustainability. *Frontiers in Psychology*, *8*, Article e1065. https://doi.org/10.3389/fpsyg.2017.01065

de Paula Arruda Filho, N. (2017). The agenda 2030 for responsible management education: An applied methodology. *The International Journal of Management Education*, *15*(2), 183-191. https://doi.org/10.1016/j.ijme.2017.02.010

DESA. (2020, July 7). News. *United Nations*. https://www.un.org/development/desa/en/news/sustainable/sustainable-development-goals-report-2020.htm

Dharmapiya, P. & Saratun, M. (2016). Cultivating a sufficiency mindset in Thai schools. In G.C., Avery & H. Bergsteiner (Eds.), *Sufficiency Thinking: Thailand's Gift to an Unsustainable World* (pp. 129-149). Routledge. http://www.tsdf.nida.ac.th/elctfl/articlefile/article-file-10590.pdf

Dlouhá, J., Glavič, P., & Barton, A. (2017). Higher education in Central European countries – Critical factors for sustainability transition. *Journal of Cleaner Production*, *151*, 670–684. https://doi.org/10.1016/j.jclepro.2016.08.022

Dmochowski, J. E., Garofalo, D., Fisher, S., Greene, A., & Gambogi, D. (2016). Integrating sustainability across the university curriculum. *International Journal of Sustainability in Higher Education*, *17*(5), 652-670. http://dx.doi.org/10.1108/IJSHE-10-2014-0154

Doane, D. (2005). *The Myth of CSR*. Stanford Social Innovation Review. https://ssir.org/articles/entry/the_myth_of_csr

Dowd, L. (2016, July 29). SDGs: the 3 most popular goals for business. *Reuters Events*. https://www.reutersevents.com/sustainability/sdgs-3-most-popular-goals-business

Dunn G. (2004). *Statistical evaluation of measurement errors: design and analysis of reliability studies.* (2nd ed.). Hodder Education. https://www.worldcat.org/title/statistical-evaluation-of-measurement-errors-design-and-analysis-of-reliability-studies/oclc/56653727

Eizaguirre, A., García-Feijoo, M., & Laka, J. P. (2019). Defining sustainability core competencies in business and management studies based on multinational stakeholders' perceptions. *Sustainability*, *11*(8), 2303. https://doi.org/10.3390/su11082303

Ekström, M. (2020). Building a more sustainable business realm through education. In K. Nikula, S. Sarlio-Siintola, & V. Kallunki (Eds.), *Ethics as a resource. Examples of RDI projects and educational development*. Laurea Publications. https://www.theseus.fi/bitstream/handle/10024/346440/Laurea%20julkaisut%20144.pdf?sequence=5&isAllowed=y

Escudero, M., Csuri, M., Alcaraz, J. M., Goldberg, E. S., Guevara, R., Howaidy, G., Martell, J., Yong-Seung Park, S., Parkes, C., & Weybrecht, G. (2015). *Transformational model for PRME implementation.* PRME. https://d30mzt1bxg5llt.cloudfront.net/public/uploads/PDFs/PRMETransformationalWeb.pdf

European Commission (2011). *Connecting Universities to Regional Growth: A Practical Guide*. European Union. https://ec.europa.eu/regional_policy/sources/docgener/presenta/universities2011/universities2011_en.pdf

Evans, N. (2010). *Social-ecological resilience through education for sustainability: A case study of community scale resilience* [Unpublished doctoral dissertation]. James Cook University. https://researchonline.jcu.edu.au/19006/

Farrag, D. A., & Obeidat, S. (2020). Integrating Sustainability and CSR Concepts in the College of Business & Economics (CBE) Curriculum: An experiential learning approach. In N. El-Bassiouny, D. El-Bassiouny, E. K. Mohamed, & M. A. Basuony (Eds.), *Ethics, CSR and Sustainability (ECSRS) Education in the Middle East and North Africa (MENA) Region* (1st ed., pp. 127-144). Routledge. https://www.routledge.com/Ethics-CSR-and-Sustainability-ECSRS-Education-in-the-Middle-East-and/El-Bassiouny-El-Bassiouny-Mohamed-Basuony/p/book/9780367901257

Fathalizadeh, A., Hosseini, M. R., Vaezzadeh, S. S., Edwards, D. J., Martek, I., & Shooshtarian, S. (2021). Barriers to sustainable construction project management: the case of Iran. *Smart and Sustainable Built Environment*, ahead-of-print. https://doi.org/10.1108/SASBE-09-2020-0132

Fissi, S., Romolini, A., Gori, E., & Contri, M. (2021). The path toward a sustainable green university: The case of the University of Florence. *Journal of Cleaner Production*, *279*, Article e123655. https://doi.org/10.1016/j.jclepro.2020.123655

Fornes, G., Monfort, A., Ilie, C., Koo, C. K. T., & Cardoza, G. (2019). Ethics, Responsibility, and Sustainability in MBAs. Understanding the motivations for the incorporation of ERS in less traditional markets. *Sustainability*, *11*(24), Article e7060. https://doi.org/10.3390/su11247060

Forray, J. M., & Leigh, J. S. (2012). A primer on the principles of responsible management education: Intellectual roots and waves of change. *Journal of Management Education*, *36*(3), 295-309. https://doi.org/10.1177/105256291143303

Fowler Jr, F. J. (2013). *Survey research methods* (5th digital ed.). Sage publications. https://us.sagepub.com/en-us/nam/book/survey-research-methods-4

Freeman, R. E. (2010). *Strategic management: A stakeholder approach (digital ed.).* Cambridge university press. https://www.cambridge.org/9780521151740

French, S. (2015). *The benefits and challenges of modular higher education curricula.* Melbourne Centre for the Study of Higher Education. https://melbourne-cshe.unimelb.edu.au/__data/assets/pdf_file/0006/2774391/Benefits_Challenges_Modular_Higher_Ed_Curricula_SFrench_v3-green-2.pdf

Furco, A. (2015). *eService-learning: Creating experiential learning and civic engagement through online and hybrid courses (J. Strait & K. J. Nordyke, Eds.).* Stylus Publishing, LLC. https://styluspub.presswarehouse.com/browse/book/9781620360644/eService-Learning

Gajjar, S., Sharma, R., Kumar, P., & Rana, M. (2014). Item and test analysis to identify quality multiple choice questions (MCQs) from an assessment of medical students of Ahmedabad, Gujarat. *Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine*, *39*(1), 17. https://doi.org/10.4103/0970-0218.126347

García-Feijoo, M., Eizaguirre, A., & Rica-Aspiunza, A. (2020). Systematic review of sustainable-development-goal deployment in business schools. *Sustainability*, *12*(1), 440. https://doi.org/10.3390/su12010440

Geels, F. W., Turnheim, B., Asquith, M., Kern, F., & Kivimaa, P. (2019). *Sustainability transitions: policy and practice.* European Environmental Agency. https://www.eea.europa.eu/publications/sustainability-transitions-policy-and-practice

Gentile, M. C. (2017). Giving voice to values: A global partnership with UNGC PRME to transform management education. *The International Journal of Management Education*, *15*(2), 121-125. https://doi.org/10.1016/j.ijme.2017.02.004

George Mason University School of Business (2013-2014). *PRME Sharing Information on Progress Report.* https://d30mzt1bxg5llt.cloudfront.net/public/uploads/sip-reports/PRMEGMUBUSReport.pdf

Giacalone, R. A., & Wargo, D. T. (2009). The roots of the global financial crisis are in our business schools. *Journal of Business Ethics Education*, *6*, 147-168. https://www.pdcnet.org/jbee/content/jbee_2009_0006_0147_0168

Glasgow Caledonian University (2018). *Sharing Information on Progress*. https://d30mzt1bxg5llt.cloudfront.net/public/uploads/sipreports/PRMESIPElectronicAugust21stSPREADS.pdf

Gosling, D., & Moon, J. (2002). *How to use Learning Outcomes and Assessment Criteria* (3rd digital ed.). SEEC Office. https://aec-music.eu/userfiles/File/goslingmoon-learningoutcomesassessmentcriteria.pdf

Gottardello, D., & Pàmies, M. D. M. (2019). Business school professors' perception of ethics in education in Europe. *Sustainability*, *11*(3), 608. https://doi.org/10.3390/su11030608

Gough, G., Cicmil, S., & Longhurst, J. (2015, June 29). *Utilising the ESD agenda to institutionalise PRME: A case study of the University of the West of England, Bristol* [Conference presentation]. PRME Regional Chapter Annual Conference, Glasgow, UK. https://uwe-repository.worktribe.com/output/832394

Goworek, H. (2017). Sustainable marketing. In M. Petra (Ed.), *The business student's guide to sustainable management: principles and practice* (2nd ed., pp. 286-315). Routledge. https://doi.org/10.4324/9781351216500

Greenberg, D. N., Deets, S., Erzurumlu, S., Hunt, J., Manwaring, M., Rodgers, V., & Swanson, E. (2017). Signing to living PRME: Learning from a journey towards responsible management education. *The International Journal of Management Education, 15*(2), 205-218. https://doi.org/10.1016/j.ijme.2017.02.007

Green, T. L. (2015). Lecturers' perspectives on how introductory economic courses address sustainability. *International Journal of Sustainability in Higher Education*, *16*(1), 44-56. https://doi.org/10.1108/IJSHE-03-2013-0020

GSDR (2019). *The Future is Now: Science for Achieving Sustainable Development.* United Nations. https://sustainabledevelopment.un.org/gsdr2019#:~:text=The%20Future%20is%20Now%3A%20Science%20for%20Achieving%20Sustainable%20Development%2C%20is,the%20United%20Nations%20Secretary%2DGeneral.

Guerrero, M., Cunningham, J. A., & Urbano, D. (2015). Economic impact of entrepreneurial universities' activities: An exploratory study of the United Kingdom. *Research Policy*, *44*(3), 748-764. https://doi.org/10.1016/j.respol.2014.10.008

Guterres, A. (2020, March 31). The recovery from the COVID-19 crisis must lead to a different economy. *United Nations*. https://www.un.org/en/un-coronavirus-communications-team/launch-report-socio-economic-impacts-covid-19

Gwartney, P. A. (2007). *The Telephone Interviewer's Handbook: How to conduct standardized conversations*. John Wiley & Sons. https://www.wiley.com/en-us/The+Telephone+Interviewer%27s+Handbook%3A+How+to+Conduct+Standardized+Conversations-p-9780787986384

Haertle, J., Parkes, C., Murray, A., & Hayes, R. (2017). PRME: Building a global movement on responsible management education. *The International Journal of Management Education, 15*(2), 66-72. https://doi.org/10.1016/j.ijme.2017.05.002

Hair, J. F., Black, B., Babin, B. J., & Anderson R.E. (2010). *Multivariate data analysis: global edition* (7th ed.). Person Education. https://www.pearson.com/uk/educators/higher-education-educators/program/Hair-Multivariate-Data-Analysis-Global-Edition-7th-Edition/PGM916641.html

Hammersley, M. (2018). *What's wrong with ethnography?: Methodological explorations* (1st ed.). Routledge. https://www.routledge.com/Routledge-Revivals-Whats-Wrong-With-Ethnography-1992-Methodological/Hammersley/p/book/9781138489363

Hammersley, M. (1993). On the teacher as researcher. *Educational Action Research, 1*(3), 425-445. https://doi.org/10.1080/0965079930010308

Haney, A. B., Pope, J., & Arden, Z. (2020). Making it personal: Developing sustainability leaders in business. *Organization & Environment*, *33*(2), 155-174. https://doi.org/10.1177/1086026618806201

Hartley, K. (2022). Infrastructure and SDG localization: the 21st century mandate. *Environmental Research: Infrastructure and Sustainability, 2*(1), Article e013001. https://doi.org/10.1088/2634-4505/ac442a

Hassan, Z. A., Schattner, P., & Mazza, D. (2006). Doing a pilot study: why is it essential?. *Malaysian family physician: the official journal of the Academy of Family Physicians of Malaysia*, *1*(2-3), 70. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4453116/

Hategan, V. P., & Hategan, C. D. (2021). Sustainable Leadership: Philosophical and Practical Approach in Organizations. *Sustainability*, *13*(14), Article e7918. https://doi.org/10.3390/su13147918

Hay, R., & Eagle, L. (2019). Impact of integrated sustainability content into undergraduate business education. *International Journal of Sustainability in Higher Education*, *21*(1), 131-143. https://doi.org/10.1108/IJSHE-05-2019-0174

Hays, J. M., Pereseina, V., Alshuaibi, A. S. I., & Saha, J. (2020). Lessons in Sustainable Process Paradigm. A case study from Dubai. *The International Journal of Management Education*, *18*(1), Article e100366. https://doi.org/10.1016/j.ijme.2020.100366

Hay, R., & Eagle, L. (2020). Impact of integrated sustainability content into undergraduate business education. *International Journal of Sustainability in Higher Education*, 21(1), 131-143. https://doi.org/10.1108/IJSHE-05-2019-0174

Hazzi, O., & Maldaon, I. (2015). A pilot study: Vital methodological issues. *Business: Theory and Practice*, *16*(1), 53-62. https://doi.org/10.3846/btp.2015.437

Henderson, L. H., Wersun, A., Wilson, J., Yeung, S. M. C., & Zhang, K. (2019). Principles for responsible management education in 2068. *Futures*, *111*, 81-89. https://doi.org/10.1016/j.futures.2019.05.005

Hennink, M., & Kaiser, B. N. (2021). Sample sizes for saturation in qualitative research: A systematic review of empirical tests. *Social Science & Medicine*, Article e114523. https://doi.org/10.1016/j.socscimed.2021.114523

Hensley, N. (2020). Educating for sustainable development: Cultivating creativity through mindfulness. *Journal of Cleaner Production*, *243*, Article e118542. https://doi.org/10.1016/j.jclepro.2019.118542

Hermann, R. R., & Bossle, M. B. (2020). Bringing an entrepreneurial focus to sustainability education: A teaching framework based on content analysis. *Journal of Cleaner Production*, *246*, Article e119038. https://doi.org/10.1016/j.jclepro.2019.119038

Hernandez-Lopez, L. E., Alamo-Vera, F. R., Ballesteros-Rodriguez, J. L., & De Saa-Perez, P. (2020). Socialization of business students in ethical issues: The role of individuals' attitude and institutional factors. *The International Journal of Management Education, 18*(1), Article e100363. https://doi.org/10.1016/j.ijme.2020.100363

Høgdal, C., Rasche, A., Schoeneborn, D., & Scotti, L. (2021). Exploring Student Perceptions of the Hidden Curriculum in Responsible Management Education. *Journal of Business Ethics, 168*(1), 173-193. https://doi.org/10.1007/s10551-019-04221-9

Hong, W. (2020). Build it and they will come: The faculty learning community approach to infusing the curriculum with sustainability content. In G. Nhamo & V. Mjimba (Eds.), *Sustainable Development Goals and institutions of higher education* (pp. 49-60). Springer. https://doi.org/10.1007/978-3-030-26157-3

Hope, A. (2017). The PRME Curriculum Tree: A Framework for Responsible Management. In P. M., Flynn, T. K, Tan, & M. Gudić (Eds.), *Redefining success: Integrating sustainability into management education* (pp. 58-70). Routledge. https://doi.org/10.9774/gleaf.9781351268806

Horlings, L. (2016). Connecting people to place: Sustainable place-shaping practices as transformative power. *Current Opinion in Environmental Sustainability, 20*, 32-40. https://doi.org/10.1016/j.cosust.2016.05.003

Howlett, C., Ferreira, J.-A., & Blomfield, J. (2016). Teaching sustainable development in higher education: Building critical, reflective thinkers through an interdisciplinary approach. *International Journal of Sustainability in Higher Education*, *17*(3), 305–321. https://doi.org/10.1108/IJSHE-07-2014-0102

ICEF. (2019, February 27). *Thai universities working to attract more Chinese students.* https://monitor.icef.com/2019/02/thai-universities-working-to-attract-more-chinese-students/

Igwe, P. A., Okolie, U. C., & Nwokoro, C. V. (2019). Towards a responsible entrepreneurship education and the future of the workforce. *The International Journal of Management Education*, Article e100300. https://doi.org/10.1016/j.ijme.2019.05.001

ILO. (2018). *World Employment and Social Outlook 2018: Greening with jobs.* International labour organization. https://www.ilo.org/global/publications/books/WCMS_628654/lang--en/index.htm

ILO. (2019). *Skills for a greener future: a global view.* International labour organization. https://www.ilo.org/skills/pubs/WCMS_732214/lang--en/index.htm

Ionescu, G. H., Firoiu, D., Pîrvu, R., Enescu, M., Rădoi, M. I., & Cojocaru, T. M. (2020). The potential for innovation and entrepreneurship in EU countries in the context of sustainable development. *Sustainability*, *12*(18), Article e7250. https://doi.org/10.3390/su12187250

ISO. (2020). *UN Sustainable development goals- can ISO standards help? Yes!*. International Organization for Standardization. https://committee.iso.org/sites/tc207sc1/home/projects/ongoing/supporting-environmental-and-bus/un-sustainable-development-goals.html

Iyengar, R., & Bajaj, M. (2011). After the Smoke Clears: Toward Education for Sustainable Development in Bhopal, India. *Comparative Education Review*, *55*(3), 424–456. https://doi.org/10.1086/660680

Jampaklay, A., Penboon, B., & Lucktong, A. (2022). Internationalization of higher education in Thailand: Promises and reality. *Kasetsart Journal of Social Sciences*, *43*(1), 183-193. https://doi.org/10.34044/j.kjss.2022.43.1.25

Janmaimool, P., & Chontanawat, J. (2021). Do University Students Base Decisions to Engage in Sustainable Energy Behaviors on Affective or Cognitive Attitudes?. *Sustainability*, *13*(19), Article e10883. https://doi.org/10.3390/su131910883

Junior, J. A. G., Busso, C. M., Gobbo, S. C. O., & Carreão, H. (2018). Making the links among environmental protection, process safety, and industry 4.0. *Process safety and environmental protection*, *117*, 372-382. https://doi.org/10.1016/j.psep.2018.05.017

Kaye, C. B. (2010). *The complete guide to service learning: Proven, practical ways to engage students in civic responsibility, academic curriculum, & social action* (2nd ed.). Free Spirit Publishing. https://www.freespirit.com/character-education-leadership-and-service-learning/complete-guide-to-service-learning-cathryn-berger-kaye/

Kaplan, S. (2000). New ways to promote proenvironmental behavior: Human nature and environmentally responsible behavior. *Journal of social issues*, *56*(3), 491-508. https://doi.org/10.1111/0022-4537.00180

Kelley, T. L. (1939). The selection of upper and lower groups for the validation of test items. *Journal of Educational Psychology*, *30*(1), 17-24. https://doi.org/10.1037/h0057123

Ketlhoilwe, M. J., Silo, N., & Velempini, K. (2020). Enhancing the roles and responsibilities of higher education institutions in implementing the sustainable development goals. In G. Nhamo & V. Mjimba (Eds.), *Sustainable Development Goals and institutions of higher education* (pp. 121-130). Springer. https://doi.org/10.1007/978-3-030-26157-3

Killian, S., Lannon, J., Murray, L., Avram, G., Giralt, M., & O'Riordan, S. (2019). Social Media for Social Good: Student engagement for the SDGs. The International Journal of Management Education, 17(3), Article e100307. http://doi.org/10.1016/j.ijme.2019.100307

Kioupi, V., & Voulvoulis, N. (2020). Sustainable development goals (SDGs): Assessing the contribution of higher education programmes. *Sustainability*, *12*(17), 6701. https://doi.org/10.3390/su12176701

Király, G., & Géring, Z. (2019). Introduction to 'Futures of Higher Education'special issue. *Futures*, *111*, 123-129. https://doi.org/doi:10.1016/j.futures.2019.03.004

Kirschner, P.A., Sweller, J., & Clark, R.E. (2006). Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching. Educational Psychologist, 41(2), 75-86. https://doi.org/10.1207/s15326985ep4102_1

Koh, H. L., & Teh, S. Y. (2021). Innovations in curriculum and pedagogy in education for sustainable development. In W. Leal Filho, A. L. Salvia, & F. Frankenberger (Eds.), *Handbook on teaching and learning for sustainable development* (pp. 219-237). Edward Elgar. https://doi.org/10.4337/9781839104657

Kolb, D. A. (2014). *Experiential Learning: Experience as the Source of Learning and Development* (2nd digital ed.). Pearson FT Press. https://www.pearson.com/us/higher-education/program/Kolb-Experiential-Learning-Experience-as-the-Source-of-Learning-and-Development-2nd-Edition/PGM183903.html

Kolb, M., Fröhlich, L., & Schmidpeter, R. (2017). Implementing sustainability as the new normal: Responsible management education–From a private business school's perspective. *The International Journal of Management Education, 15*(2), 280-292. https://doi.org/10.1016/j.ijme.2017.03.009

Korhonen-Kurki, K., Koivuranta, R., Kuitto, V., Pietikäinen, J., Schönach, P., & Soini, K. (2020). Towards Realising SDGs in the University of Helsinki. In G. Nhamo & V. Mjimba (Eds.), *Sustainable Development Goals and institutions of higher education* (pp. 15-29). Springer. https://doi.org/10.1007/978-3-030-26157-3

Kricsfalusy, V., George, C., & Reed, M. G. (2018). Integrating problem-and project-based learning opportunities: Assessing outcomes of a field course in environment and sustainability. *Environmental Education Research*, *24*(4), 593-610. https://doi.org/10.1080/13504622.2016.1269874

Krippendorff, K. (2018). *Content analysis: An introduction to its methodology*. SAGE. https://us.sagepub.com/en-us/nam/content-analysis/book258450

Kuh, G. D. (2003). What we're learning about student engagement from NSSE: Benchmarks for effective educational practices. *Change: The magazine of higher learning*, *35*(2), 24-32. https://doi.org/10.1080/00091380309604090

Laasch, O. (2021). *Principles of Management: Practicing Ethics, Responsibility, Sustainability* (2nd ed.). SAGE. https://us.sagepub.com/en-us/nam/principles-of-management/book272405

Laasch O., & Conaway, R. (2014). *Principles of Responsible Management: Glocal Sustainability, Responsibility, Ethics*. Cengage Learning. https://books.google.co.th/books?id=0uLKAgAAQBAJ&printsec=frontcover&dq=Laasch+O.+%26+Conaway,+R.+(2014),+Principles+of+Responsible+Management:+Glocal+Sustainability,+Responsibility,+Ethics.+Cengage+Learning+doi&hl=en&sa=X&ved=2ahUKEwiBtfen6NTyAhUKwzgGHYHwDmsQ6AEwA3oECAgQAg#v=onepage&q&f=false

Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: a practical primer for t-tests and ANOVAs. *Frontiers in psychology*, *4*, 863. https://doi.org/10.3389/fpsyg.2013.00863

Landis, J. Richard, & Koch, Gary G. (1977). The measurement of observer agreement for categorical data. *Biometrics, 33*(1), 159–174. https://doi.org/10.2307/2529310

Landrum, N.E., & Ohsowski, B. (2017). Content trends in sustainable business education: an analysis of introductory courses in the USA. *International Journal of Sustainability in Higher Education, 18*(3), 385-414. https://doi.org/10.1108/IJSHE-07-2016-0135

Lane, A. (2017). Open education and the sustainable development goals: Making change happen. *Journal of Learning for Development, 4*(3), 275-286. http://jl4d.org/index.php/ejl4d/article/view/266

La Trobe Business School (2018-2020). *UN PRME Sharing Information on Progress Report*. https://d30mzt1bxg5llt.cloudfront.net/public/uploads/sip-reports/La-Trobe-Business School_SIP_2020_FINAL_2020-10-30-073634.pdf

Leal Filho, W. (2021). Challenges in sustainability teaching. In W. Leal Filho, A. L. Salvia, & F. Frankenberger (Eds.), *Handbook on teaching and learning for sustainable development* (pp. 350-365). Edward Elgar. https://doi.org/10.4337/9781839104657

Leal Filho, W., Shiel, C., Paço, A., Mifsud, M., Ávila, L. V., Brandli, L. L., Molthan-Hill, P., Pace, P., Azeiteiro, U. M., Vargas, V. R., & Caeiro, S. (2019). Sustainable Development Goals and sustainability teaching at universities: Falling behind or getting ahead of the pack?. *Journal of Cleaner Production*, *232*, 285-294. https://doi.org/10.1016/j.jclepro.2019.05.309

Leicht, A., Heiss, J., & Byun, W. J. (2018). *Issues and trends in education for sustainable development*. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000261445

Lister, T. A. J., & Cameron, R. J. (1986). Curriculum management (part 1): Planning curriculum objectives. *Educational Psychology in Practice*, *2*(1), 6-14. http://dx.doi.org/10.1080/0266736860020103

Loorbach, D. A. (2007). *Transition management*: *New mode of governance for sustainable development.* Erasmus University. http://hdl.handle.net/1765/10200

Loučanová, E., Šupín, M., Čorejová, T., Repková-Štofková, K., Šupínová, M., Štofková, Z., & Olšiaková, M. (2021). Sustainability and Branding: An Integrated Perspective of Eco-innovation and Brand. *Sustainability*, *13*(2), 732. https://doi.org/10.3390/su13020732

Lozano, R. (2010). Diffusion of sustainable development in universities' curricula: an empirical example from Cardiff University. *Journal of Cleaner Production, 18*(7), 637-644. https://doi.org/10.1016/j.jclepro.2009.07.005

Lozano, R., Merrill, M. Y., Sammalisto, K., Ceulemans, K., & Lozano, F. J. (2017). Connecting competences and pedagogical approaches for sustainable development in higher education: A literature review and framework proposal. *Sustainability*, *9*(10), 1889. https://doi.org/10.3390/su9101889

Lynn, M. R. (1986). Determination and quantification of content validity. *Nursing Research, 35*(6), 382–385. https://doi.org/10.1097/00006199-198611000-00017

Maguire, M., & Delahunt, B. (2017). Doing a thematic analysis: A practical, step-by-step guide for learning and teaching scholars. *All Ireland Journal of Higher Education*, *9*(3), 3351-3354. http://ojs.aishe.org/index.php/aishe-j/article/view/3354

Malini Reddy, Y. (2012). Examining the relationship between rubric assessment tools and enhancement of student learning. *International Journal of Management in Education*, *6*(3), 273-293. https://doi.org/10.1504/IJMIE.2012.064324

Marchand, A., Walker, S., & Cooper, T. (2010). Beyond abundance: Self-interest motives for sustainable consumption in relation to product perception and preferences. *Sustainability*, *2*(5), 1431-1447. https://doi.org/10.3390/su2051431

Martínez, F., Herrero, L. C., & De Pablo, S. (2010). Project-based learning and rubrics in the teaching of power supplies and photovoltaic electricity. *IEEE Transactions on Education*, *54*(1), 87-96. https://doi.org/10.1109/TE.2010.2044506

Mather, G., Denby, L., Wood, L. N., & Harrison, B. (2011). Business graduate skills in sustainability. *Journal of Global Responsibility, 2*(2), 188-205. https://doi.org/10.1108/20412561111166049

Mason, J. (2017). *Qualitative researching* (3rd ed). SAGE Publications. https://us.sagepub.com/en-us/nam/qualitative-researching/book244365

Mayring, P. (2014). *Qualitative content analysis: theoretical foundation, basic procedures and software solution*. SSOAR https://nbn-resolving.org/urn:nbn:de:0168-ssoar-395173

Mazon, G., Pereira Ribeiro, J. M., Montenegro de Lima, C. R., Castro, B. C. G., & Guerra, J. B. S. O. D. A. (2020). The promotion of sustainable development in higher education institutions: top-down bottom-up or neither? *International Journal of Sustainability in Higher Education, 21*(7), 1429-1450. https://doi.org/10.1108/IJSHE-02-2020-0061

MBN. (2021). *What is a shareholder? Definition and types.* Market Business News. https://marketbusinessnews.com/financial-glossary/what-is-a-shareholder/

Miyazaki, Y., & Maier, K. S. (2005). Johnson–Neyman Type Technique in Hierarchical Linear Models. *Journal of Educational and Behavioral Statistics, 30*(3), 233-259. https://www.jstor.org/stable/3701378

McDonough, W., & Braungart, M. (2002). *Cradle to cradle: Remaking the way we make things*. North point press. https://doi.org/10.1017/S1466046609990494

McHugh, M. L. (2012). Interrater reliability: the kappa statistic. *Biochemia Medica, 22*(3), 276-282. https://doi.org/10.11613/BM.2012.031

McIntosh, M. J., & Morse, J. M. (2015). Situating and constructing diversity in semi-structured interviews. *Global Qualitative Nursing Research, 2,* 1-12. https://doi.org/10.1177/2333393615597674

McMillan, S. J. (2000). The microscope and the moving target: The challenge of applying content analysis to the World Wide Web. *Journalism & Mass Communication Quarterly, 77*(1), 80-98. https://doi.org/10.1177/107769900007700107

Michalos, A. C., Creech, H., Swayze, N., Kahlke, P. M., Buckler, C., & Rempel, K. (2012). Measuring knowledge, attitudes and behaviours concerning sustainable development among tenth grade students in Manitoba. *Social Indicators Research, 106*(2), 213-238. https://doi.org/10. 1007/sl 1205-01 1-9809-6

Ministry of Education. (2020). *List of national colleges and universities.* The People's Republic of China. http://www.moe.gov.cn/jyb_xxgk/s5743/s5744/202007/t20200709_470937.html

Ministry of Foreign Affairs (2017). *Sufficiency economy philosophy: Thailand's path towards sustainable development goals.* Ministry of Foreign Affairs, Bangkok, Thailand. https://data.thailand.opendevelopmentmekong.net/library_record/sufficiency-economy-philosophy-thailands-path-towards-sustainable-development-goals

Mintz, K., & Tal, T. (2018). The place of content and pedagogy in shaping sustainability learning outcomes in higher education. *Environmental Education Research, 24*(2), 207–229. https://doi.org/10.1080/13504622.2016.1204986

Mohr, M. M. (1994). Teacher-researchers at work. *The English Journal, 83*(6), 19-21. https://www.jstor.org/stable/820256

Molthan-Hill, P., Winfield, F., Baddley, J., & Hill, S. (2017). Work based learning: students solving sustainability challenges through strategic business partnerships. In P. M., Flynn, T. K, Tan, & M. Gudić (Eds.), *Redefining success: Integrating sustainability into management education* (pp. 201-214). Routledge. https://doi.org/10.9774/gleaf.9781351268806

Mongsawad, P. (2012). The philosophy of the sufficiency economy: a contribution to the theory of development. *Asia-Pacific Development Journal*, *17*(1), 123-143. https://doi.org/10.18356/02bd5fb3-en

Moosmayer, D. C., Waddock, S., Wang, L., M. P., Dierksmeier, C., & Gohl, C. (2019). Leaving the road to abilene: A pragmatic approach to addressing the normative paradox of responsible management education. *Journal of Business Ethics*, *157*(4), 913–932. https://doi.org/10.1007/s10551-018-3961-8

Morris, G., & Reid, F. (2020). Making an Impact: Transforming Undergraduate Business Education. In E. Sengupta, P. Blesinger, & C. Mahoney (Eds.), *International Perspectives on Policies, Practices & Pedagogies for Promoting Social Responsibility in Higher Education* (pp. 127-144). Emerald. https://doi.org/10.1108/S2055-3641202032

Muff, K., Kapalka, A., & Dyllick, T. (2017). The Gap Frame-Translating the SDGs into relevant national grand challenges for strategic business opportunities. *The International Journal of Management Education*, *15*(2), 363-383. https://doi.org/10.1016/j.ijme.2017.03.004

Ndou, V., Mele, G., & Del Vecchio, P. (2019). Entrepreneurship education in tourism: An investigation among European Universities. *Journal of Hospitality, Leisure, Sport & Tourism Education*, *25*, Article e100175. https://doi.org/10.1016/j.jhlste.2018.10.003

Ndubuka, N. N., & Rey-Marmonier, E. (2019). Capability approach for realising the Sustainable Development Goals through Responsible Management Education: The case of UK business school academics. *The International Journal of Management Education*, *17*(3), Article e100319. https://doi.org/10.1016/j.ijme.2019.100319

Neuendorf, K. A. (2016). *The Content analysis guidebook* (2nd digital ed.). SAGE. https://us.sagepub.com/en-us/nam/the-content-analysis-guidebook/book234078

Newcastle Business School (2020). *PRME: Sharing Information on Progress Report*. University of Newcastle. https://d30mzt1bxg5llt.cloudfront.net/public/uploads/sipreports/NUBSPRMESIPReportApril2020finalversionforsubmissiontoPRME.pd

Nhamo, G. (2020). Higher education and the energy sustainable development goal: policies and projects from University of South Africa. In G. Nhamo & V. Mjimba (Eds.), *Sustainable Development Goals and institutions of higher education* (pp. 31-48). Springer. https://doi.org/10.1007/978-3-030-26157-3

Nhamo, G., & Mjimba, V. (2020). The context: SDGs and institutions of higher education. In G. Nhamo & V. Mjimba (Eds.), *Sustainable development goals and institutions of higher education* (pp. 1-13). Springer. Springer. https://doi.org/10.1007/978-3-030-26157-3

Nicolai, S., Bhatkal, T, Hoy, C., Aedy, T. (2016). *Projecting progress: The SDGs in Asia and the Pactific*. Overseas Development Institute. https://odi.org/en/publications/projecting-progress-the-sdgs-in-asia-pacific/

Noll, V. H., Scannell, D. P., & Craig, R. C. (1979). *Introduction to educational measurement* (4th ed.). Houghton Mifflin. http://wilmu2.trglib.gov.my/neuseal/Record/0000019009

Nottingham Business School. (2019). *Principles for responsible management education: Sharing information on progress report*. Nottingham Trent University. https://d30mzt1bxg5llt.cloudfront.net/public/uploads/sipreports/OS1474PRMEreport2019SINGLEPAGES.pdf

Nottingham University Business School (2019). *Principles for Responsible Management Education 2019 Sharing Information on Progress report*. University of Nottingham. https://d30mzt1bxg5llt.cloudfront.net/public/uploads/sipreports/NUBSPRMESIPReportJan2019final.pdf

Nooyi, I. K., & Govindarajan, V. (2020, March-April). *Becoming a better corporate citizen*. Harvard Business Review. https://hbr.org/2020/03/becoming-a-better-corporate-citizen

NRCT. (2015). *National policy and guidelines for human research.* https://sp.mahidol.ac.th/pdf/ref/National_Policy_Guidelines_for_Human_Research2015.pdf

Nuamcharoen, S., & Dhirathiti, N. S. (2018). A case study of the co-production approach to the implementation of education for sustainable development in Thailand. *Policy Futures in Education*, *16*(3), 327-345. https://doi.org/10.1177/1478210317739487

O'Keefe, H., & O'Keefe, W. M. (2017). Evolving pathways to more effectively align UNGC and PRME in pursuit of the sustainable development goals. In P. M., Flynn, T. K, Tan, & M. Gudić (Eds.), *Redefining success: Integrating sustainability into management education* (pp. 13-28). Routledge. https://doi.org/10.9774/gleaf.9781351268806

Ortiz-de-Urbina-Criado, M., Mora-Valentín, E. M., & Nájera-Sánchez, J. J. (2022). Sustainability and entrepreneurship: emerging opportunities for business and management education. *Journal of Entrepreneurship in Emerging Economies*, ahead-of-print. https://doi.org/10.1108/JEEE-12-2021-0471

Oxborrow, L., & Lund-Thomsen, P. (2017). Sustainable supply chain management. In M. Petra (Ed.), *The business student's guide to sustainable management: principles and practice* (2nd ed., pp. 378-408). Routledge. https://doi.org/10.4324/9781351216500

Painter-Morland, M. (2015). Philosophical assumptions undermining responsible management education. *Journal of Management Development*, *34*(1), 61-75. https://doi.org/10.1108/JMD-06-2014-0060

Parkes, C. (2017). The principles for responsible management education (PRME): The first decade–what has been achieved? The next decade–responsible management education's challenge for the sustainable development goals (SDGs). *International Journal of Management in Education, 15*(2), 61-65. https://doi.org/10.1016/j.ijme.2017.05.003

Pee, S., & Vululleh, N. (2020). Role of Universities in Transforming Society: Challenges and Practices. In E. Sengupta, P. Blesinger, & C. Mahoney (Eds.), *International Perspectives on Policies, Practices & Pedagogies for Promoting Social Responsibility in Higher Education* (pp. 67-79). Emerald. https://doi.org/10.1108/S2055-3641202032

Pellegrino, J. W., Baxter, G. P., & Glaser, R. (1999). Chapter 9: Addressing the "Two Disciplines" Problem: Linking Theories of Cognition and Learning with Assessment and Instructional Practice. *Review of research in education*, *24*(1), 307-353. https://doi.org/10.3102/0091732X024001307

Pinto, D. C., Nique, W. M., Añaña, E. D. S., & Herter, M. M. (2011). Green consumer values: how do personal values influence environmentally responsible water consumption?. *International Journal of Consumer Studies*, *35*(2), 122-131. https://doi.org/10.1111/j.1470-6431.2010.00962.x

PISA. (2018). *Preparing our youth for an inclusive and sustainable world: The OECD PISA global competence framework.* OECD. https://www.oecd.org/education/Global-competency-for-an-inclusive-world.pdf

Peter, J., & Lauf, E. (2002). Reliability in cross-national content analysis. *Journalism & Mass Communication Quarterly*, *79*(4), 815-832. https://doi.org/10.1177/107769900207900404

Poeck, K. V., Lysgaard, J. A., & Reid, A. (2018). *Environmental and sustainability education policy: International trends, priorities and challenges* (1st ed.). Routledge https://www.routledge.com/Environmental-and-Sustainability-Education-Policy-International-Trends/Poeck-Lysgaard-Reid/p/book/9780367891442

Polit, D. F., & Beck, C. T. (2006). The content validity index: are you sure you know what's being reported? Critique and recommendations. *Research in Nursing & Health*, *29*(5), 489-497. https://doi.org/10.1002/nur.20147

Portelli, J. P. (1993). Exposing the hidden curriculum. *Journal of Curriculum Studies, 25*(4), 343-358. http://doi.org/10.1080/0022027930250404

PRME (2016). *The UN Sustainable Development Goals realised through responsible management education: Strenghtening PRME's network and aligning with UN priorities*. PRME. https://d1ngk2wj7yt6d4.cloudfront.net/public/uploads/PDFs/160517PRMEStrategicReviewFINAL.pdf

PRME. (2019). *PRME annual report 2018-2019*. United Nations. https://d30mzt1bxg5llt.cloudfront.net/public/uploads/PDFs/PRME-Annual-Report-2018-2019_FINAL.pdf.

PRME. (2020a). *What is PRME?* PRME. https://www.unprme.org/about

PRME. (2020b). *What we do.* PRME. https://www.unprme.org/what-we-do

PRME. (2020c). *Signatories.* PRME. https://www.unprme.org/search?country=TH

PRME. (2020d). *Signatories.* https://www.unprme.org/search?country=CN

PRME. (2021a.). *History of PRME*. https://www.unprme.org/history-of-prme

PRME. (2021b, November 30). *Signatory Model.* PRME. https://www.unprme.org/signatory-model

Purvis, B., Mao, Y., & Robinson, D. (2019). Three pillars of sustainability: in search of conceptual origins. *Sustainability Science*, *14*(3), 681-695. https://doi.org/10.1007/s11625-018-0627-5

Railsback, J. (2002). *Project based instruction: Creating excitement for learning.* Northwest Regional Educational Laboratory. https://educationnorthwest.org/sites/default/files/projectbased.pdf

Rajabifard, A., Kahalimoghadam, M., Lumantarna, E., Herath, N., Hui, F. K. P., & Assarkhaniki, Z. (2021). Applying SDGs as a systematic approach for incorporating sustainability in higher education. *International Journal of Sustainability in Higher Education*, *22*(6), 1266-1284. https://doi.org/10.1108/IJSHE-10-2020-0418

Ranga, M., & Etzkowitz, H. (2013). Triple Helix systems: an analytical framework for innovation policy and practice in the Knowledge Society. *Industry and higher education*, *27*(4), 237-262. https://doi.org/10.5367/ihe.2013.0165

Rasche, A., Gilbert, D. U., & Schedel, I. (2013). Cross-disciplinary ethics education in MBA programs: Rhetoric or reality?. *Academy of Management Learning & Education*, *12*(1), 71-85. https://doi.org/10.5465/AMBPP.2012.208

Rashid, L. (2019). Entrepreneurship education and sustainable development goals: A literature review and a closer look at fragile states and technology-enabled approaches. *Sustainability*, *11*(19), 5343. https://doi.org/10.3390/su11195343

Richmond, J. M., & Baumgart, N. (1981) A Hierarchical Analysis of Environmental Attitudes. *The Journal of Environmental Education, 13*(1), 31-37. http://dx.doi.org/10.1080/00958964.1981.9943022

Rieckmann, M. (2017). *Education for sustainable development goals: Learning objectives*. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000247444

Riffe, D., Lacy, S., & G. Fico, F. (2008). *Analyzing media messages: Using quantitative content analysis in research* (2nd digital ed.). Lawrence Erlbaum Associates. https://agustinazubair.files.wordpress.com/2015/09/3-analyzing-media-messages-quantitative-content-analysis-in-research-communication-2005-daniel-riffe.pdf

Rimarioczy, I., Saillant, R., & Teal, C. (2017). A holistic learning approach for responsible management education. In R. Sunley, & J. Leigh (Eds.), *Educating For Responsible Management* (1st ed., pp. 159-184). Routledge. https://doi.org/10.4324/9781351284929

Roberts, J. A., & Bacon, D. R. (1997). Exploring the subtle relationships between environmental concern and ecologically conscious consumer behavior. *Journal of business research*, *40*(1), 79-89. https://doi.org/10.1016/S0148-2963(96)00280-9

Robinson, O. C. (2014). Sampling in interview-based qualitative research: A theoretical and practical guide. *Qualitative Research in Psychology*, *11*(1), 25-41. https://doi.org/10.1080/14780887.2013.801543

Robson, C., & McCartan, K. (2016). *Real world research* (4th ed.). Wiley. https://www.wiley.com/en-th/Real+World+Research%2C+4th+Edition-p-9781118745236

Rodríguez-Vilá, O., & Bharadwaj, S. (2017, September-October). *Competing on social purpose: Brands that win by tying mission to growth.* Harvard Business Review. https://hbr.org/2017/09/competing-on-social-purpose

Rowledge, L. R. (2017). Crowdsourcing for sustainable solutions. In M. Petra (Ed.), *The business student's guide to sustainable management: principles and practice* (2nd ed., pp. 316-354). Routledge. https://doi.org/10.4324/9781351216500

Ruesch Schweizer, C., Di Giulio, A., & Burkhardt-Holm, P. (2019). Scientific Support for Redesigning a Higher-Education Curriculum on Sustainability. *Sustainability*, *11*(21), Article e6035. https://doi.org/10.3390/su11216035

Rukspollmuang, C. (2017). Sustainability policy and practices in Thai higher education. In M. Y. Merrill, P. Burkhardt-Holm, C. H. Chang, M. S. Islam, & Y. Chang, (Eds.), *Education and Sustainability: Paradigms, Policies and Practices in Asia* (pp. 145-162). Routledge. https://www.routledge.com/Education-and-Sustainability-Paradigms-Policies-and-Practices-in-Asia/Merrill-Burkhardt-Holm-Chang-Islam-Chang/p/book/9780367272043

Rusinko, C. (2010). Integrating sustainability in management and business education: A matrix approach. *Academy of Management Learning and Education, 9*(3), 507-519. https://doi.org/10.5465/amle.9.3.zqr507

Ryan, G. W., & Bernard, H. R. (2003). Techniques to identify themes. *Field Methods*, *15*(1), 85-109. https://doi.org/10.1177/1525822X02239569

Sachs, J. D., Kroll, C., Lafortune, G., Fuller, G., & Woelm, F. (2021). *The decade of action for the sustainable development goals: Sustainable development report 2021*. Cambridge University Press. https://dashboards.sdgindex.org/rankings

Salvia, A. L., Leal Filho, W., Brandli, L. L., & Griebeler, J. S. (2019). Assessing research trends related to sustainable development goals: Local and global issues. *Journal of Cleaner Production, 208*, 841-849. https://doi.org/10.1016/j.jclepro.2018.09.242

Sambell, K., & McDowell, L. (1998). The construction of the hidden curriculum: messages and meanings in the assessment of student learning. *Assessment & Evaluation in Higher Education, 23*(4), 391-402. https://doi.org/10.1080/0260293980230406

Sánchez-Hernández, M. I., & Maldonado-Briegas, J. J. (2019). Sustainable entrepreneurial culture programs promoting social responsibility: a European regional experience. *Sustainability*, *11*(13), Article e3625. https://doi.org/10.3390/su11133625

Santa, C. M., & Santa, J. L. (1995). Teacher as researcher. *Journal of Reading Behavior*, *27*(3), 439-451. https://doi.org/10.1080/10862969509547891

Savelyeva, T., & Douglas, W. (2017). Global consciousness and pillars of sustainable development: a study on self-perceptions of the first-year university students. *International Journal of Sustainability in Higher Education*, *18*(2), 218-241. https://doi.org/10.1108/IJSHE-04-2016-0063

Schreiber, J. R., & Siege, H. (2016). *Curriculum framework: Education for sustainable development*. Engagement global, gGmbH, Bonn. https://www.globaleslernen.de/sites/default/files/files/link-elements/curriculum_framework_education_for_sustainable_development_barrierefrei.pdf

Secomb, J. M., & Smith, C. (2011). A mixed method pilot study: The researchers' experiences. *Contemporary Nurse*, *39*(1), 31-35. https://doi.org/10.5172/conu.2011.39.1.31

Setó-Pamies, D., & Papaoikonomou, E. (2016). A multi-level perspective for the integration of ethics, corporate social responsibility and sustainability (ECSRS) in management education. *Journal of Business Ethics*, *136*(3), 523-538. https://doi.org/10.1007/s10551-014-2535-7

Setó-Pamies, D., & Papaoikonomou, E. (2020). Sustainable development goals: A powerful framework for embedding ethics, CSR, and sustainability in management education. *Sustainability*, *12*(5), Article e1762. https://doi.org/10.3390/su12051762

Sharma, D. (2020). Integrating Social and Educational Responsibility: Concept, Model and Challenges. In E. Sengupta, P. Blesinger, & C. Mahoney (Eds.), *International perspectives on policies, practices & pedagogies for promoting pocial responsibility in higher education* (pp. 25-37). Emerald. https://doi.org/10.1108/S2055-3641202032

Shiel, C., Smith, N., & Cantarello, E. (2019). Aligning campus strategy with the SDGs: an institutional case study. In W. Leal Filho, A. Salvia, L. Bradli, & R. Pretorius (Eds.), *Universities as living labs for sustainable development: Supporting the implementation of the sustainable development goals* (pp. 17-27). Springer. https://doi.org/10.1007/978-3-030-15604-6

Sigmon, R. (1979). Service-learning: Three principles. *Synergist, 8*(1), 9-11. https://nsee.memberclicks.net/assets/docs/KnowledgeCenter/IntegratingExpEduc/BooksReports/55.%20service%20learning%20three%20principles.pdf

Sinakou, E., Boeve-de Pauw, J., & Van Petegem, P. (2019). Exploring the concept of sustainable development within education for sustainable development: Implications for ESD research and practice. *Environment, Development and Sustainability*, *21*(1), 1–10. https://doi.org/10.1007/s10668-017-0032-8

Sidiropoulos, E. (2018). The personal context of student learning for sustainability: Results of a multi-university research study. *Journal of Cleaner Production, 181*, 537-554. https://doi.org/10.1016/j.jclepro.2018.01.083

Sobey School of Business (2018-2020). *Report on our Commitment to Responsible Management Education*. https://d30mzt1bxg5llt.cloudfront.net/public/uploads/sip-reports/Sobey-School-of-Business-_-SIP-2020_Final.pdf

Solitander, N., Fougère, M., Sobczak, A., & Herlin, H. (2012). We are the champions: Organizational learning and change for responsible management education. *Journal of Management Education, 36*(3), 337-363. https://doi.org/10.1177/1052562911431554

Sonetti, G., Barioglio, C., & Campobenedetto, D. (2020). Education for sustainability in practice: a review of current strategies within Italian universities. *Sustainability*, *12*(13), 5246. https://doi.org/10.3390/su12135246

Stemler, S. E., & Bebell, D. (2012). *The school mission statement: Values, goals, and identities in American Education*. (1st ed.). Routledge. https://doi.org/10.4324/9781315854052

Stemler, S. E. (2015). Content analysis. In R. Scott & S. Kosslyn (Eds.), *Emerging trends in the social and behavioral sciences* (pp. 1-14). John Wiley & Sons. https://doi.org/ 10.1002/9781118900772

Sterling, S. (2013). The sustainable university: Challenge and response. In S. Sterling, L. Maxey, & H. Luna (Eds.), *The sustainable university: Progress and prospects* (pp. 17-50). Routledge. https://doi.org/10.4324/9780203101780

Stephens, J. C., & Graham, A. C. (2010). Toward an empirical research agenda for sustainability in higher education: exploring the transition management framework. *Journal of Cleaner Production*, *18*(7), 611-618. https://doi.org/10.1016/j.jclepro.2009.07.009

Stevenson, R. B., Brody, M., Dillon, J., & Wals, A. E. (2014). *International handbook of research on environmental education*. Routledge.

Storey, M., Killian, S., & O'Regan, P. (2017). Responsible management education: Mapping the field in the context of the SDGs. *The International Journal of Management Education*, *15*(2), 93-103. https://doi.org/10.1016/j.ijme.2017.02.009

Stubbs, W., Ho, S. S., Abbonizio, J. K., Paxinos, S., & Bos, J. J. A. (2021). Addressing the SDGs through an integrated model of collaborative education. In W. Leal Filho, A. L. Salvia, & F. Frankenberger (Eds.), *Handbook on teaching and learning for sustainable development* (pp. 252-271). Edward Elgar. https://doi.org/10.4337/9781839104657

Suriyankietkaew, S., & Hallinger, P. (2018). Empirical research on education for sustainable development in sufficiency-based schools. *European Journal of Sustainable Development*, *7*(3), 205-205. https://doi.org/10.14207/ejsd.2018.v7n3p205

Swaim, J. A., Maloni, M. J., Napshin, S. A., & Henley, A. B. (2014). Influences on student intention and behavior toward environmental sustainability. *Journal of Business Ethics*, *124*(3), 465-484. http://dx.doi.org/10.1007/s10551-013-1883-z

Tandon, R. (2017). *Making the commitment: The contributions of higher education to SDGs*. Participatory Research in Asia. http://unescochair-cbrsr.org/pdf/resource/Making%20the%20Commitment_SDGs-Sep_2017_final.pdf

Tang, R., & Sae-Lim, W. (2016). Data science programs in US higher education: An exploratory content analysis of program description, curriculum structure, and course focus. *Education for Information*, *32*(3), 269-290. https://doi.org/10.3233/EFI-160977

Thorndike, R. M., & Thorndike-Christ, T. M. (2009). *Measurement and evaluation in psychology and education* (8th Ed.). Pearson. https://www.pearson.com/us/higher-education/program/Thorndike-Measurement-and-Evaluation-in-Psychology-and-Education-8th-Edition/PGM58995.html

Tian, M., Lu, G., Yin, H., & Li, L. (2020). Student engagement for sustainability of Chinese international education: The case of international undergraduate students in China. *Sustainability, 12*(17), 6831. https://doi.org/10.3390/su12176831

Topuzova, L. N., Tecle, A. S., Ha, A. T., & Hunter, R. (2020). Global Learning Communities: Bridging Borders and Building Capacity of Communities on the Margins. In E. Sengupta, P. Blesinger, & C. Mahoney (Eds.), *International Perspectives on Policies, Practices & Pedagogies for Promoting Social Responsibility in Higher Education* (pp. 147-161). Emerald. https://doi.org/10.1108/S2055-364120203 2

Ulukaya, H. (2019, May). *The anti-CEO playbook* [Video]. TED Conferences. https://www.ted.com/talks/hamdi_ulukaya_the_anti_ceo_playbook?language=en

UNDESA. (2018). *Compendium of National Institutional Arrangements for implementing the 2030 Agenda for Sustainable Development. The 46countries that presented voluntary national reviews at the High-level Political Forum in 2016 and 2017*. UN Department for Economic and Social Affairs Division for Public Institutions and Digital Government https://sustainabledevelopment.un.org/content/documents/22008UNPAN99132.pdf

UNESCO. (2007). *The UN Decade of Education for Sustainable Development (DESD 2005-2014): the first two years*. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000154093

UNESCO. (2014). *Roadmap for implementing the Global Action Programme on Education for Sustainable Development*. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000230514

UNESCO. (2019). *Framework for the implementation of education for sustainable development (ESD) beyond 2019.* UNESCO. https://www.oneplanetnetwork.org/sites/default/files/40_c23_framework_for_the_implementation_of_esd_beyond_2019.pdf

UNESCO. (2020a). *Education for sustainable development: a roadmap*. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000374802

UNESCO. (2020b). *Educational content up close: Examining the learning dimensions of education for sustainable development and global citizenship education.* UNESCO. https://www.oneplanetnetwork.org/resource/educational-content-close-examining-learning-dimensions-education-sustainable-development

UNEP. (2020, May 26). *COVID-19: Four sustainable development goals that help future-proof global recovery.* UN environment programme. https://www.unenvironment.org/news-and-stories/story/covid-19-four-sustainable-development-goals-help-future-proof-global

UNESCO. (2021). *Education for sustainable development.* https://en.unesco.org/themes/education-sustainable-development

United Nations. (1992, June 3-14). *Agenda 21* [Conference agenda]. United Nations Conference on Environment & Development Rio de Janerio, Brazil. https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf

United Nations. (2015). *Transforming our World: The 2030 Agenda for Sustainable Development*. United Nations Department of Economic and Social Affairs. https://sustainabledevelopment.un.org/post2015/transformingourworld/publication

United Nations Statistics Division. (2020). *SDG Indicators Metadata.* United Nations Department of Economic and Social Affairs. https://unstats.un.org/sdgs/metadata/files/Metadata-04-07-01.pdf

United Nations. (2020). *The Sustainable Development Goals Report.* United Nations Department of Economic and Social Affairs. https://unstats.un.org/sdgs/report/2020/

United Nations. (2021). *The 17 goals.* https://sdgs.un.org/goals

United Nations. (2022). *Member states*. United Nations. https://www.un.org/en/about-us/member-states#gotoA

University of Dubai (2015-2016). *PRME Sharing Information on Progress.* https://d30mzt1bxg5llt.cloudfront.net/public/uploads/sip-reports/SIP201520162.pdf

Urbaniec, M. (2018). Sustainable entrepreneurship: Innovation-related activities in European enterprises. *Polish Journal of Environmental Studies, 27*(4), 1773-1779. https://doi.org/10.15244/pjoes/78155

Vallance, E. (1974). Hiding the hidden curriculum: An interpretation of the language of justification in nineteenth-century educational reform. *Curriculum Theory Network, 4*(1), 5-21. https://doi.org/10.2307/1179123

Van Teijlingen, E. R., & Hundley, V. (2001). The importance of pilot studies. *Social Research Update,* (35). http://sru.soc.surrey.ac.uk/SRU35.html

Wals, A. E. (2014). Sustainability in higher education in the context of the UN DESD: a review of learning and institutionalization processes. *Journal of Cleaner Production*, *62*, 8-15. https://doi.org/10.1016/j.jclepro.2013.06.007

Wang, J., Yang, M., & Maresova, P. (2020). Sustainable development at higher education in China: a comparative study of students' perception in public and private universities. *Sustainability*, *12*(6), Article e2158. https://doi.org/10.3390/su12062158

Warin, C., & Beddewela, E. (2016). Drivers, barriers and enablers of institutionalizing responsible management education. In R. Sunley, & J. Leigh (Eds.), *Educating for responsible management* (1st ed., pp. 301-323). Routledge. https://doi.org/10.4324/9781351284929

Warwick, P., Wyness, L., & Conway, H. (2017). 'Think of the future': Managing educational change from students' perspectives of an undergraduate sustainable business programme. *The International Journal of Management Education*, *15*(2), 192-204. http://dx.doi.org/10.1016/j.ijme.2017.03.010

Wersun, A. (2017). Context and the institutionalisation of PRME: The case of the University for the Common Good. *The International Journal of Management Education*, *15*(2), 249-262. http://dx.doi.org/10.1016/j.ijme.2017.02.012

Wersun, A., Klatt, J., Azmat, F., Suri, H., Hauser, C., Bogie, J., Meaney, M & Ivanov., N. (2020). *Blueprint for SDG integration into curriculum, research and partnerships.* PRME. https://d30mzt1bxg5llt.cloudfront.net/public/uploads/PDFs/BlueprintForSDGIntegration.pdf

Weybrecht, G. (2022). Business schools are embracing the SDGs–But is it enough?–How business schools are reporting on their engagement in the SDGs. *The International Journal of Management Education*, *20*(1), Article e100589. https://doi.org/10.1016/j.ijme.2021.100589

Weybrecht, G. (2021). How management education is engaging students in the sustainable development goals. *International Journal of Sustainability in Higher Education*, *22*(6), 1302-1315. https://doi.org/10.1108/IJSHE-10-2020-0419

Weybrecht, G. (2017). From challenge to opportunity–Management education's crucial role in sustainability and the Sustainable Development Goals–An overview and framework. *The International Journal of Management Education*, *15*(2), 84-92. https://doi.org/10.1016/j.ijme.2017.02.008

White, K., Habib, R., & Hardisty, D. J. (2019). How to SHIFT consumer behaviors to be more sustainable: A literature review and guiding framework. *Journal of Marketing*, *83*(3), 22-49. http://doi.org/10.1177/0022242919825649

Wiek, A., Withycombe, L., & Redman, C. L. (2011). Key competencies in sustainability: a reference framework for academic program development. *Sustainability science*, *6*(2), 203-218. https://doi.org/10.1007/s11625-011-0132-6

Winfield, F., & Ndlovu, T. (2019). "Future-proof your Degree": Embedding sustainability and employability at Nottingham Business School (NBS). *International Journal of Sustainability in Higher Education*, *20*(8), 1329-1342. https://doi.org/10.1108/IJSHE-10-2018-0196

Winter, J., & Cotton, D. (2012). Making the hidden curriculum visible: Sustainability literacy in higher education. *Environmental Education Research, 18*(6), 783-796. http://doi.org/10.1080/13504622.2012.670207

Wong, L. T. (2017). Mission possible: Introducing sustainability as an experiential entrepreneurship activity. In J. A. Arevalo, & S. F. Mitchell (Eds.), *Handbook of sustainability in management education: In search of a multidisciplinary, innovative and integrated Approach* (pp. 175-200). Edward Elgar Publishing. https://www.e-elgar.com/shop/gbp/handbook-of-sustainability-in-management-education-9781785361234.html

Wood Jr, T., & Pansarella, L. (2019). Inside the borders but outside the box: An immersion program aligned with the PRME and the SDG to foster reflexivity. *The International Journal of Management Education, 17*(3), Article e100306. https://doi.org/10.1016/j.ijme.2019.100306

World Health Organization. (2018, February). *Millennium Development Goals (MDGs)*. World Health Organization. https://www.who.int/news-room/fact-sheets/detail/millennium-development-goals-(mdgs)

Wurdinger, S. D., & Carlson, J. A. (2009). *Teaching for experiential learning: Five approaches that work*. R&L Education. https://www.amazon.com/Teaching-Experiential-Learning-Five-Approaches-ebook-dp-B0044R9I9Y/dp/B0044R9I9Y/ref=mt_other?_encoding=UTF8&me=&qid=1627013707

Wu, Y. C. J., Huang, S., Kuo, L., & Wu, W. H. (2010). Management education for sustainability: A web-based content analysis. *Academy of Management Learning & Education*, *9*(3), 520-531. https://doi.org/10.5465/amle.9.3.zqr520

Wu, Y. C. J., Shen, J. P., & Kuo, T. (2015). An overview of management education for sustainability in Asia. *International Journal of Sustainability in Higher Education, 16*(3), 341-353. http://dx.doi.org/10.1108/IJSHE-10-2013-0136

Wu, Y. C. J., & Shen, J. P. (2016). Higher education for sustainable development: a systematic review. *International Journal of Sustainability in Higher Education, 17*(5), 633-651 https://doi.org/10.1108/IJSHE-01-2015-0004

Yuan, X., Yu, L., & Wu, H. (2021). Awareness of sustainable development goals among students from a Chinese senior high school. *Education Sciences*, *11*(9), 458. https://doi.org/10.3390/educsci11090458

Yu, M. (2011). *Educational testing and assessment* (3rd ed.). Psychological Publishing. https://www.psy.com.tw/ec99/ushop20128/GoodsDescr.asp?category_id=110&parent_id=92&prod_id=81040

Zeng, M., & Stratton, R. (2017). Sustainable operations management. In M. Petra (Ed.), *The business student's guide to sustainable management: principles and practice* (2nd ed., pp. 355-377). Routledge. https://doi.org/10.4324/9781351216500

Zhang, Y., Chen, P., & Yu, T. (2019). Reading and Writing Learning Strategies for Low English Proficiency Students at a Private University in China. *International Journal of Higher Education*, *8* (3), 214-225. https://doi.org/0.5430/ijhe.v8n3p214.

Zhou, L., Rudhumbu, N., Shumba, J., & Olumide, A. (2020). Role of higher education institutions in the implementation of Sustainable Development Goals. In G. Nhamo & V. Mjimba (Eds.), *Sustainable Development Goals and institutions of higher education* (pp. 121-130). Springer. https://doi.org/10.1007/978-3-030-26157-3

APPENDICES

Appendix I: Authors' Curriculum Vitae

Curriculum Vitae

NAME Meng-Tien Chiang

EDUCATION

Ph.D., Dhurakij Pundit University, Thailand 2019.08−2022.08
Education Management

MSc, Bournemouth University, Bournemouth, UK 2014.09−2016.03
Innovation Management and Entrepreneurship

BBA, Chang Jung Christian University, Tainan, Taiwan 2005.09−2009.06
International Business Management

CURRENT WORK EXPERIENCE

Dhurakij Pundit University, Thailand 2016.10−Present
Chinese International College
Assistant Director, International Business Program

Appendix II: Informed consent form of research participant

Title of Research Project

Education for Sustainability to International Chinese College Students of Business Program in Thailand

Date of Signature: ..... year ..... month ..... day

Name ..... Address .....

I have read in detail the Informed Consent Form of Research Participant in the edition of _____ (date) and am willing voluntarily to participate in this research project.

I have received the electronic file of the Informed Consent Form of Research Participant I personally filled out previously. In this regard, I, as well as all the other members who agree to participate in this project, have already been familiar before signing with the purpose, time, method, potential risks and benefits of this research. Besides, sufficient time used for consultation has been offered to not only me but also the rest of participants, and the researcher has accordingly answered all the questions put forward by us in a detailed and transparent manner, much to our satisfaction.

I, together with all the other participants, have learned from the researcher that nobody is going to receive any compensation if any risk emerges during the research process.

I have been told that every participant is allowed to withdraw from this project at any time without giving any reason; meanwhile, our withdrawal will not affect our academic performance or learning opportunities at all.

The researcher promises to strictly keep the personal information of each participant confidential and will not disclose it to the public until the participants' consent has been obtained.

The researcher promises to stop collecting any further information about a certain research participant once this individual has proposed to withdraw from the project and to have all his/her corresponding materials or samples which can still be found destroyed completely.

It is well learned that I, as well as the other participants, am given the right not only to inspect or modify our personal information related to this research, but also to terminate the researcher's right of using our data and any other information concerned after we have notified the researcher.

I am extremely clear about what procedures the research data collected from me will go through, such as data collecting, data recording on the computer, data inspecting, data analyzing, and academic reporting which includes being referring to in the future educational study.

I have read and am familiar with all the contents above, and hereby I am filling out this questionnaire, agreeing to participate in this research project.

◎I have read and am familiar with all the contents above and agree to participate in the research project conducted by Aj. Ment-Tien Chiang.

◎I do not agree to participate in the research project conducted by Aj. Ment-Tien Chiang.

Appendix III: Cohen's kappa coefficient of SIP report context unit inference by intercoder

Cohen's Kappa Coefficient = 0.832453290008123																																
Coder A	Coder B																															SUM
	24	[SPACE]	16	37	12	33	13	11	19	18	39	15	28	23	17	7	3	9	10	8	14	35	36	27	30	4	38	25	32	21	
24	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
[SPACE]	2	19	0	1	0	0	0	1	0	0	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	28
16	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
37	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
12	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
33	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
13	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
11	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
19	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
18	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
39	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
15	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
28	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
23	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
SUM	5	20	2	4	4	1	2	8	1	1	3	3	1	2	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	75

Appendix IV: Experts' comments for the curriculum module and mapping of learning outcomes

Code	Expert	Expert's comments	Revision
Co 4	B	This learning outcome should be added to human resource management, business laws and ethics, and the value-based leadership module.	This comment was adopted to map the learning outcomes.
Co 6	B	This learning outcome should be added to the Healthy and Happy Life and Technological Environment and Quality of Life module.	This comment was adopted to map the learning outcomes.
Co 18	B	This learning outcome should be added to the module of international business entry strategy and strategic management.	This comment was adopted to map the learning outcomes.
Co 20	B	This learning outcome should be added to the module of international business entry strategy and strategic management.	This comment was adopted to map the learning outcomes.
Se 7	B	This learning outcome should be added to the module of Business Information Systems, Business Intelligence Management, and Business Communication.	This comment was adopted to map the learning outcomes.
Se 15	B	This learning outcome is also related to the Sustainability Managing, Principles of Entrepreneurship, and Global Supply Chain Management module.	This comment was adopted to map the learning outcomes.
Co 16	C	This learning outcome should be deleted from the principles of marketing, brand management, and consumer behaviour module.	This comment was adopted to map the learning outcomes.
Co 4	E	This learning outcome is also suitable for the principles of management and operation and multinational organisation management module.	This comment was adopted to map the learning outcomes.

Code	Expert	Expert's comments	Revision
Co 5	E	This learning outcome should also be added to the module of operations management, import and export management, and cross-culture communication and management.	This comment was adopted to map the learning outcomes.
Co 15	E	This learning outcome should also add to the module of operations management, import and export management, and cross-culture communication and management.	The comment was adopted to map the learning outcomes.
Co 22	E	This learning outcome should be added to the principles of marketing, brand management, and consumer behaviour module.	The comment was adopted to map the learning outcomes.
Se 18	E	This learning outcome is also suitable for the sustainability managing, principles of entrepreneurship, and global supply chain management module.	This comment was adopted to map the learning outcomes.
Be 25	E	This learning outcome should be added to the international business entry strategy, and strategic management module.	This comment was adopted to map the learning outcomes.

Appendix V: The revision of curriculum modules and learning outcomes

Competency	Modules		ESD Learning outcomes	
	Grade	Courses	Code	Definition
Foundation business competence and creativity	1 (Module 1)	• Principles of Accounting • Introduction to Economics • Computer Applications for Professional work	Co 1	The learner understands the concepts of sustained, inclusive and sustainable economic growth, full and productive employment, and decent work, including the advancement of gender parity and equality, and knows about alternative economic models and indicators.
			Co 3	The learner understands the relation between employment and economic growth, and knows about other moderating factors like a growing labour force or new technologies that substitute jobs.
			Co 4	The learner understands how low and decreasing wages for the labour force and very high wages and profits of managers and owners or shareholders are leading to inequalities, poverty, civil unrest, etc.
			Se 1	The learner is able to discuss economic models and future visions of economy and society critically and to communicate them in public spheres.

Competency	Modules		ESD Learning outcomes	
	Grade	Courses	Code	Definition
Foundation business competence and creativity	1 (Module 2)	• Communication skills in Thai for Non-Native Speakers • Critical and Innovative Mindset • ASEAN and Cross-culture Communication	Co13	The learner understands the historical reasons for settlement patterns and while respecting cultural heritage, understands the need to find compromises to develop improved sustainable systems.
			Se13	The learner is able to reflect on their region in the development of their own identity, understanding the roles that the natural, social and technical environments have had in building their identity and culture.
			Be 6	The learner is able to identify opportunities in their own culture and nation for greener and more resilient approaches to infrastructure, understanding their overall benefits for societies, especially with regard to disaster risk reduction.
Innovation and technology, and Marketing	1 (Module 3)	• Healthy and Happy Life • Technology, Environment and Quality of Life	Co 6	The learner understands the concepts of sustainable infrastructure and industrialization and society's needs for a systemic approach to their development.
			Co16	The learner understands how individual lifestyle choices influence social, economic and

Competency	Modules		ESD Learning outcomes	
	Grade	Courses	Code	Definition
Innovation and technology, and Marketing	1 (Module 3)	• Healthy and Happy Life • Technology, Environment and Quality of Life	Co16	environmental development.
			Co24	The learner recognizes the importance of cooperation on and access to science, technology and innovation, and knowledge sharing.
			Se 15	The learner is able to feel responsible for the environmental and social impacts of their own individual lifestyle.
			Se 19	The learner is able to envision sustainable lifestyles.
			Se25	The learner is able to experience a sense of belonging to a common humanity, sharing values and responsibilities, based on human rights.
	1 (Module 4)	• Principles of Marketing • Brand Management • Consumer Behaviour • Introduction to International Business	Co19	The learner knows about strategies and practices of sustainable production and consumption.
			Co22	The learner understands the importance of global multi-stakeholder partnerships and the shared accountability for sustainable development and knows examples of

Competency	Modules		ESD Learning outcomes	
	Grade	Courses	Code	Definition
Innovation and technology, and Marketing	1 (Module 4)	• Principles of Marketing • Brand Management • Consumer Behaviour • Introduction to International Business	Co22	networks, institutions, campaigns of global partnerships.
			Se 3	The learner is able to understand how one's own consumption affects working conditions of others in the global economy.
			Se 16	The learner is able to communicate the need for sustainable practices in production and consumption.
			Se 18	The learner is able to differentiate between needs and wants and to reflect on their own individual consumer behaviour in light of the needs of the natural world, other people, cultures and countries, and future generations.
			Se 20	The learner is able to feel responsible for the environmental and social impacts of their own individual behaviour as a producer or consumer.
			Be 1	The learner is able to engage with new visions and models of a sustainable, inclusive economy and decent work.
			Be 8	The learner is able to innovate and develop sustainable enterprises to respond to their countries' industrial needs.

Competency	Modules		ESD Learning outcomes	
	Grade	Courses	Code	Definition
Innovation and technology, and Marketing	1 (Module 4)	• Principles of Marketing • Brand Management • Consumer Behaviour • Introduction to International Business	Be21	The learner is able to become a change agent to realize the SDGs and to take on their role as an active, critical and global and sustainability citizen.
			Be24	The learner is able to support development cooperation activities.
			Be25	The learner is able to influence companies to become part of global partnerships for sustainable development.
	1 (Module 5)	• Information Security in Modern Business • Eastern and Western Views and Values	Co13	The learner understands the historical reasons for settlement patterns and while respecting cultural heritage, understands the need to find compromises to develop improved sustainable systems.
			Co24	The learner recognizes the importance of cooperation on and access to science, technology and innovation, and knowledge sharing.
			Be 6	The learner is able to identify opportunities in their own culture and nation for greener and more resilient approaches to infrastructure, understanding their overall benefits for societies, especially with regard to disaster risk reduction.

Competency	Modules		ESD Learning outcomes	
	Grade	Courses	Code	Definition
Critical thinking and Management	2 (Module 1)	• Principles of Entrepreneurship • Sustainability Managing • Global Supply Chain Management	Co 5	The learner understands how innovation, entrepreneurship and new job creation can contribute to decent work and a sustainability-driven economy and to the decoupling of economic growth from the impacts of natural hazards and environmental degradation.
			Co10	The learner is aware of new opportunities and markets for sustainability innovation, resilient infrastructure and industrial development.
			Co12	The learner is able to evaluate and compare the sustainability of their and other settlements' systems in meeting their needs particularly in the areas of food, energy, transport, water, safety, waste treatment, inclusion and accessibility, education, integration of green spaces and disaster risk reduction.
			Co17	The learner understands production and consumption patterns and value chains and the interrelatedness of production and

Competency	Modules		ESD Learning outcomes	
	Grade	Courses	Code	Definition
Critical thinking and Management	2 (Module 1)	• Principles of Entrepreneurship • Sustainability Managing • Global Supply Chain Management	Co17	consumption (supply and demand, toxics, CO2 emissions, waste generation, health, working conditions, poverty, etc.).
			Co18	The learner knows roles, rights and duties of different actors in production and consumption (media and advertising, enterprises, municipalities, legislation, consumers, etc.).
			Co19	The learner knows about strategies and practices of sustainable production and consumption.
			Co20	The learner understands dilemmas/trade-offs related to and system changes necessary for achieving sustainable consumption and production.
			Co23	The learner knows the concepts of global governance and global citizenship.
			Se 3	The learner is able to understand how one's own consumption affects working conditions of others in the global economy.
			Se 10	The learner is able to understand that with changing resource availability (e. g. peak oil, peak everything) and other external

Competency	Modules		ESD Learning outcomes	
	Grade	Courses	Code	Definition
Critical thinking and Management	2 (Module 1)	• Principles of Entrepreneurship • Sustainability Managing • Global Supply Chain Management	Se 10	shocks and stresses (e. g. natural hazards, conflicts) their own perspective and demands on infrastructure may need to shift radically regarding availability of renewable energy for ICT, transport options, sanitation options, etc.
			Se 11	The learner is able to use their voice, to identify and use entry points for the public in the local planning systems, to call for the investment in sustainable infrastructure, buildings and parks in their area and to debate the merits of long-term planning.
			Se 15	The learner is able to feel responsible for the environmental and social impacts of their own individual lifestyle.
			Se 16	The learner is able to communicate the need for sustainable practices in production and consumption.
			Se 18	The learner is able to differentiate between needs and wants and to reflect on their own individual consumer behaviour in light of the needs of the natural world, other people,

Competency	Modules		ESD Learning outcomes	
	Grade	Courses	Code	Definition
Critical thinking and Management	2 (Module 1)	• Principles of Entrepreneurship • Sustainability Managing • Global Supply Chain Management	Se 18	cultures and countries, and future generations.
			Se 22	The learner is able to work with others to promote global partnerships for sustainable development and demand governments' accountability for the SDGs.
			Se 23	The learner is able to take ownership of the SDGs.
			Se 24	The learner is able to create a vision for a sustainable global society.
			Be 1	The learner is able to engage with new visions and models of a sustainable, inclusive economy and decent work.
			Be 3	The learner is able to develop and evaluate ideas for sustainability-driven innovation and entrepreneurship.
			Be 8	The learner is able to innovate and develop sustainable enterprises to respond to their countries' industrial needs.
			Be11	The learner is able to plan, implement and evaluate community-based sustainability projects.
			Be18	The learner is able to promote sustainable production patterns.

Competency	Modules		ESD Learning outcomes	
	Grade	Courses	Code	Definition
Critical thinking and Management	2 (Module 1)	• Principles of Entrepreneurship • Sustainability Managing • Global Supply Chain Management	Be21	The learner is able to become a change agent to realize the SDGs and to take on their role as an active, critical and global and sustainability citizen.
			Be23	The learner is able to publicly demand and support the development of policies promoting global partnerships for sustainable development.
			Be25	The learner is able to influence companies to become part of global partnerships for sustainable development.
	2 (Module 2)	• Business Mind and Start-up Thinking • Service Operation Management • Business Research Methods	Co11	The learner understands basic physical, social and psychological human needs and is able to identify how these needs are currently addressed in their own physical urban, peri-urban and rural settlements.
			Se 7	The learner is able to encourage their communities to shift their infrastructure and industrial development toward more resilient and sustainable forms.
			Be 4	The learner is able to plan and implement entrepreneurial projects.

Competency	Modules		ESD Learning outcomes	
	Grade	Courses	Code	Definition
Critical thinking and Management	2 (Module 2)	• Business Mind and Start-up Thinking • Service Operation Management • Business Research Methods	Be 8	The learner is able to innovate and develop sustainable enterprises to respond to their countries' industrial needs.
			Be24	The learner is able to support development cooperation activities.
			Be25	The learner is able to influence companies to become part of global partnerships for sustainable development.
Innovation and Entrepreneurship	2 (Module 3)	• Human Resource Management • Business Laws and Ethics • Value Based Leadership	Co 4	The learner understands how low and decreasing wages for the labour force and very high wages and profits of managers and owners or shareholders are leading to inequalities, poverty, civil unrest, etc.
			Co15	The learner understands the role of local decision-makers and participatory governance and the importance of representing a sustainable voice in planning and policy for their area.
			Co23	The learner knows the concepts of global governance and global citizenship.
			Se 2	The learner is able to collaborate with others to demand fair wages, equal pay for equal work and labour rights fro

Competency	Modules		ESD Learning outcomes	
	Grade	Courses	Code	Definition
Innovation and Entrepreneurship	2 (Module 3)	• Human Resource Management • Business Laws and Ethics • Value Based Leadership	Se 2	from politicians and from their employer.
			Se 4	The learner is able to identify their individual rights and clarify their needs and values related to work.
			Se 17	The learner is able to encourage others to engage in sustainable practices in consumption and production.
			Be 8	The learner is able to innovate and develop sustainable enterprises to respond to their countries' industrial needs.
			Be21	The learner is able to become a change agent to realize the SDGs and to take on their role as an active, critical and global and sustainability citizen.
	2 (Module 4)	• Business Information Systems • Business Intelligence Management • Business Communication	Se 2	The learner is able to collaborate with others to demand fair wages, equal pay for equal work and labour rights from politicians and from their employer.
			Se 5	The learner is able to develop a vision and plans for their own economic life based on an analysis of their competencies and contexts.

Competency	Modules		ESD Learning outcomes	
	Grade	Courses	Code	Definition
Innovation and Entrepreneurship	2 (Module 4)	• Business Information Systems • Business Intelligence Management • Business Communication	Se 7	The learner is able to encourage their communities to shift their infrastructure and industrial development toward more resilient and sustainable forms.
			Se 16	The learner is able to communicate the need for sustainable practices in production and consumption.
			Be13	The learner is able to speak against/for and to organize their voice against/for decisions made for their community.
			Be15	The learner is able to promote low carbon approaches at the local level.
	2 (Module 5)	• Principles of Management and Organization • Multinational Organization Management	Co 4	The learner understands how low and decreasing wages for the labour force and very high wages and profits of managers and owners or shareholders are leading to inequalities, poverty, civil unrest, etc.
			Co22	The learner understands the importance of global multi-stakeholder partnerships and the shared accountability for sustainable development and knows examples of networks, institutions, campaigns of global partnerships.

Competency	Modules		ESD Learning outcomes	
	Grade	Courses	Code	Definition
Innovation and Entrepreneurship	2 (Module 5)	• Principles of Management and Organization • Multinational Organization Management	Be 1	The learner is able to engage with new visions and models of a sustainable, inclusive economy and decent work.
			Be 8	The learner is able to innovate and develop sustainable enterprises to respond to their countries' industrial needs.
			Be25	The learner is able to influence companies to become part of global partnerships for sustainable development.
Finance and Global operation	3 (Module 1)	• Business Finance • Managerial Accounting	Be 9	The learner is able to access financial services such as loans or microfinance to support their own enterprises.
	3 (Module 2)	• Operations Management • Import and Export Management • Cross Culture Communication and Management	Co 5	The learner understands how innovation, entrepreneurship and new job creation can contribute to decent work and a sustainability-driven economy and to the decoupling of economic growth from the impacts of natural hazards and environmental degradation.
			Co 6	The learner understands the concepts of sustainable infrastructure and industrialization and society's needs for a

Competency	Modules		ESD Learning outcomes	
	Grade	Courses	Code	Definition
Finance and Global operation	3 (Module 2)	• Operations Management • Import and Export Management • Cross Culture Communication and Management	Co 6	systemic approach to their development.
			Co 9	The learner knows the pitfalls of unsustainable industrialization and in contrast knows examples of resilient, inclusive, sustainable industrial development and the need for contingency planning.
			Co15	The learner understands the role of local decision-makers and participatory governance and the importance of representing a sustainable voice in planning and policy for their area.
			C 21	The learner understands global issues, including issues of financing for development, taxation, debt and trade policies, and the interconnectedness and interdependency of different countries and populations.
			Se 17	The learner is able to encourage others to engage in sustainable practices in consumption and production.
			Be11	The learner is able to plan, implement and evaluate community-based sustainability projects.

Competency	Modules		ESD Learning outcomes	
	Grade	Courses	Code	Definition
Finance and Global operation	3 (Module 2)	• Operations Management • Import and Export Management • Cross Culture Communication and Management	Be15	The learner is able to promote low carbon approaches at the local level.
			Be21	The learner is able to become a change agent to realize the SDGs and to take on their role as an active, critical and global and sustainability citizen.
			Be24	The learner is able to support development cooperation activities.
	3 (Module 3)	• International Business Entry Strategy • Strategic Management	Co 7	The learner understands the local, national and global challenges and conflicts in achieving sustainability in infrastructure and industrialization.
			Co15	The learner understands the role of local decision-makers and participatory governance and the importance of representing a sustainable voice in planning and policy for their area.
			Co18	The learner knows roles, rights and duties of different actors in production and consumption (media and advertising, enterprises, municipalities, legislation, consumers, etc.).

Competency	Modules		ESD Learning outcomes	
	Grade	Courses	Code	Definition
Finance and Global operation	3 (Module 3)	• International Business Entry Strategy • Strategic Management	Co20	The learner understands dilemmas/trade-offs related to and system changes necessary for achieving sustainable consumption and production.
			Co22	The learner understands the importance of global multi-stakeholder partnerships and the shared accountability for sustainable development and knows examples of networks, institutions, campaigns of global partnerships.
			Se 21	The learner is able to raise awareness about the importance of global partnerships for sustainable development.
			Be 8	The learner is able to innovate and develop sustainable enterprises to respond to their countries' industrial needs.
			Be22	The learner is able to contribute to facilitating and implementing local, national and global partnerships for sustainable development.
			Be25	The learner is able to influence companies to become part of global partnerships for

Competency	Modules		ESD Learning outcomes	
	Grade	Courses	Code	Definition
Finance and Global operation	3 (Module 3)	• International Business Entry Strategy Strategic Management	Be25	sustainable development.
International strategic practical application	3	• Cooperative Education in Business Administration		

Appendix VI: Experts' comments for the course design

Item	Expert	Experts' comments	Revision
5	B	The purpose of pre and post-test should provide in the assessment section.	The comment was adopted to the course design
7	B	The different perspectives of stakeholders such as the government and the local community should add to the content.	The comment was adopted to the course design
9	D	The activities of criticism and reflection should modify from the focus on individual behaviour to brand management.	The comment was adopted to the course design
12	B	The issues of SDGs in the economy and society should add to the content.	The comment was adopted to the course design
14	D	To delete the short answer questions of sharing the information of SD or responsible management issues which cause by a multinational corporation which can move to the content of business models.	The comment was adopted to the course design
17	E	The teaching contents of the challenges and opportunities of integrating sustainable development should focus on the perspective of Thailand and China.	The comment was adopted to the course design
19	B	The activities can add the discussion of business models.	The comment was adopted to the course design
20	C	The item of assessment of researching process execution should move to the activities section	The comment was adopted to the course design
22	F	To add the case study in the teaching contents.	The comment was adopted to the course design
23	F	To add the case study in the teaching methods.	The comment was adopted to the course design
27	D	To specific of what kind of ideas will promoting on the web platform.	The comment was adopted to the course design
29	A	The section of feedback should include in the activity of the final presentation.	The comment was adopted to the course design

Appendix VII**:** The course syllabus and lesson plan of PRME-based ESD

Students' learning outcome

Dimensions	Learning outcomes	From lesson plan Class No.	Assessment
Cognitive	• The learner knows about strategies and practices of sustainable production and consumption. • The learner understands the importance of global multi-stakeholder partnerships and the shared accountability for sustainable development and knows examples of networks, institutions, campaigns of global partnerships. • The learner is able to understand how one's own consumption affects working conditions of others in the global economy.	Class 1 and 2	• Pre-test of questionnaire • Pre-test of the test of knowledge of sustainability • Short answer questions • Short answer questions
Socio-emotional	• The learner is able to communicate the need for sustainable practices in production and consumption. • The learner is able to differentiate between needs and wants and to reflect on their own individual consumer behaviour in light of the needs of the natural world, other people, cultures and countries, and future generations. • The learner is able to feel responsible for the environmental and social impacts of their own individual behaviour as a producer or consumer.	Class 3 to 7	• Individual assignment • Group oral presentation

Dimensions	Learning outcomes	From lesson plan Class No.	Assessment
Behavioural	• The learner is able to engage with new visions and models of a sustainable, inclusive economy and decent work. • The learner is able to innovate and develop sustainable enterprises to respond to their countries' industrial needs. • The learner is able to become a change agent to realize the SDGs and to take on their role as an active, critical and global and sustainability citizen. • The learner is able to support development cooperation activities. • The learner is able to influence companies to become part of global partnerships for sustainable development.	Class 8 to 15	• Short answer questions • Experience report • Post-test of questionnaire • Post-test of the test of knowledge of sustainability • Group project performance

Reference Materials:

Honeyman, R., & Jana, T. (2019). *The B Corp Handbook: how you can use business as a force for good* (2nd ed.). Berrett-Koehler Publishers.https://books.google.co.th/books/about/The_B_Corp_Handbook_Second_Edition.html?id=MsB7DwAAQBAJ&redir_esc=y

Laasch, O. (2021). *Principles of Management: Practicing Ethics, Responsibility, Sustainability* (2nd ed.). SAGE. https://uk.sagepub.com/en-gb/eur/principles-of-management/book272405

McDonough, W., & Braungart, M. (2010). *Cradle to cradle: Remaking the way we make things*. North point press. https://books.google.co.th/books/about/Cradle_to_Cradle.html?id=KFX5RprPGQ0C&redir_esc=y

Porter, M. E., & Kramer, M. R. (2011, January-February). *Creating shared value.* Harvard Business Review. https://hbr.org/2011/01/the-big-idea-creating-shared-value

Rodríguez-Vilá, O., & Bharadwaj, S. (2017, September-October). *Competing on social purpose: Brands that win by tying mission to growth.* Harvard Business Review. https://hbr.org/2017/09/competing-on-social-purpose

Slidibe, M. (2020, May-June). *Marketing meets mission: Learning from brands that have taken on global health challenges.* Harvard Business Review. https://hbr.org/2020/05/marketing-meets-mission

Ulukaya, H. (2019, April). The anti-CEO playbook [Video]. TED. https://www.ted.com/talks/hamdi_ulukaya_the_anti_ceo_playbook?

White, K., Hardisty, D. J., & Habib, R. (2019, July-August). *The elusive green consumer: People say they want sustainable products, but they don't tend to buy them. Here's how to change that.* Harvard Business Review. https://hbr.org/2019/07/the-elusive-green-consumer

Lesson plan

Class No.	Teaching contents
1	• Introduction to the ERS: The effects of ERS development on the organization included the change of operation strategies.
2	• ERS in business: The relationship between ERS and brand management. The effects of ERS development on the individual included the role of the leader and global citizen.
3	• Shareholders and stakeholders: What is responsible management from stakeholders and shareholders perspectives.
4	• Brand and SDGs: Brand equity

Class No.	Teaching contents
5	• SD and brand positioning: The value of sustainable development in the brand positioning. The effects of sustainable development in production and consumption from different stakeholders' perspectives.
6	• SDGs in different contexts: Why SDGs is important for our society, economy, and environment. SDGs in the different regions and organizations.
7	• SD and brand loyalty: The influence of sustainable development and responsible management on consumers' green behaviour and brand loyalty. Brand identity with the context of sustainable development and responsible management. Introducing final project
8	• Business models: A social enterprise, B corporation, NGO
9	• SD perspective: The challenges and opportunities of integrating sustainable development in society and enterprises from Thailand and China perspective.
10	• SD and brand strategy.
11	• Real business world I: The implementation of sustainability and responsible management in the real business world.

Class No.	Teaching contents
12	• Real business world II: Brand management and sustainability
13	• Social purpose ideas: Finding social purpose for brand development.
14	• Brand strategy development: Developing a strategy for integrating sustainability and responsible management in real-world issues based on the social purpose.
15	• Final project performance

Appendix VIII: Outline of post-test interview schedule for experimental group students

Introduction: Thank you for being willing to take part in a follow-up interview to the PRME-based ESD course. I would first assure you that you will remain completely anonymous in the interview.

Part I: interview for cognitive learning outcomes

1. Who do you think is responsible for sustainable development?
2. Do you think businesses have a "mission" to improve environmental, social or economic issues?
3. What is your opinion of the following statement? Companies should sacrifice short-term profits to build cooperative relationships with stakeholders (such as competitors, suppliers and consumers) for long-term development.

Part II: interview for socio-emotional learning outcomes

1. Do you consider the issues of the brand's responsible management, ethics or environmental pollution when you purchase products or services?

   (a) If so, please describe your consumer experience.

   (b) If not, please move to the question 3.

2. Are the issues mentioned in the first question the main factors that affect your final purchasing decision?
3. Have you ever purchased products/services for ethical or environmental reasons, even though they were more expensive than others?
4. Do you think about future generations when using resources?

Part III: interview for behavioural learning outcomes

1. What is your opinion of corporate profit-sharing with employees?

2. Do you think business organisations are responsible for promoting a sustainable culture?

3. Do you support the promotion of a culture of sustainable development, even if it costs more (such as higher taxes)?

Part IV: interview for employability

1. Do you think the PRME-based ESD course was helpful for your knowledge and skills of business sustainability?

   (a) If so, please list the specific knowledge or skills that have helped you.

   (b) If not, please explain why.

2. Do you think the PRME-based ESD course was helpful for your employability?

   (a) If so, please list the specific factors that have helped to increase your employability.

   (b) If not, please explain why.

Appendix IX: Summary of the item analysis results

Nos.	Contents of Questions	Mean Value	Standard Deviation	*t*-Value of the Extreme Group	Relevance of the Total Number of Items after Correction	Cronbach's Alpha	Factor Analysis Method
1	CO19-1: Ecological footprint	3.81	1.170	*−6.085**	0.362	0.957	0.346
2	CO19-2: Consumer as a stakeholder	4.27	0.817	*−9.686**	0.554	0.955	0.537
3	CO19-3: The use of recycling material	4.46	0.801	*−8.644**	0.491	0.955	0.491
4	CO19-4: The use of packaging and disposable items	4.53	0.751	*−7.456**	0.565	0.955	0.585
5	CO22-1: Government's responsibility	4.55	0.687	*−7.480**	0.492	0.955	0.506
6	CO22-2: Government's role	4.58	0.645	*−8.644**	0.663	0.954	0.682
7	CO22-3: Mutually beneficial business relationships	4.42	0.702	*−11.608**	0.697	0.954	0.701
8	CO22-4: Cooperative market relationships	4.31	0.844	*−12.663**	0.675	0.954	0.669
9	SE3-1: Understanding the effects of personal consumption	3.54	1.183	*−4.756**	0.250	0.958	0.230
10	SE3-2: Personal responsible consumption	4.29	0.808	*−9.121**	0.542	0.955	0.528
11	SE3-3: Personal responsible consumption	4.34	0.952	*−6.822**	0.466	0.955	0.468
12	SE3-4: Encouraging responsible consumption	4.40	0.986	*−7.247**	0.527	0.955	0.523

Nos.	Contents of Questions	Mean Value	Standard Deviation	*t*-Value of the Extreme Group	Relevance of the Total Number of Items after Correction	Cronbach's Alpha	Factor Analysis Method
13	SE16-1: Communicating the consequences of economic practices on environment	4.05	0.851	*−6.749**	0.549	0.955	0.530
14	SE16-2: Personal sustainable practice in consumption	3.96	0.949	*−6.825**	0.520	0.955	0.512
15	SE16-3: Sustainable practice in production	4.29	0.878	*−12.366**	0.602	0.954	0.603
16	SE18-1: Reflection on individual consumer behaviour	4.43	0.757	*−9.504**	0.583	0.955	0.597
17	SE18-2: Save future generation	4.40	0.737	*−12.358**	0.692	0.954	0.703
18	SE18-3: Thinking about other people	4.12	0.878	*−9.623**	0.574	0.955	0.573
19	SE18-4: Consumer behaviour	3.82	1.075	*−9.465**	0.498	0.955	0.489
20	SE20-1: Awareness of the effects of individual consumer behaviour for the environment and society	4.14	0.903	*−12.010**	0.605	0.954	0.612
21	SE20-2: Awareness of the effects of individual consumer behaviour in sustainability	4.18	0.844	*−13.879**	0.703	0.954	0.695

Nos.	Contents of Questions	Mean Value	Standard Deviation	*t*-Value of the Extreme Group	Relevance of the Total Number of Items after Correction	Cronbach's Alpha	Factor Analysis Method
22	SE20-3: The practice of individual behaviour of responsible consumption	4.17	0.906	*−7.608**	0.556	0.955	0.566
23	SE20-4: Awareness of individual responsible beahviour	4.55	0.759	*−7.829**	0.579	0.955	0.597
24	BE1-1: Decent work	4.35	0.911	*−11.035**	0.564	0.955	0.584
25	BE1-2: Decent work	4.41	0.853	*−11.897**	0.678	0.954	0.702
26	BE1-3: Inclusive economy	4.40	0.796	*−13.207**	0.731	0.954	0.753
27	BE1-4: Inclusive economy	4.04	0.989	*−8.740**	0.515	0.955	0.523
28	BE8-1: Economic investment	4.42	0.738	*−11.903**	0.656	0.954	0.679
29	BE8-2: Innovate high-tech products	4.44	0.714	*−11.732**	0.700	0.954	0.735
30	BE8-3: Support research and development	4.43	0.731	*−10.589**	0.690	0.954	0.730
31	BE21-1: Individual role of citizen	4.13	1.089	*−7.445**	0.522	0.955	0.534
32	BE21-2: The essential of citizenship on sustainability	4.51	0.743	*−9.919**	0.688	0.954	0.724
33	BE21-3: To provide the help for others.	4.51	0.669	*−10.441**	0.587	0.955	0.621
34	BE21-4: A change agent for equal opportunities in society	4.53	0.802	*−9.267**	0.615	0.954	0.653

Nos.	Contents of Questions	Mean Value	Standard Deviation	*t*-Value of the Extreme Group	Relevance of the Total Number of Items after Correction	Cronbach's Alpha	Factor Analysis Method
35	BE24-1: The support of environmental protection	4.49	0.707	*−11.220**	0.717	0.954	0.752
36	BE24-2: Organisation activities for sustainability	4.56	0.685	*−9.169**	0.684	0.954	0.733
37	BE24-3: The support of policies for environment activities	4.51	0.639	*−10.962**	0.688	0.954	0.730
38	BE24-4: The support of university's initiatives	4.56	0.704	*−8.353**	0.636	0.954	0.676
39	BE25-1: Influencing company to develop sustainable culture	4.55	0.714	*−9.411**	0.684	0.954	0.734
40	BE25-2: Developing partnerships	4.55	0.658	*−10.932**	0.693	0.954	0.732
41	BE25-3: Developing partnerships	4.50	0.743	*−10.952**	0.577	0.955	0.598

Appendix X**:** The questionnaire of sustainability learning outcome in the English version

Cognitive learning outcome	
01.	I think that ecological footprint should be minimized for the continuation of the world's livability.
02.	Consumers should be deemed by organizations as partners in the development of advantageous solutions and fair price for both parties.
03.	Wastes should be separated according to their characteristics and reused, so that raw material sources can be used by future generations.
04.	Companies should have a responsibility to reduce the use of packaging and disposable items.
05.	Governments should adopt SD as a national priority.
06.	The government should take an active role in the global effort to curb the problem of rapid climate change.
07.	Organizations should build mutually beneficial business relationships with suppliers.
08.	Organizations should build cooperative market relationships with competitors so that everyone can operate in the market.
Socio-emotional learning outcome	
01.	I try to avoid buying goods from companies with poor track records on caring for their workers or the environment.
02.	I will not buy a product if the company which sells it is socially irresponsible.
03.	I encourage consumption of products not made by children, cheap labour.
04.	I think I can discuss the consequences of economic development on the environment.
05.	I choose certain products for ethical or environmental reasons, even if they are a bit more expensive.
06.	Taxes on polluters should be increased to pay for damage to communities and the environment.
07.	Every time we use coal, oil or gas we contribute to climate change.
08.	We must use current economic resources with conservation, thinking about future generations.
09.	When I see the poor conditions that some people in the world live under, I feel a responsibility to do something about it.
10.	I think that vehicles with the least impact on degradation of ecological balance should be preferred when buying one.
11.	I boycott products or companies for political, ethical or environmental reasons.
12.	Sustainability is important to me in making choices about which products or services I choose.
13.	When there is a choice, I always choose that product which contributes to the least amount of pollution.
14.	Every individual has responsibility to protect existing resources (water, air, soil etc.) for future generations to survive ecological problems.

Behavioural learning outcome

01.	It is right to boycott companies that are known to provide poor workplace conditions for their employees.
02.	Organizations should minimize risks to human rights that cause, for example, impacts on their own employees' and other people's health and well-being.
03.	SD requires businesses to behave responsibly to their employees, customers and suppliers.
04.	The practice of profit sharing with the working class should be considered an instrument of social justice.
05.	For economic investments, environments where life and property safety are provided must be established.
06.	The production of high-tech products for economic development should be supported.
07.	Research and development (R&D) studies for economic development should be supported.
08.	I think of myself as a citizen of the world.
09.	Good citizenship is necessary for SD.
10.	I do things that help people in need.
11.	Equal opportunities should be offered to individuals in society (women/men, rich/poor, race/religion etc.)
12.	Controls should be placed on industry to protect the environment from pollution, even if it means things will cost more.
13.	The work of governmental and non-governmental organizations involved in activities for the sustainable environment should be supported.
14.	Organizations should adopt policies for environment protection and preservation in all of their activities.
15.	I will support and participate in my university's initiatives to protect the environment.
16.	Organizations should encourage society to develop an environmentally sustainable culture.
17.	Organizations should maintain initiatives of communication and engagement with parties (internal groups, the government, NGOs, and the community).
18.	Organizations and competitors should form partnerships in order to protect the environment.

Appendix XI**:** The questionnaire of sustainability learning outcome in the Chinese version

认知	
01.	我认为应该最大限度地减少生态足迹，以延续地球的宜居性。
02.	我认为在开发有利的解决方案时，组织机构应该将消费者视为合作伙伴，以确立对双方都合理的价格。
03.	我们应根据废物特性对其进行分类并再次利用，后代才有机会继续使用原料资源。
04.	我认为企业有义务减少包装和一次性物品的使用。
05.	我认为政府应将可持续发展定为国家的优先事项。
06.	我认为在遏制快速气候变化的全球行动中，政府理应发挥积极作用。
07.	我认为组织机构应与供应商建立互惠互利的业务关系。
08.	我认为组织机构应与竞争者们建立市场协作关系，以便每个人均可在市场运作中发挥一席之地。
社会情感	
01.	我会尽量避免购买在 员工待遇、环境保护方面口碑不佳的公司产品。
02.	我不会购买不承担社会责任的公司销售的产品。
03.	我支持消费不利用童工或廉价劳动力生产的产品。
04.	我认为我能够探讨经济发展对环境产生的影响。
05.	我会出于道德或环境考量选择购买某些产品，即使它们价格稍贵。
06.	我认为应增加对污染者的税收，以弥补对社区和环境的损害。
07.	我们在使用煤、石油、或天然气时，都在影响气候变化。
08.	我们必须以保护的方式利用当前的经济资源，为后代着想。
09.	当我看到世上一些人身处窘境时，我觉得自己有义务做点什么。
10.	我认为在购买汽车时，应该优先考虑对生态平衡影响最小的车型。
11.	我会因为政治、道德或环境因素而抵制相关产品或企业。
12.	我在选购产品或服务时，其可持续性是我考虑的一个重点。
13.	当我需要做选择时，我会选对环境污染最小的产品。
14.	我认为人人皆有义务保护现有资源（水、空气、土地等），解决生态问题，造福子孙后代。
行为	
01.	我认为抵制为员工提供恶劣工作环境的公司是正确的。
02.	我认为组织机构应该最大限度地降低人权风险，例如：对内部员工或他人健康福祉造成的损害。
03.	我认为根据可持续发展的定义，企业需要对员工、客户以及供应商承担责任。
04.	我认为与工人阶级分摊利益的做法理应视为一种社会正义的手段。
05.	我认为经济投资必须保障生命安全和财产安全。
06.	我们应该支持促进经济发展的高新技术产品。
07.	我们应该支持促进经济发展的研发领域。
08.	我认为自己是世界公民。
09.	我认为可持续的发展需要良好的公民。
10.	我会帮助有需要的人。

行为	
11.	我认为社会中人人应该机会平等，无论男女、贫富、种族和信仰。
12.	我认为即使需要支付更高的成本，也应该对产业实施管制以保护环境免受污染。
13.	我们应该支持政府/非政府机构参与的可持续性环境发展工作。
14.	我认为组织机构应在其所有活动中采用环境保护政策。
15.	我会支持并参与我们大学保护环境的举措。
16.	我认为组织机构应鼓励社会形成环境可持续发展的文化。
17.	我认为组织机构需要保持与各方（内部团体、政府、非政府组织、及社区）的沟通与互动。
18.	我认为组织和竞争者们应结成伙伴关系，以便一起保护环境。

Appendix XII: The two-way specification table of the test in the main study

Cognitive learning outcomes	Knowledge dimension	Cognitive process dimension						Total number of questions
		1. Remember	2. Understand	3. Apply	4. Analyse	5. Evaluate	6. Create	
The learner knows about the strategies and practices of sustainable production and consumption.	Factual	4			1			5
	Conceptual		4					4
	Procedural	1		2		2		5
	Meta-Cognitive			1	1		1	3
The learner understanddds the importance of global multi-stakeholder partnerships and the shared accountability for sustainable developent and knows examples of networks, institutionns, campaigns of global partnerships.	Factual	3	1					4
	Conceptual		2				1	3
	Procedural				2	2		4
	Meta-Cognitive				1	3		4
Total number of questions		8	7	3	5	7	2	32

Appendix XIII: The test questions in English version in the main study

1.The unified standard formulated for the evaluation of green products in the market is one of the causes of improving consumer's purchasing behavior.

A. Yes

B. No

2. In recent years the importance of _____ has been advocated in the management orientation of a brand.

A. industrial production

B. product sale

C. social marketing

D. product marketing

3.Which of the following strategies should be applied by a brand in order to lower the negative impact in the face of COVID-19 pandemic?

A. establish a multinational supply chain and consolidate its original production advantage

B. strengthen the sales power to guarantee its market share

C. maintain the current organizational status and avoid wasting of resources

D. establish both the core value and image of empathy

4. Which of the following methods can be adopted when a brand is setting up its sustainable development plan?

A. provide sponsorship deals

B. provide stimulus schemes for consumption

C. provide industrial technological guidance

D. provide high-energy-consumption development projects

5. Which of the following ways can be used by a brand in order to stimulate consumers' behavior of purchasing green products?

A. alleviate consumers' sense of guilt

B. form a habit through both hints and feedback

C. purchase Internet keywords to increase the exposure of a product

D. emphasize the information of environmental disruption in advertising

6. Which of the following indicators is not included in ESG used to evaluate a brand's sustainable development?

A. environment

B. economy

C. society

D. governance

7. Which of the following strategies is not recommended if a brand plans to promote its brand equity among the consumers at the bottom of the Pyramid?

A. the model of large package, small profit and high sales

B. localization and tying of basic products

C. improvement in a product's additional service

D. establishment of consumer peer group

8. Which of the following strategies is not recognized by a brand to develop its circular economy?

A. develop the linear production model

B. develop the service of renting instead of buying

C. develop a product's recycling system

D. develop the interdisciplinary collaboration

9. Which production mode is adopted by a brand when it promises to use recycled materials to make shoes?

A. production mode of natural resources

B. production mode of intensive economy

C. production mode of circular economy

D. production mode of using, manufacturing and assembling

10. Which of the following is regarded as a social issue of ESG?

A. health and safety

B. risk management

C. resource management

D. salary system

11. Which of the following descriptions of sustainable development is correct?

A. It emphasizes that environmental protection is more important than economic development.

B. It emphasizes that social responsibility is more essential than profit creation for a corporation.

C. It highlights the coordinated development of society, economy and environment.

D. It highlights the coordinated development of politics, economy and environment.

12. Which of the following is not a reason for the rise of circular economy?

A. soaring price of raw materials

B. poor product design

C. gradually-growing economy

D. resource waste led by misplacement

13. Which of the following descriptions of circular economy is correct?

A. It is a linear economy.

B. It is an intensive economy.

C. It is an open system.

D. It is a closed system.

14. A brand claims its own products to be environmental-friendly recycled ones but refuses to disclose its source of raw materials to consumers transparently. In this case, what type of brand association would it cause?

A. preciseness

B. greenwashing

C. sustainability

D. authority

15. Which of the following issues is not necessary for a brand manager of cleaning products to consider when planning to establish the brand image of "friendly environment"?

A. how to cover the product in the market in the name of friendly environment

B. how to induce consumers' positive association towards the brand

C. whether inconsistent brand information can be avoided

D. whether consumers would regard it to be personally relevant

16.Which of the following issues needs no consideration when a brand is developing the "social purpose strategy"?

A. brand attributes

B. business adjacencies

C. design of suggestive images

D. stakeholder acceptance

17. Which of the following statements is correct concerning "greenwashing"?

A. unexpected risks with small probability

B. fake news deliberately released via green marketing

C. climate risks which are potentially beyond normal expectation

D. risks which are repeatedly reminded but receive inadequate attention

18. The goal of a brand's sustainable development is to increase its shareholders' profits.

A. Yes

B. No

19. Clean label is used to _____.

A. ensure a good working condition for employees

B. protect the trademarks as well as intellectual property rights

C. guarantee the recycling and reusing of raw materials

D. ensure the safety and information disclosure of food

20. Which of following practices is adopted when a brand is seeking its sustainable development through partnership?

A. cooperate with its consumers to establish a brand-discussion community

B. cooperate with multinational companies to employ cheap labor

C. work with intermediate business by authorizing the power of determining the price of raw materials

D. negotiate with the manufacturer to speed up production so as to launch a new product quickly

21. Which of the following methods can be used by a brand to achieve both profitability and sustainability?

A. establish a short-term investment plan

B. regard sustainability as a PR(public relationship) strategy

C. redesign its business model through interdisciplinary cooperation

D. imitate other companies' practice of implementing sustainable development activities

22. Which of the following strategies can be adopted by a brand of mineral water for the sake of sustainable development when the consistency of brand positioning is taken into account?

A. tackle the problem of food wastage by running leftover restaurants

B. improve the water quality by researching and developing products which can be used to purify water

C. manufacture environmental-friendly artificial fur by cooperating with industries which recycle used clothes

D. promote the solar power system by researching and developing solar energy devices

23. Which factor should be firstly considered when a social enterprise cooperates with a general one?

A. whether the cooperation could help build up organizational cohesion

B. first to consider the market opportunity than further to clarify the social goals

C. whether the contract amount could bring stable incomes

D. decide on the basis of investors' opinions

whether to cooperate

24.In order to solve the employment issue for disadvantaged groups, Jack has founded a self-financing and self-sufficient company without the system of shareholder bonuses. What kind of business model does this company adopt?

A. non-profit organization

B. B Corporation

C. social enterprise

D. limited company

25. Which of the following descriptions is correct concerning B Corporation?

A. Corporate profitability is not emphasized.

B. Performance is certified by the government.

C. Profits are shared with employees, communities and suppliers.

D. The starting point of founding a corporation is to solve social or environmental issues.

26.Which of the following descriptions is incorrect concerning B Corporation and social enterprise?

A. The two use their respective enterprise revenue differently.

B. Both of them emphasize the corporate transparency.

C. The operation purpose of both is to solve social issues.

D. The global private companies of both are entitled to apply for establishment.

27. A coffee brand cooperates with small-holding peasants by offering reasonable prices for their coffee beans and meanwhile stipulating that child labor is forbidden. What kind of trade relationship does this brand establish?

A. regional economic partnership

B. fair trade relationship

C. free trade relationship

D. bilateral trade relationship

28. Which of the following measures contributes to Unilever's success in conveying its brand equity when it chooses "Soap Campaign" as a key plan?

A. promote brand growth through sales

B. enhance brand awareness through publicity

C. gain profits by ameliorating problems

D. promote brand value by raising shareholders' profits

29. Distortion of the market price is a defect of fair trade.

A. Yes

B. No

30. Which of the following measures can be adopted when a brand attempts to drive its brand growth by creating social values?

A. advance the development of local clusters

B. advance the development of nationalism

C. speed up producing and manufacturing

D. prosper consumer demand

31. A certain brand attempts to achieve the goal of shared value with its customers by resolving social problems. Why does this brand set such a goal?

A. It is a way of building the socially-responsible image.

B. It is a way of founding a charitable organization.

C. It is a way of establishing the risk management.

D. It is a way of achieving economic success.

32. Which of the following descriptions is correct concerning ISO?

A. the certificate authority which formulates the planning and managing of enterprise resources

B. the certificate authority which formulates the international standard for the worldwide industry and commerce

C. the certificate authority which formulates the data analysis of business intelligence creation

D. the certificate authority which formulates the solution analysis of product and service

Appendix XIV: The test questions in Chinese version in the main study

1. 市场上对于绿色产品的评鉴具有统一的标准，是提高消费者购买行为的原因之一。

A：是

B：否

2. 近年来，品牌的经营导向主张_____的重要性？

A：工產生产

B：产品销售

C：社会营销

D：产品营销

3. 品牌在面临新冠疫情的挑战下，应运用下列何种策略来降低冲击？

A：建立跨国供应链, 巩固生产优势

B：增加推销力道, 已确保市场份额

C：维持组织现况, 避免资源的浪费

D：建立同理心的价值要素和形象

4. 品牌可藉由以下何种方法, 建立可持续发展计画？

A：提供捐赠方案

B：提供刺激消费方案

C：提供产业技术指导

D：提供高耗能的发展项目

5. 品牌可利用下列何种方法, 提高消费者购买绿色产品的行为？

A：减轻消费者的罪恶感

B：运用提示与反馈意见建立习惯

C：购买互联网关键字, 加大产品曝光率

D：在广告宣传中强调环境被破坏的信息

6. 评估品牌永续发展指标的 ESG 不包含下列哪一项？

A：环境

B：经济

C：社会

D：治理

7. 某品牌欲针对金字塔底层的消费者发展品牌权益，请问下列何者不是应运用的策略？

A：大容量包装、薄利、多销

B：基本产品在地化和搭售

C：提高产品附加服务

D：建立顾客同侪团体

8. 下列何者不是品牌发展循环经济策略的方法？

A： 发展线性生产模式

B： 发展以租代买的服务

C： 发展产品的回收系统

D： 发展跨领域合作机会

9. 一家生产鞋子并承诺使用回收物料的品牌正在使用_____的生產方式？

A：自然资源生产法

B：集约经济生产法

C：循环经济生产法

D：使用, 制造, 组装的生产法

10. 下列何者是属于 ESG 中的社会问题？

A：健康安全

B：风险管理

C：资源管理

D：薪酬制度

11. 下列关于可持续发展的描述何者正确？

A：强调环境的保护比经济发展更重要

B：强调企业社会责任比创造利润重要

C：重视社会、经济和环境的协调发展

D：重视政治、经济和环境的协调发展

12. 下列何者不是循环经济兴起的原因？

A：原物料价格飙涨

B：产品设计不良

C：经济逐渐增长

D：资源错置导致浪费

13. 下列关于循环经济的描述何者正确？

A：是一种线性经济

B：是一种集约型经济

C：是一种开放型系统

D：是一种封闭型系统

14. 某品牌宣称自家产品为环保回收产品，但却拒绝对消费者透明公开原物料来源，请问该行为会造成何种品牌联想？

A：严谨

B：漂绿

C：永续

D：权威

15. 某清洁产品品牌想建立「友善环境」的品牌形象，请问下列何者不是品牌经理人应该考量的问题？

A： 如何以友善环境名义, 掩护产品营销策略

B： 如何引发消费者对品牌的正面联想

C： 是否能避免产生不一致的品牌信息

D： 是否能被消费者视为与个人切身相关

16. 下列何者不是品牌在发展「使命策略」时应该考量的问题？

A： 品牌特性

B： 事业邻近性

C： 暗示性圖像的設計

D： 利害关系人的接收度

17. 下列关于「漂绿」的描述何者正确？

A： 出乎意料发生的小概率风险事件

B： 利用绿色營銷特意釋放虛假訊息事件

C： 可能超出正常預期範圍的氣候风险事件

D： 经常被提示却没有得到充分重视的风险事件

18. 品牌的可持续发展目标是增加股东利润。

A：是

B：否

19. 洁净标章的用途是_____ 。

A：保障員工拥有良好的工作环境

B：保护商标及智慧财产权

C：保障原物料的循環再利用

D：保障食品的安全及資訊公開

20. 下列何者是品牌藉由合作关系建立可持续发展的做法？

A：与消费者合作建立品牌讨论社群

B：与跨国企业合作雇用廉價勞工

C：与中间商合作, 给于决定收购原物料价格的权力

D：与制造商协议加快生产速度, 以便快速推出新产品

21. 品牌可利用下例何种方法兼顾获利与永续性？

A：建立短期投资计画

B：将永续性视为公关策略

C：跨领域合作重新设计商业模式

D：仿效其他企业推行永续发展活动

22. 在考量品牌定位一致性的情况下，贩售矿泉水的品牌可利用下列何种策略发展可持续计画？

A：开设剩食餐厅, 解决食物浪费问题

B：研发能净化水源的产品來改善水質

C：与旧衣回收产合作, 生产环保人造皮草

D：研发太阳能设备, 推动太阳能发电系统

23. 当社会企业与一般企业合作时，必需先考量_____。

A：此合作关系是否能建立组织凝聚力

B：先考虑市场商机, 再厘清社会目标

C：合同金额是否能带来稳定收入

D：以投资人的意见为主, 决定是否进行合作

24. 小明为了解决弱势团体的就业问题，成立了一间自负盈亏、自己自足，且没有股东分红制度的公司。請問此公司是採用下列何种商业模式？

A：非营利组织

B：B 型企业

C：社会企业

D：有限公司

25. 下列关于 B 型企业的描述何者正确？

A：不强调企业获利

B：绩效表现由政府认证

C：和员工、社区、供应商共享利润

D：解决社会或环境问题为企业成立出发点

26. 下列关于 B 型企业和社会企业的描述何者错误？

A： 两者的企业营收用途不同

B： 两者都强调企业透明度

C： 两者的经营目的都是解决社会问题

D：两者全球私人企业都可申请成立

27. 某咖啡品牌与小农合作，保障给予良好的咖啡豆收购价格，并且规定小农不可雇用童工，请问该品牌是建立了何种贸易伙伴关系？

A：区域经济关系

B：公平贸易关系

C：自由貿易关系

D：双边貿易关系

28. 联合利华以「香皂运动」做为传达品牌资产的重要计画，请问下列何者是该计画成功的原因？

A： 透过销售推动品牌成长

B： 透过宣传提升品牌知名度

C： 透过改善问题而获得利润

D： 透过提升股东获利推动品牌价值

29. 扭曲市场价格是公平贸易的缺点。

A：是

B：否

30. 某品牌想藉由创造社会价值来带动品牌成长，请问下列何者是该品牌可采用的做法？

A：促进地方群聚发展

B：促进民族主义发展

C：促进生产制造速度

D：促进消費者需求

31. 某品牌藉由解决社会问题，达到与顾客共享价值的品牌目的，请问为什么要建立「共享价值」的品牌目的？

A： 是建立社会责任形象的方法

B： 是建立慈善组织的方法

C： 是建立风险管理的方法

D： 是取得经济成就的方法

32. 下列何者对「ISO」的描述正确？

A：制订企业资源规划及管理的认证机机构

B：制订全世界工商业国际标准的认证机构

C：制订商业智能创造数据分析的认证机构

D：制订产品与服务解决方案分析认证机构

Appendix XV: Results of Johnson-Neyman procedure of the cognitive learning outcome of the questionnaire

Variable					
Pre-test of cognitive	Effect	95% CI [*LL*, *UL*]	*SE*	*t*	*p*
3.000	1.02	[0.61, 1.43]	0.20	4.93	.000
3.100	0.96	[0.58, 1.34]	0.19	5.00	.000
3.200	0.90	[0.54, 1.25]	0.17	5.07	.000
3.300	0.84	[0.51, 1.17]	0.16	5.15	.000
3.400	0.78	[0.48, 1.08]	0.15	5.22	.000
3.500	0.72	[0.45, 0.99]	0.13	5.29	.000
3.600	0.66	[0.41, 0.91]	0.12	5.33	.000
3.700	0.60	[0.38, 0.83]	0.11	5.34	.000
3.800	0.54	[0.34, 0.75]	0.10	5.28	.000
3.900	0.48	[0.29, 0.67]	0.09	5.11	.000
4.000	0.43	[0.25, 0.60]	0.09	4.79	.000
4.100	0.37	[0.19, 0.54]	0.08	4.29	.000
4.200	0.31	[0.14, 0.48]	0.08	3.61	.001
4.300	0.25	[0.07, 0.43]	0.08	2.83	.006
4.400	0.19	[0.00, 0.38]	0.09	2.04	.043
4.408	0.18	[0.00, 0.37]	0.09	1.98	.050
4.500	0.13	[−0.06, 0.33]	0.10	1.31	.191
4.600	0.07	[−0.14, 0.29]	0.11	0.67	.500
4.700	0.01	[−0.22, 0.26]	0.12	0.13	.890
4.800	−0.04	[−0.31, 0.22]	0.13	-0.30	.759
4.900	−0.10	[−0.39, 0.19]	0.14	-0.67	.499
5.000	−0.16	[−0.48, 0.16]	0.16	-0.98	.327

Note. *N*= 96. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

Appendix XVI: Results of Johnson-Neyman procedure of the socio-emotional learning outcome of the questionnaire

Variable					
Pre-test of socio-emotional	Effect	95% CI [*LL*, *UL*]	*SE*	*t*	*p*
2.500	1.00	[0.57, 1.42]	0.21	4.69	.000
2.625	0.93	[0.54, 1.33]	0.19	4.74	.000
2.750	0.87	[0.51, 1.24]	0.18	4.79	.000
2.875	0.81	[0.48, 1.15]	0.16	4.84	.000
3.000	0.75	[0.44, 1.06]	0.15	4.88	.000
3.125	0.69	[0.41, 0.97]	0.14	4.92	.000
3.250	0.63	[0.37, 0.88]	0.12	4.94	.000
3.375	0.57	[0.34, 0.80]	0.11	4.93	.000
3.500	0.51	[0.30, 0.72]	0.10	4.86	.000
3.625	0.45	[0.25, 0.64]	0.09	4.68	.000
3.750	0.38	[0.21, 0.56]	0.08	4.36	.000
3.875	0.32	[0.15, 0.49]	0.08	3.86	.000
4.000	0.26	[0.10, 0.43]	0.08	3.19	.002
4.125	0.20	[0.03, 0.37]	0.08	2.39	.018
4.188	0.17	[0.00, 0.34]	0.08	1.98	.050
4.250	0.14	[−0.03, 0.32]	0.09	1.59	.115
4.375	0.08	[−0.11, 0.27]	0.09	0.84	.400
4.500	0.02	[−0.19, 0.23]	0.10	0.20	.838
4.625	−0.03	[−0.27, 0.19]	0.11	-0.32	.744
4.750	−0.10	[−0.36, 0.16]	0.13	-0.76	.448
4.875	−0.16	[−0.44, 0.12]	0.14	-1.11	.268
5.000	−0.22	[−0.53, 0.09]	0.15	-1.40	.164

Note. *N*= 96. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

Appendix XVII: Results of Johnson-Neyman procedure of the behavioural learning outcome of the questionnaire

Variable Pre-test of behavioural	Effect	95% CI [*LL*, *UL*]	*SE*	*t*	*p*
3.000	0.77	[0.35, 1.19]	0.21	3.67	.000
3.100	0.72	[0.33, 1.11]	0.19	3.69	.000
3.200	0.68	[0.31, 1.04]	0.18	3.71	.000
3.300	0.63	[0.29, 0.97]	0.17	3.73	.000
3.400	0.59	[0.27, 0.90]	0.15	3.73	.000
3.500	0.54	[0.25, 0.83]	0.14	3.73	.000
3.600	0.49	[0.23, 0.76]	0.13	3.72	.000
3.700	0.45	[0.20, 0.69]	0.12	3.68	.000
3.800	0.40	[0.18, 0.63]	0.11	3.60	.001
3.900	0.36	[0.15, 0.56]	0.10	3.47	.001
4.000	0.31	[0.12, 0.50]	0.09	3.26	.002
4.100	0.26	[0.08, 0.44]	0.09	2.96	.004
4.200	0.22	[0.04, 0.39]	0.08	2.54	.013
4.300	0.17	[0.00, 0.34]	0.08	2.04	.044
4.310	0.17	[0.00, 0.34]	0.08	1.98	.050
4.400	0.13	[−0.04, 0.30]	0.08	1.48	.142
4.500	0.08	[−0.09, 0.26]	0.09	0.91	.362
4.600	0.03	[−0.15, 0.23]	0.09	0.39	.696
4.700	−0.00	[−0.21, 0.20]	0.10	−0.07	.945
4.800	−0.05	[−0.28, 0.17]	0.11	−0.46	.646
4.900	−0.09	[−0.35, 0.15]	0.12	−0.78	.434
5.000	−0.14	[−0.41, 0.12]	0.13	−1.05	.294

Note. *N*= 96. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.

Appendix XVIII: Interview transcriptions.

- The example 1 of interview transcriptions

访问者：	现在社会上一直在谈论例如说永续，或者是可持续发展，你觉得这件事情是谁的责任？
受访者：	是什么？ 这边有点卡。
访问者：	是谁的责任？
受访者：	我认为这件事情应该是政府和一些像，比如说类似于社会上面一些公司，还有一些民众的责任。 民众也是有责任的。 我大概意思应该是说，就是大家都有责任吧。 大概是这样。
访问者：	了解。
受访者：	主要责任还是比如说像政府，还有一些大公司。 这些责任可能会比较重。 因为他们比较有资源。
访问者：	那你觉得比如说这些大企业，不管大企业还是小企业，他们是不是有一些义务或是使命，要去改善现在环境、社会或者是经济的问题？
受访者：	经济的问题吗？
访问者：	不管是经济的问题也好，或是社会上或是环境。 你觉得他们有这样子的义务或是这样子的使命必须要去改善吗？
受访者：	我认为他们有这个义务，因为他们是大企业可以给大家做一个领导模范的作用。 因为大公司肯定是比其他的一些小公司或者一些民众，比较有实力的。 我认为他们应该是有这个义务要去改善一下环境啊，什么的。 这么认为。
访问者：	那你觉得如果我们今天，假设企业要去做这些事情，可能他会牺牲短期的一些利润，比如说我可能要跟供应商或是竞争者去建立合作关系，牺牲短期利润，为了要更长久的发展。 你对这个有什么样子的看法？
受访者：	那我会很支持这个企业，因为他们如果肯牺牲自己的利润去改善，那我是非常支持的。 因为我觉得企业正常应该是以公司的利益为主的，如果他们愿意去给社会去改善这些环境、民众，那我肯定是大力支持的。
访问者：	那你觉得如果今天你是企业老板的话呢？ 你对这个有什么看法？
受访者：	那我觉得如果说不妨碍公司利益的情况下，我觉得做这个是好事，是利好的。
访问者：	那你有没有曾经，比如说你在买东西的时候、你在消费的时候，你会去考量这个产品，或者是这一个服务、这个品牌，他有没有造成环境的污染，或是一些道德啊，或是不负责任的这些问题，你会去想到吗？

受访者： 会。 因为就像之前疫情的那段时间，不是有一个企业，就是因为他们专门有招一些残疾人来做他们的员工，这个事情被报爆光来之后我就会尽力去支持他们的产品。 因为他们做得都是有利于社会、帮助社会这样子的，那我会尽力去支持。 反之，如果说有一些企业，以污染环境作为代价的话，我肯定是不去支持他们的，肯定是不会去购买他们的产品。

访问者： 所以这个会是影响你最后决定买不买东西的主要原因吗？

受访者： 这个的话，那我首先要看他们产品，还有一个就是如果他们的口碑真的很差的话，那我就不会去考虑。 如果说一个是没有做过，然后还有一个是做的..... 就是在他们产品，同样的情况下，一个是有做过类似这方面的保护环境或什么的，另外一个是没有做过保护环境这些的，那我肯定会优先选择做过的那个。

访问者： 那你有没有曾经买过某一个东西或是服务，因为他是有做过这一些，假设他很重视人、很重视员工或是环境，可是它的东西比较贵，你有没有曾经买过？

受访者： 东西比较贵，我买是有买过，但是我不记得，好像有买过。 因为比较贵的东西专门去买得好像没有。

访问者： 喔，没有是不是？

受访者： 这个我不太记得了。

访问者： 好，谢谢。 那你觉得我们现在在使用资源的时候，需不需要替后代着想？

受访者： 需要啊，这个肯定需要。 因为如果我们这一代没有好好保环境的话，那这样的话像我们的下一代、子孙后代肯定会受到这些东西、受到环境的污染，然后生活变得不好。

访问者： 那你觉得你对于企业它赚到的利润跟员工共享，这个想法你有什么看法？

受访者： 我觉得这个想法很为员工着想，但是应该比较少有企业会这样做吧？

访问者： 就是说你觉得执行上可能会有一点困难，太理想化了是不是？

受访者： 对，我觉得比较理想化。 因为像一个，特别像是那种大的公司，股东肯定是有很多嘛，公司不是一个人的，那我觉得这个可能不太容易执行。

访问者： 了解。

受访者： 但我觉得如果能做下去的话，肯定很好。

访问者： 那你觉得我们在推动永续还是可持续这样子的文化的时候，你觉得它是企业的责任吗？

受访者： 我觉得是吧。

访问者： 是，是不是？ 就是他们扮演很重要角色要去推动是吗？

受访者 ： 恩。

访问者： 那假设今天比如说我们政府或是企业，他说我们现在要推动这样子的一个事情，可是我们对于民众来讲，我们必须要支付比较高的成本，我们税收要提高，你觉得你会支持吗？

受访者 ： 看提升的幅度吧？ 如果不是特别高的话肯定是支持的; 但如果太高的话，像比如说我们民众生活可能负担也比较严重的话，那可能就不一定那么支持吧。

访问者： 那你觉得在我们这一次上完课程之后，你觉得对于你在商业发展的..... 比如说永续或是可持续的，不管是知识或是技能，对你有没有什么帮助？

受访者 ： 像我以后，这堂课上完以后，我肯定是有，会关注这些东西。 像什么有做这些的大企业或是什么的，我肯定会尽力去支持它们的产品。

访问者： 那你觉得对你的知识面有没有什么提升？ 或是，就是任何方面，对你来说有没有帮助，或是提升？

受访者 ： 有啊，如果说我以后有创建公司的话，积累到一定程度之后肯定会开始做这些东西的。 因为这个做得是有意义的存在，还有一个是，做这些东西也可以给公司提高像是广告一样的作用，那我肯定是会用到的。

访问者： 了解。 那你觉得这个方面的知识或是技能，对你在职业能力的提升有没有什么帮助？

受访者 ： 帮助的话，就是..... 肯定是有的吧。 我会尽量去往这方面考虑，我会去多花更多的时间去关注这些东西。

访问者： 你是说如果你在找工作你也会去看这个公司是不是，比如说有没有可持续发展的策略吗？

受访者 ： 就算没有做这方面的工作，我就会如果说我现在的公司，那我就会引领他们往这个方面去发展一下。

访问者： 了解。 非常谢谢你这个宝贵的时间。

受访者 ： 好，再见。

- The example 2 of interview transcriptions

访问者： 你觉得像我们在现在社会很多新闻，或者是在上课我们也有提到这个可持续或是永续的概念，你觉得这个是谁的责任？

受访者 ： 嗯... 老师你是说这个永续是谁的责任？ 还是说造成这个局面是谁的责任？

访问者： 就是永续或者是可持续发展，你觉得这是谁的责任？

受访者 ： 其实我认为是所有人的责任，因为确实是所有的品牌，就是那个环境污染，包括过度的使用这些东西都是，其实最根本的原因就是人口，就是换句话说，在这个环境污染这一方面，其实我们每个人都有那个问题。

访问者： 了解。

受访者 ： 就是，其实这是一个偏，就是哲学方面，就是你可能没做什么，但是你的存在就是一个问题，就是挺悲观的，但是这也是一个现实，所以说像什么可持续、永续，其实都是我们所有人的责任，这是我的想法。

访问者： 像现在我们大家都会讲到，就是说企业要去做这些事情，或者是甚至有人会觉得说企业有义务去做这个事情，对你来说你觉得，企业是真的有一定要做这种，像我们在讨论说，这种使命去改善环境、社会或是经济问题，你觉得企业真的有这样的使命或是义务吗？

受访者 ： 其实这个，也就像相当于是那个所谓的领头羊效应，就是说真正的环保、可持续发展的那个普及是单单靠什么书，那个包括什么宣传，其实是不够的，还是需要一些领头羊出来说做一些表率或者做一些什么，其实你要说有没有义务？ 没有，不会，没有说是强制的要求什么什么，但是其实我认为企业应该去做这些东西，因为你去，别人买你的东西，然后通过买你的东西来了解到这些，这些方面，其实是比较就是说你在电视上面，就放一个广告说什么可持续发展人人有责这个东西要好很多。

访问者： 那像你觉得可能我们，那如果假设我们今天在做这一些发展的时候，通常，或许都会牺牲短期的利润，可能我要投资下去，然后我要做一些改革，那你，或者是我要去跟供应商建立一些合作关系，那你觉得为了要朝这样子的发展牺牲短期利润，你对这个有什么看法？

受访者 ： 其实这一个东西如果就我来说的是，不是很介意的，但是你要真的说，毕竟每个人都不一样，你完全用那个强制要求的话，确实会造成反效果，但是对我而言的话，其实是我是满支持的，因为短期利润来说，没什么，就往后面想，我，每个人也都会有自己的后代，就再想想你愿意把现在这种环境的问题，这些抛给你下一代吗？ 反正我是不太愿意的，你要我抛弃一下短期利益，然后给就是我的自己的孩子一个相对较良好的环境，其实我，在我看来是值得的。

访问者： 那像以你自己，譬如说你之前在消费的过程，你可能买，买一些东西的时候，你有没有曾经去考量到某一个品牌它是否有对社会造成一些不好

的负面的话题，或是对员工不好、不负责任管理，你有曾经在买东西的时候有考量到这一点吗？

受访者：这一点，怎么说呢？ 就是我会去了解，就是我不是一个特别就是主动喜欢去看新闻的人，我更多的接触的消息都是有点偏被动的，就包括在那个刷视频上才得知，或者是什么的时候，我很少去那个，譬如说那些新闻上面去看，所以说有可能会就是延迟，会有些延迟，就是我可能买了这个东西之后，我才知道他们会去做了什么东西，就会去做了什么，然后所以说，如果我知道了，我不会去买， 但是如果说我已经买了，所以已经有点，对吧。 你也不可能说直接放在那里不用。

访问者：对，那它会不会变成说，你觉得它会变成是影响你去最终到底有没有购买的一个主要原因吗？ 会不会是主要原因？

受访者：嗯，会，就是因为其实我挺感性的，我，怎么，怎么，譬如说什么新疆棉，譬如说那个什么那些乱七八糟的，东西，其实那个东西出来之后，我对这一个品牌的那一个好感度基本上就是，就基本上降到已经说是一定地步了，就是一个没有，一个不是，就是对我们友好的品牌，我也不会去对你友好，就是这种感觉。

访问者：了解，那你觉得，那你有没有曾经有就支付比较，你知道，你知道某一个东西它是比较贵的，可是你觉得它这个东西是很，对社会或是对环境它是很好的，然后你去购买它，即便它比较，你知道它已经比较贵？

受访者：因为我，我不是一个就是特别喜欢买东西的人，我是那种，就是宅男嘛，反正我的，一般就是东西如果说是没有用完或者是坏了话就，就先，就先用着嘛，就像这个，我现在，我现在跟您聊天，就是用的这个手机也是用了四年了，四、五年了，也没打算去换，因为它还能用，所以说，我买东西也不会去挑那些个什么特别昂贵的东西去买。

访问者：就是对你来说够用就可以了。

受访者：对对对，比如说，比如说那个牙膏，比如说那个牙膏的杯子，那一些我会去，有意识去挑那一些就是什么，就是洁感制成的杯子，对吧，那一些我会有意识的去挑，因为我觉得，其实可重复利用，然后利用出来的东西给我，我现在在使用这些东西，其实挺有意思的，所以在我看来就是使用这些东西，其实有意思，而且对我来说是有意义的。

访问者：谢谢，那像你，你对于譬如说企业利润，就是企业赚的利润跟员工共享，这一种概念你有什么看法？

受访者：嗯... 太过于理想了，就是你可以说，你可以，我，我觉得这种东西它的存在是好的，但是其实这个东西我觉得它只能是一个概念，它不可能说是，长久的流传下去，你要说的话，你自己在位的时候，你是这个企业的就是话事人，那么你可以说是通过什么什么去做下去，但是如果你不在的话，嗯，我不是很相信你说，就是你的下一任继承者能完整的来继承你的所有的思想， 然后你很难保证你不再掌管这个公司的时候，这个

公司还是会按照像什么社会企业，企业那种发展下去，毕竟，毕竟你成立一个企业，它的核心目的是赚钱。

访问者： 了解。

受访者： 如果获利，所以说核心都还是回到了利益，如果利益不存在的话，没有必要去做这些东西，就是很多人就会觉得没有必要去做东西，然后所以说企业就不转型。

访问者： 了解，像你觉得，像我们说这种可持续或是永续的概念，其实它就是一种文化，就是我们要推广它才能变成一种大家都能够接受的东西，那你觉得在推动这个方面，是不是企业组织的责任？

受访者： 嗯... 推动这方面，企业应该不是主责任吧，真正主责任的不应该是政府吧。

访问者： 你觉得是应该是以，以角色来讲应该是以台当局来主导是不是？

受访者： 因为，因为企业它终究还是归于个人的，然后国家才，从政府的角度来说才是，就是它的背景，然后包括它的什么才比较深厚，就是说你一个企业去搞这些东西是当然可以的，然后也是好事，那如果说你想长久的，或者说是大力的宣传的话，嗯... 以一个企业的背景是不够的，以一个企业的力量是不够的，所以说还是得要和政府，然后靠有政府背书之后，你才能比如说更好的去宣传、去发展。

访问者： 那像你觉得，假设今天政府推动说，我们为了要保护，保护下一代，要往永续发展，然后我们最，我们的这个税收要提高，你觉得你愿意去支付吗？ 就是我们要付更高的成本去发展这个，这个概念？

受访者： 这我是，怎么说呢？ 就是，一半接受，一半不接受吧，我是，就是我可能有点悲观的原因，不是很愿意把，我不是很愿意把就是本该由我们去做的事情，然后全部交给别人，我仅仅给了你的钱，然后你真的拿，会拿这笔钱去做这件事情的话，我会给你，我会，我会挺，挺乐意的，但是我真的不能确定。

访问者： 了解，就是你要能够。

受访者： 如果你能。

访问者： 你说。

受访者： 对，你能给我做到公正公开，或者是说做到透明的话，其实我乐意交这笔税的，因为我刚才也提过就是说，我还是不愿意把现在这种问题直接抛给下一代嘛，但是，嗯... 你没办法做到完全的公开或者透明，所以说，其实挺复杂，我既愿意交，然后又不愿意就是说全权交给别人，让别人用了我的钱去贪污啊，或者去什么，就是有点，有点奇妙的心理洁癖吧可能是，我觉得应该这么说。

访问者： 就是等于说觉得信任感不是那么够，就是我钱交了，到底你有没有做，这个是一个你觉得最重要的地方。

受访者： 对，其实这就是属于什么？ 这就是属于一个，反正我现在也没进入社会，有点偏那种钱，有点钱的感觉，比如说现在这么长的话，我会，我会这么说，可能如果说放十年以后可能不会这么说了吧。

访问者： 那像就我们这一次课堂里面，老师也有就是请到一些校外的讲师，然后有提到关于这一个商业加上永续发展的这个概念，那你觉得在上课完之后，对你的知识或者是技能有没有什么帮助？

受访者： 是有帮助的，因为，嗯... 就是，很多，很多关于这个，这个企业的永续发展、可持续发展，说实话你如果不上课的话，很多人都是一知半解的，就是你说这个企业做什么做什么做什么，可能只是简简单单听一下就过去了，然后你只有系统的学习一些知识之后，你才能会对这些东西有更深的理解，所以说我觉得上这个课程挺有必要的，也是，也是应该去弄的，因为你不去系统的学习相关的知识， 你去听他们那个，那个像可口可乐做了北极熊计划，你就听一听，你觉得支持，但是你没有看，看不到它背后它所想表达的涵意，或者是这个企业它为什么要这么做，为什么要用这种方式来，就是它怎么能样提升自己，所以说还是要学一下，你最起码了解，就像其实我属于那一种就是，我可能说是学得不好， 但是我觉得稍微了解一下也是好的这种人。

访问者： 那像你觉得这方面对你的职涯或者是就业能力是有帮助的吗？

受访者： 有吧，其实，有吧，我不敢确定，因为我没有找工作嘛，我现在就是坐在，坐在这个电脑前面，然后拿着这一个跟您说话，然后我也没出去就是说找工作，我也没什么，我现在干过最大的工作就是发过传单，所以说我不是很确定这个东西到底对不对我有帮助，但是从就是本心上，还有就是本意上来讲，我是有的，我觉得这种东西它能帮我把眼界拉高，然后再去那个公司， 或者说是以后该干什么的时候就有点那个啥，有一点自己的想法和抉择这方面。

访问者： 了解，非常谢谢你参与今天的访谈。

受访者： 嗯 再见。