A Conceptual Framework for Evaluating Key Competencies of Sustainability in the Higher Education Curriculum:
Case Study of Ritsumeikan Asia Pacific University

By

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Master Thesis Research presented to Graduate School of Asia Pacific Studies, Ritsumeikan Asia Pacific University, in partial fulfillment of the requirements for the Degree of Master in International Cooperation Policy majoring in Sustainability Science.

September, 2018

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LIST OF ABBREVIATIONS

AACSB	Association to Advance Collegiate Schools of Business
AHELO	Assessment of Higher Education Learning Outcomes
AISHE	Auditing Instrument for Sustainability in Higher Education
AOL	Assurance of Learning
APM	College of International Management
APS	College of Asia Pacific Studies
APU	Ritsumeikan Asia Pacific University
CEA	Certified evaluation and accreditation
CLA	Collegiate Learning Assessment
CSM	Culture, Media and Society
DESD	Decade of Education for Sustainable Development
ED	Environment and Development
EFA	Education for All
EFSC	Evaluative Framework for Sustainability Competencies
ELIAS	Environmental Leadership Initiatives for Asian Sustainability
ESD	Education for Sustainable Development
GAP	Global Action Programme/Plan
HE	Higher Education
HEIs	Higher Education Institutions
JACA	Japan Association for College Accreditation
JIHEE	Japan Institution for Higher Education Evaluation
JNCU	Japan National Commission for UNESCO
JUAA	Japan University Accreditation Association
MDG	Millennium Development Goals
MEXT	Ministry of Education, Culture, Sports, Science and Technology

NIAD-QE	National Institution for Academic Degrees and Quality Enhancement of Higher Education
NQF	National Qualifications Framework
OECD	Organization for Economic Co-operation and Development
SDGs	Sustainable Development Goals
THE	Times Higher Education
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNLD	United Nations Literacy Decade
UNWTO	United Nations World Tourism Organization
VET	Vocational education and training

CERTIFICATION PAGE

I, <u>Malini Nair</u> (Student ID: 51216610), hereby declare that the overall research contents of this Master's Thesis as partial requirement for the Degree in Masters in International Cooperation and Policy, has not been published elsewhere or submitted in any other higher education institutions for the award of diploma or degree. This copy is the original and true copy. All the information used from other sources whether published or unpublished documents and sources have been cited appropriately within the content and authors acknowledged in the references.

ACKNOWLEDGEMENT

First of all I would like to thank the Lord for giving me everlasting strength, wisdom and knowledge to guide me towards the path of uprightness and virtue.

My sincere thanks and deepest gratitude goes towards my supervisor, Prof LI Yan, who has not only assisted me throughout my program and research with her wise knowledge and moral support but most importantly has been a great role model. I would also like to thank the amazing academic staff of Ritsumeikan Asia Pacific University especially Ms. Emiliya Koleva and all the Professors who has taught me and shared their kind knowledge, wisdom and expertise during my studies.

I would like to express my deepest gratitude to Japan International Cooperation Agency (JICA) and Government of Japan, for providing me with the opportunity to study in Japan and their supporting agency Asia Seeds for their tremendous support and contribution by making our stay in Japan comfortable and memorable. Special thanks to MEXT and NIAD-QE for their wonderful support in information sharing and internship program.

Most importantly, this research would not have been successful without the continuing endurance, moral support and understanding that my husband, PRASAD Ravindra, provided me within this 2 and half years.

My special acknowledgement goes to my parents whose souls are with the Lord today. I lost my mother during the process of doing my Masters. Without their hard work, determination and support, I would not have been where I am today. I could not give them back enough but I hope with this knowledge I am able to help the future citizens and make a difference in their lives. This Degree is dedicated to my husband and my late parents.

ABSTRACT

The continuous development of Education for Sustainable Development (ESD) and the paradigm shift of higher education continue to shape the diversity of the institutions, programs and learners. To comprehend and equip learners with emotional and interpersonal skills for the 21st century and beyond, challenges remains dynamic. While the need for higher education institutions (HEIs) to take roles in transformation and empowerment continues to exist, the global public also desires for quality education and wider participation of the society. In order to personally and emotionally transform learners to fit in the society, the necessary competencies need to be taught and acquired. The literature review proved that there still lacks an evaluative framework that is comprehensive and all-inclusive of sustainability competencies to measure quality and relevance of education. Therefore, this study tries to find a comprehensive and all-inclusive evaluative framework by answering the main research question; How to evaluate the key competencies of sustainability in the existing curriculum? Thus this study uses descriptive and interpretative theoretical context based on UNESCO ESD to design the conceptual evaluation framework for sustainability competencies (EFSC). It uses a qualitative approach for data collection and further analysis. This conceptual framework demonstrates whether the existing curriculums already meet the quality and relevance of sustainability competencies or not and to which level if it does. To get a comprehensive understanding of the course objectives and learner outcomes, syllabus for each subject was used to test the framework.

The proposed EFSC was tested for its effectiveness using subject syllabus of two areas of studies at 300 level capstones majors, from College of Asia Pacific Studies at Asia Pacific University (APU) as case studies. The two majors are the environment and development (ED) and culture, media and society (CSM). The findings demonstrated that to a certain

level, the existing syllabus partially reflects the key competencies of sustainability. However, the study area of ED showed greater average percentage reflection of competencies of 75% while the area study of CSM had average percentage of 66%. The major finding during designing and implementation was that the ESFC can be used to successfully evaluate the individual syllabus as well as the curriculum of the study area as a whole. The process of using syllabus to test the evaluative framework proved to be effective in this case. It is also noted that the EFSC can serve dual purposes. The first purpose is as used in this research. Secondly, it can form a framework for designing, writing or developing a new curriculum and syllabus.

APU is not subjected to UN or UNESCO initiatives and does not have a formalized ESD curriculum plan. The significance of this study is to show HEIs who are not subjected to ESD initiatives or who are planning to be part of ESD initiatives on how they can use this conceptual evaluative framework to perform gap analysis rather than re-orienting the whole course, curriculum and syllabus to meet the sustainability competencies. This process will encourage improvement for good practices to enhance quality of teaching and relevant learning. The research output also expresses and recommendations to the readers on how the competencies can be unpacked and positioned during curriculum planning and designing or syllabus writing.

The proposed EFSC is designed to evaluate the sustainability competencies of ESD through checking the syllabus, which is the scope of the thesis. How the curriculum is developed and implemented using these competencies into technical or specialized fields are where this research is limited.

This research also notes that the teaching faculties in APU used as case study has not been subjected to Education 2030 or ESD goals and has not been introduced to inclusion of such

competencies into the curriculum. Therefore the research only focuses on existing curriculum evaluation and not the assessment and measuring skills of the learners, thus it purely and only relates to what and how these competencies should be reflected into the curriculum. The biggest challenge still remains, and that is, how to measure the learning outcomes of these competencies. That is, whether learners have acquired the necessary competencies after education needs further elaboration.

Keywords; sustainability competencies, curriculum, syllabus, higher education, quality and relevance, ESD

1 INTRODUCTION

Education for sustainable development (ESD) is a development process of building individual's interpersonal skills and emotional capabilities for sustainable development through education. These include knowledge, abilities, values and skills of environment, social, culture and economic well-being that are necessary for work and peaceful productive life. To empower individuals, society and to accept responsibility for sustainability through education, it is significant that the education ought to be relevant and of quality.

In a modern world, resources, technology and requirements are constantly changing giving rise to new challenges that require individuals and societies to familiarize new understandings and accustom new way of doing things (Stabback, 2016). Education need to be relevant in terms that the knowledge transferred should meet the current social needs suitable for community development and the national needs in order to attain sustainability whilst moving on towards global aspects and practices. Transversal skills allow learners to be transformed into the society or life with the necessary general competencies as it develops their emotional and social qualities that will empower them as individuals. The ESD learning outcomes in this concept focuses on foundational, specialized and most importantly transversal skills for learners to acquire for decent life and work (UNESCO, 2014).

Over the decades HEIs are seen to have undergone significant transformation centered on the institutions itself, the programs and learners (UNESCO, 2015). The programs in HEIs ought to be inclusive of know-hows with wider participation of stakeholders and integrated use of technologies in order to produce quality graduates (UNESCO, 2017). The obligation for higher education sectors moving towards internalization and globalization remains as

one of the momentous phases of the 21st century. While the need for transformation, empowerment and shaping of HEIs continues to exist, the global public also desires for quality education and wider participation of governance, society, policy makers and academia.

While education and its knowledge are considered as major features to enhance sustainable development learning and its contribution towards economic growths, it is the essence of curriculum design that plays a vital role to effectively realize education 2030 of SDGs (United Nations, 2017). The description of the curriculum should itself justify the objective of the course. Most importantly the needs of the real world value and aspects of the society need to be included that is informative enough, clearly outline, designed and its mode of delivery (Nulty, 2012). All-inclusive international and transnational trends together with local requirements are also considered to be critical during the progression of curriculum development (Stabback, 2016). All-inclusive skills development allows learners to be innovative and creative, be able to adapt to changes, enhance their ability to critically think and solve issues self-reliantly and collaborate or communicate efficiently to secure the future of the community whilst contributing towards sustainable and peaceful society (UNESCO, 2014).

Previous studies as highlighted in section 2.3 showed that HEIs still lacks proper implementation of ESD and the challenges are evident. Students understanding on sustainability and sustainable development still remains at moderate level, thus the concepts of ESD needs to be highlighted in HEIs. In order to personally and emotionally transform learners to fit in the society, the necessary competencies need to be taught and acquired. The societies and educational systems need to dovetail their sustainability efforts. In order for this to be achieved, HEIs needs to include the key competencies of

sustainability by way of revising their curriculum for quality and revisiting their educational goals for its relevancy.

This research focuses on the UNESCO Asia Pacific Strategy; quality and relevance of education with its outcomes that defines reforming the education systems for learners to acquire the necessary knowledge, skills, values that are relevant for work and life (UNESCO, 2014). The learners need to advance with these key competencies of sustainability since it cannot be taught but rather acquired on the basis of action and reflection (UNESCO, 2017). In order to unpack this at university or HEI level, the objective of this study further focused on the quality and relevance of existing curriculum that has not been subjected to ESD or other global initiatives of UN or UNESCO in order to help them to meet sustainability competencies. Therefore, the main research question is: **How to evaluate the key competencies of sustainability in the existing curriculum?** This will provide a view whether the existing curriculums already meet the quality and relevance of ESD or not and to which level if it does. To know the quality and relevance of the existing curriculum a conceptual framework was designed which had to be all inclusive of the sustainability competencies.

There are many methods as shown in the chapter 2 of literature review that can be used to evaluate the curriculum competencies. However, these methods are not all inclusive of such general competencies compared to the key competencies of sustainability published by UNESCO (UNESCO, 2017). UNESCO's learning objective lays general guidance which is not definitive or exhaustive but considered as the key competencies of sustainability that would allow learners to acquire various abilities. These competencies include critical thinking, collaboration, integrated approach by way of problem solving, systems thinking, strategies, normative, self-awareness and anticipatory approach

knowledge and attitudes that are required to actively contribute towards sustainable society (UNESCO, 2017).

Hence, this study designs and introduces a conceptual evaluative framework for sustainability competencies (EFSC). This EFSC framework was applied to show how HEIs can use this framework to evaluate the existing curriculum and syllabus to ensure the relevance and quality of curriculum. To answer the main research question, the EFSC is then tested for its efficiency by using the case study of Asia Pacific University (APU) to see how well these competency outcomes are already reflected in the existing curriculum. To test the effectiveness of the proposed EFSC, the syllabus of 300 level subjects of College of Asia Pacific Studies from the two study areas, Environment and Development (ED) and Culture, Society and Media (CSM), were analyzed. The objectives of this study include:

(1) To find out and propose a framework for evaluation which is comprehensive and all-inclusive of sustainability competencies and would ensure general quality and relevance of curriculum
(2) Test the effectiveness of the evaluative framework for sustainability competencies using case study

Significance of the study

With the focus of the above research outcome, the educational systems and programs at HEIs can be evaluated using the proposed EFSC which will establish a methodology competent to national curriculum development relevant to ESD indicators of UNESCO.

The significance of this study is to show HEIs who are not subjected to ESD initiatives or who are planning to be part of ESD initiatives on how they can use this conceptual

evaluative framework to perform gap analysis rather than re-orienting the whole course, curriculum and syllabus. The EFSC outlines each competency outcomes and standard keywords as a criterion to evaluate the existing curriculum thus performing gap analysis. The gap analysis using this framework will confirm the actual existing essence of the competencies in the curriculum thus gives recommendation for improvement. The EFSC can propose the missing competencies for efficient performance of the curriculum and syllabus by reflecting the significant competencies.

This process will encourage improvement for good practices to enhance quality of teaching and relevant learning. The research output also expresses to the readers on how the competencies can be unpacked and positioned during curriculum planning and designing or syllabus writing. The educational outcome of EFSC can be the learning model for the developed and developing countries that can establish the framework for cooperation among stakeholders and further enhance the assessment of student learning outcomes reflecting sustainability competencies. The proposed EFSC additionally outlines how the competencies shall be reflected into the curriculum that would further develop learner competencies. This framework can be applied for both specialized (technical/disciplined) and non-specialized (non-technical) courses to quantify the reflection of the general abilities in the curriculum.

2 LITERATURE REVIEW

This chapter provides an overview and transition of ESD and its importance in higher education. Additionally in the next sub section, importance of curriculum development and assurance of learning in higher education is discussed. In particularly Japanese evaluation of HEIs at national level is discussed. The chapter concludes with assessments in HEIs using ESD frameworks and models. The major finding evident in this chapter was that there still lacks an evaluative framework to measure quality and relevance of curriculum which is all inclusive of sustainability competencies.

2.1   Education for Sustainable Development in Higher Education

ESD is all inclusive guiding principles of sustainable development with key features necessary to shape individuals and societies for sustainable future. ESD every so often also referred to as Sustainability Education (UNESCO, 2014), allows every individual and learners to attain the necessary skills, knowledge, values and attitudes that will empower their emotional intelligence and personally transform their attitudes to be responsible citizens.

One of the rationales behind the ESD existence remained that the developed and developing countries lacked appropriate and quality education system where many individuals and society remained left out of sustainability education. This included understanding peace, culture and their contribution towards sustainability development issues locally and globally among many other issues. The ESD concept together with other global initiatives advanced into a new framework, Decade of Education for Sustainable Development (DESD). The DESD was implemented by the United Nations (UN) for a period of nine years (2005-2014), integrates principles of sustainable development characteristics, practices and features to enhance quality and relevance of education and

learning (UNESCO, 2005a). However, the history of ESD and reorientation of curriculum strongly linked to the UN Conference on Environment and Development (UNCED) in 1992 where the framework for action as per Agenda 21 – chapter 36 ((UN, 1992): paragraph 36) stated that; *"recognizing education, training and public awareness were critical tools for the transition to sustainable development",* which than influenced the inclusion and shift of the curriculum needs in the education system (UNESCO, 2014).

Consistently, ESD incorporated the process of pedagogical learning, functions of educational centers or institutions and knowledge validation throughout education at all levels (UNESCO Education Sector, 2005). In order to further promote the framework of sustainable education, numerous other global initiatives such as Education for All (EFA), United Nations Literacy Decade (UNLD) and Millennium Development Goals (MDGs) were linked collectively in DESD [UNESCO, 2014]. MDGs initiative was directly linked to one of the DESD objectives that aimed to advance its efforts through ESD. DESD continued to focus on quality of education with extra emphasis on learning, literacy and non-formal learning associating EFA and UNLD initiatives [UNESCO, 2007]. Thus, ESD values and principles focus on the purpose of education, its content and learning with a broader segment of sustainable development. The figure below shows the transition of ESD over the decades and its continuous association to the current UN and UNESCO strategies.

1992 AGENDA 21 (UN)	• Agenda 21 - Promoting Education, Public Awareness and Training
2000 MDGs & EFA (UN & UNESCO)	• UN - Millenium Development Goals (MDGs) - 8 Goals of which 2 are related directly to education. • UNESCO - Education for All (EFA)
2002 DESD (UN & UNESCO)	• UN - Decade of Education for Sustainable Development (DESD) - 2005 - 2014 (to promote ESD and to integrate sustainable development more actively into education & beyond) • UNESCO - supported & contributed in the implementation of DESD
2014 UNESCO Strategy 2014-2021	• Quality and relevance of education • Outcome - Education systems reformed for learners to acquire the knowledge, values and skills for decent life and work
2014 GAP (UNESCO)	• Global Action Programme on ESD (GAP) (Follow up on DESD and post DESD contribution)
2015 Rethinking Education (UNESCO)	• The growing gap between education and employment • Recognizing and validating learning in a mobile world • Rethinking citizenship education in a diverse and interconnected world • Global governance of education and national policy-making
2015/2016 SDGs (UN & UNESCO)	• UN - Sustainable Development Goals (SDGs) 2030 - 17 Goals of which 5 goals specifically involves education while the other goals are linked to Education 2030 indirectly. • UNESCO - leads & coordinates the SDGs 2030 initiative
2017 ESD Goals; Learning Objectives (UNESCO)	• Document on ESD Goals: Learning Objectives. ESD - a key instrument to achieve the SDGs

Figure 1 shows the history of Education for Sustainable Development and its progression to the current UN & UNESCO frameworks (Source: Author)

The objective outlook of ESD is to make the educational goals and curriculum right, of quality and effective to meet the requirements and challenges of the 21st century. DESD aimed to nurture and improve quality of teaching and learning, provide opportunities to countries to integrate ESD into education reforms and enable interaction, networks and exchange among stakeholders in ESD [UNESCO, 2007]. Henceforth, DESD focuses on four thrusts of ESD such as improvement of basic education and its quality, reorienting existing education, providing training and increasing public awareness and understanding (UNESCO, 2012a.).

To empower individuals, society and to accept responsibility through sustainability education, it is significant that the education ought to be relevant and of quality. Education to be relevant in terms that the knowledge transferred meets the current social needs suitable for community development and or meeting the national needs in order to attain sustainability whilst moving on global aspects and practices. To enrich the statement for opportunities and challenges of sustainable development, UNESCO proposed for all stakeholders to review their programs and curricula of schools and universities (UNESCO, 2005b). A change in education perception obligates to reorient towards ESD. This is for individuals to engage in issues related to sustainability and to foster the development of sustainability competencies (Rieckmann, 2010). Global Action Programme (GAP), came into place to continue the initiative of ESD and integration of sustainable development post DESD. The intention of GAP was to provide a follow up of DESD such as its success, challenges and unfinished business and to contribute further post 2015 [UNESCO, 2014]. While GAP aimed to further advance in education and learning, it continued to focus on strengthening, re-orienting education and learning to promote sustainable development. UNESCO regional office developed further four strategies and its outcomes based on the need for the Asia and the Pacific. These four strategies includes; "*policies and planning for lifelong learning, equality and equity in education, teaching and learning and quality and relevance of education*" [UNESCO, 2014]. This research focuses on quality and relevance of education with its outcomes that defines reforming the education systems for learners to acquire the necessary knowledge, skills, values that are relevant for work and life.

Owing to internalization and globalization, many learners tend to attain higher education in other countries either regionally or internationally, thus giving rise to cross border education. The learner mobility also stresses on comprehensive disciplines which may not be offered in their country or either lacks quality and recognition. The higher education

sector continues to play significant role in transforming societies as these institutions have largest, brightest and best educated young people (Lozano, Lozano, Mulder, Huisingh, & Waas, 2013). Given the diversity of governing, one of the biggest challenges of cross-border education has been balancing quality and accessibility (Knight, 2008). ESD positions itself as an inclusive and covers challenges requiring contributions from many disciplines in the education sector. To support this the members at the UN Conference on Sustainable Development held in 2012, agreed for the HEIs to teach concepts of sustainable development to develop skills essential for graduates in the job market which intend requires the necessary change in curriculum (UNESCO, 2012a.). In order to fulfill this gap, UNESCO introduced another global initiative on "rethinking education" as a global common good. It addresses the challenges faced by policy makers due to learner mobility, graduates across borders and patterns of brain drain [UNESCO, Rethinking Education. Towards a global common good?, 2015]. Rethinking education is centered on making policies for education in the complex world and highlights in recognizing the growing gaps between employment and education, validation of learning and diversity. The graduates who return back to their country for employment had better attain certain level of knowledge and competencies that requires suitable development of the countries sustainability goals. In a recent study and international survey conducted by president of TalenSmart asked business leaders about "*what makes some employees more successful than others*"[1], found out that 78% responded towards personality while 53% said cultural fit and employee skill that ranked only 39% (Bradbery, 2017). However, he argued that the personality referred by leaders is actually emotional skills that can change and improve overtime. Transversal skills allow learners to be transformed into the society or life with the necessary general competencies as it develops their emotional and social qualities that

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[1] https://www.weforum.org/agenda/2017/08/why-personality-and-not-skill-makes-you-a-great-employee

will empower them as individuals. The ESD learning outcomes in this concept focuses on foundational, specialized and most importantly transversal skills for learners to acquire for decent life and work (UNESCO, 2014).

The idea of developing and continuously enhancing the ESD needs the fundamental human development through quality education in formal teaching. A study conducted in England higher education system, states that higher education or universities are seen to have a key role towards addressing the sustainable development issues (Scott & Gough, 2007). The study further relates that the changes depend on how the HEIs vision and mission portrays its role and allocate resources and more importantly what and how it teaches and accomplishes the teaching (Scott & Gough, 2007). One of the major outputs of any HEIs are its quality graduates who are believed to have acquired the necessary competencies and abilities to enter the job market and or peacefully fit in society as entrepreneurs. Therefore, HEIs continues to play a significant role towards shaping the future of learners by generating knowledge that can contribute towards raising awareness and developing sustainability competencies that are appropriate towards addressing sustainable development (Rieckmann, 2010).

The ESD advanced its purpose in line with Sustainable Development Goals (SDGs) which was adopted in 2015 (United Nations, 2015), *"Goal 4; Quality Education was defined as "ensure inclusive and quality education for all and promote lifelong learning"* contains ten different targets, one of which is investing knowledge and skills in individuals and the society through education to undertake responsibility for a better sustainable world (United Nations, 2017). The United Nations 2017 resolution while reaffirming the SDGs emphasized the indicators. Particularly, SDG 4 also known as education 2030 outlines the five pillars extending to policies at national level, curriculum, education for teachers and evaluation of learners to promote ESD and education in global citizenship (United

Nations, 2017). Nonetheless, this research focuses on the relevance and quality of curriculum. ESD signifies the key competencies of sustainability that are cross-cutting to all SDGs and all walks of life. The provision of ESD is to develop learning outcomes that are specific to achieve and link to other SDGs (UNESCO, 2017).

Whilst focusing on learning outcomes, the ESD provides general competencies to enhance human resources development and graduates that meet the requirements to challenge sustainable development for now and the future. However, the guidelines is not in any way prerequisite but provides ideas for learning objectives and expected learning outcomes that the faculties or colleges can select based on their learning context (UNESCO, 2017). In other words the UNESCO documents do not necessarily suggest that all key competencies shall be indicated in one learning context. It can rather be done through progressive learning throughout the program which will allow learners to gain the necessary competencies. Hence, UNESCO's learning objective lays general guidance which is not definitive or exhaustive but considered as the key competencies of sustainability that would allow learners to acquire various abilities. These competencies include critical thinking, collaboration, integrated approach by way of problem solving, systems thinking, strategies, normative, self-awareness and anticipatory approach knowledge and attitudes that are required to actively contribute towards sustainable society (UNESCO, 2017). The 2017 UNESCO report also noted that certain content and competencies in the current programs may already be covered; therefore the key competencies of sustainability can continue to act as a reference and resource to reinforce existing programs or during the scheduled periodic review of curriculums (ibid). Thus, this research focuses on how HEIs can use this framework of key competencies of sustainability in evaluating the existing programs and syllabus to ensure the relevance and quality of curriculum. To answer this question, a conceptual framework for evaluating key competencies of sustainability is

designed in chapter 4. The framework outlines each competency outcomes and standard keywords as a criterion to evaluate the existing curriculum thus performing gap analysis. The gap analysis using this framework will confirm the actual existing essence of the competencies in the curriculum. The framework further proposes the missing competencies for efficient performance of the curriculum by reflecting the significant competencies.

The proposed evaluative framework further outlines how the competencies shall be reflected into the curriculum that would develop learner competencies. The learners need to advance with these key competencies of sustainability since it cannot be taught but rather acquired on the basis of action and reflection (UNESCO, 2017). Therefore, the expected learning outcomes and assessment methodology described in a curriculum plays a significant role in acquiring the quality and relevancy of educational outcomes in HEIs.

2.2   Assurance of Learning (AOL)

While it is prominent that the use of curriculum may vary between countries, HEIs and learners in most countries may consider referring to curriculum design and outputs in deciding their educational pathways. There may be several individuals who do not really consider referring to curriculum design but rather assumes its output by the program name or choice of teachers, opinions of other senior students and or the subject or program is made compulsory. Some HEIs lack emphasis on the significance of curriculum, its output and its usage for example some questions raised during this research were; who refers to a curriculum, curriculum does not really gives the clear picture of what will be taught in class, curriculum tends to be revised just before class so why would a formal written curriculum really matter. All importance has been given widely at institutional, national and international levels by gauging and determining the best practices and policies, however, during the evaluation cycle, the curriculum, its objective and the effectiveness of

learner outcomes are usually overlooked and given less importance when it comes to evaluating the quality of education (Stabback, 2016). A number of authors in an article concluded that for institutional advancement, academic designing, revision of programs and learning evaluation is necessary as this would support shaping the mission and profile of the overall academic programs and support learners to acquire the key competencies (Wiek, Withycombe, & Redman, 2011). The other aspects of the ESD includes national policy review and reorientation of higher education teaching and research, incorporating education within the national strategies for sustainable development, promoting education investment and sharing best quality practices (Scott & Gough, 2006).

The review further looks into how Japan education system deals with assurance of learning. Japan has standardized assessments and evaluations as per the designed curricula and industry requirements for specialized/disciplined and technical courses. Most HEIs disciplines have adopted Assessment of Higher Education Learning Outcomes (AHELO) which is an initiative of Organization for Economic Co-operation and Development (OECD). It has four dimensions and comprises of discipline specific and generic skills, organizational characteristics and added value similarly to USA that uses Collegiate Learning Assessment (CLA) to assess the overall learning outcomes of the universities or HEIs (Yamada, 2014). The quality assurance organization and agencies that conduct evaluation and accreditation of universities, colleges of technology and graduate law schools are certified by Ministry of Education, Culture, Sports, Science and Technology (MEXT). NIAD-QE covers universities and colleges of technology while Japan University Accreditation Association (JUAA) targets universities and junior colleges. Japan Institution for Higher Education Evaluation (JIHEE) and Japan Association for College Accreditation (JACA) both cover junior colleges only. There are other agencies including the four agencies above that also conduct evaluation and accreditation for professional

graduate schools. However, this study considered discussing two of the organizations that evaluates and accredits universities that are NIAD-QE and JUAA. JUAA is one of the oldest evaluation and accreditation organization since its inception in 1947 under the American army. However, the name JUAA and its certification by the MEXT came into existence and enforcement in 2004 a year before NIAD-QE was formed. JUAA conducts evaluation and accreditation as per the guidelines of MEXT for HEIs. The universities, technical college and junior colleges undergo evaluation in every 7 years compared to professional graduate schools which undergoes evaluation in every 5 years (JUAA, 2016).

The national HEIs are part of the national university cooperation and MEXT provides two third of the funding to these HEIs, however legally they operate independently. NIAD-QE is still tasked to evaluate the teaching and evaluation of these HEIs using their own general principles and standards for evaluation and accreditation of universities. APU used as a case study for this research is one of the private universities from the 604 listed private universities in Japan (as shown in t*able 2).* Since most of the private universities are evaluated by JUAA, APU was also evaluated by JUAA following the national framework. The JUAA report further highlights that as per the fiscal year 2015 university accreditation results; JUAA has granted accreditation to Ritsumeikan Asia Pacific University for satisfying the JUAA university standards (JUAA, 2016). Nevertheless both JUAA and NIAD-QE follows the principle requirements of the MEXT thus aligning their evaluation standards accordingly.

Each school system has its own guidelines for curriculum design for higher education and standards for evaluation of student learning outcomes (MEXT, 2009). The report further outlines the classification of standards in establishing undergraduate courses and or universities which has four categories pertaining to the following;

quote; "(a) "regulations on the basic framework of admission requirement, course term, university system", (b) "regulations stipulating the minimum standard of human and material resources such as faculty and facility", (c) "regulations stipulating the norm on educational activities in university", and (d) "regulations on taking courses and requirement for graduation"," **unquote -** (MEXT, 2009)

The Japanese Higher Education system does not have national qualifications framework (NQF) but Japanese school system to confer programs as national qualifications. The HEIs have the privilege and freedom to design their own programs and curriculums. According to the evaluation guidelines for teaching, MEXT provides reference guidelines on graduate competencies as a requirement for institutional guidance. The reference guidelines covers the key domains such as knowledge, skills, attitude and learning outcomes description for undergraduates programs for institutional guidance to NIAD-QE (NIAD-QE, 2017). There are ten standards that NIAD-QE considers that university should satisfy. This includes general conditions, research and other activities as well as educational activities in regular programs including bachelors program (NIAD-UE, 2014). It is also noted that in Japan, measurement of general or common skills or abilities is not quite an easy task though it is excelling to overcome complexities, related to US education system that effortlessly expedites these general and common skills and abilities into the structure of undergraduate regardless of specialized (technical) or non-specialized (non-technical) programs, pg.144 (Yamada, 2014).

Conferring to the undergraduate degree programs description report, each graduate competency for each field of specialization provides the reference guidelines relating to the outcomes that are common across the undergraduate programs. These common outcomes include knowledge and understanding, generic skills, attitude, intentionality and comprehensive learning experience and creative thinking (MEXT, 2008). Under the

certified evaluation and accreditation (CEA), it is the JUAA and NIAD-QE that verifies whether the universities have well established policies including policies for designing and implementing curriculum, admission and degree awarding policies based on the reference guidelines provided by MEXT. This is a mandatory review scheme under the School Education Act. By way of these policies, it also confirms based on universities mission, policies on education and research, human resources development that the appropriate learning outcomes of the universities are achieved (NIAD-UE, 2014). This process ensures the quality of universities procedures and quality of academics programs as well. *Figure 2* below shows an illustration of Japanese quality assurance framework for universities and the three systematic processes that work as a legal framework for quality enhancement and further improvements of universities academic activities (MEXT, 2009).

Henceforth, the design and development of curriculum of any HEIs primarily takes into account the national or country's necessity to respond to challenges followed by regional and the global views. The design also takes into consideration of the national, country specific education systems such as national qualifications frameworks (NQF) and quality assurance requirements as per the corresponding Education Act or legislation of the country. While developing a curriculum one needs to consider many aspects regarding its purpose, relevancy, equitability, inclusiveness, whether its learner centered or no, flexible and most importantly whether it is consistent across all the stages and division of program areas. With the greater emphasis on national needs, the curriculum encompasses the educational purposes that remain recognized by the society while consequently during curriculum development a wider stakeholders, public consultation and discussions are required. The UNESCO report on "What makes the Quality Curriculum", stated the intricacy for the development of curriculum based on *"what"* and "*how*" of any teaching and assessment that endures challenges for curriculum developers, practitioners and policy

makers (Stabback, 2016). The report further indicated the curriculum represents a systematic and cognizant mixture of skills, knowledge and values, teaching methodology, process of learning and assessment that comprehends what, why, when and how the learners should learn the concepts (Stabback, 2016) .

The quality of curriculum determines and gives a fair idea of how successful teaching and learning of the particular course would substantiate. An effective and transparent curriculum has clear learning goals, activities and assessment of the expected learning outcomes. While learning objective is a broader concept and something that the facilitator wants to achieve, the expected learning outcomes directly relates to what the learners should achieve that are student focused, behavioral and specific statements (Nulty, 2012). The curriculum is gradually seen as major distinctive document towards achievement of quality learning outcomes and success to education reforms. A program of study or curriculum also serves as a fundamental concern affiliated between university, teaching staff and most importantly the students. The experience of viewing the curriculum largely varies between the different stakeholders and remains complex. Therefore, a clearly defined and useful instrument within the curriculum motivates stakeholders to challenge the issues of education and all-inclusive curriculum outlooks based on different dimensions of learning (Totté, Huyghe, & Alexandra, 2013).

Unless it is compulsory course, learners in most circumstances tend to choose optional courses instinctively based on the curriculum design, delivery and assessment. The policy makers or curriculum developers undertakes that any curriculum largely depends and shall articulate holistic development with an establishment of quality learning and ensuring its equitability with the well demonstrated competencies (Stabback, 2016). While education and its knowledge are considered as major features to enhance sustainable development learning and its contribution towards economic growths, it is the essence of curriculum

design that plays a vital role to effectively realize education 2030 of SDGs (United Nations, 2017). The description of the course should itself justify the objective of the course and its most important value and aspects to the society that is informative enough to clearly outline the design and its delivery based on its need in the real world (Nulty, 2012). All-inclusive international and transnational trends together with local requirements are also considered to be critical during the progression of curriculum development (Stabback, 2016). All-inclusive skills development allows learners to be innovative and creative, be able to adapt to changes, enhance their ability to critically think and solve issues self-reliantly and collaborate or communicate efficiently to secure the future of the community whilst contributing towards sustainable and peaceful society (UNESCO, 2014).

2.3   Previous Studies on ESD and Evaluation in Higher Education

Frequently, new innovations and new demands arises that requires graduate to utilize the general, emotional and personal skills to be more productive and provide efficient and effective solutions to problems bearing in mind the social, environment and economic factors and its influences. In a modern world, uncertainty is obvious, resources, technology and requirements are constantly changing giving rise to new challenges that require individuals and societies to familiarize new understandings and accustom new way of doing things (Stabback, 2016).

Fundamentally, ESD remains as a continuous reactive learning process that develops the society and the environment using inter-generational dimension of collaborative and philosophical ideas of learning. With an effective learning process it produces concrete outcomes reflecting the skills, knowledge, understanding and action that will strengthen, motivate and promote further learning (Foster, 2008). ESD equips learners not only with knowledge but competencies that are required to engage them in taking the essential

transformation thus producing socio-emotional, cognitive and behavioral learning outcomes (UNESCO, 2017).

For decades, sustainable development and ESD conception has been the discussion and a place of interest among academia and policy makers in higher education to bring improvements in education quality. Leaners knowledge and understanding towards sustainable development is still lacking in higher education. Studies taken earlier to investigate student's awareness and opinions of sustainable development, stood at a moderate level (Yuan & Zuo, 2012). A study conducted by (Turner, 2008), recognized that university students were fairly aware of the definition of sustainable development and seventy five percent gave priority to sustainable development projects. The view of sustainable development ranged globally over the last couple of decades or so and to create sustainability solutions for the future, the higher education sector remains recognized for the support of the global sustainability (Scott & Gough, 2007). The practical application of sustainability into formal necessities needs to procure transformation of behaviors, attitudes and new knowledge, thus the HEIs are seen as a major stakeholders towards the direction of achieving sustainable futures (Klavins & Pelnena, 2010). The higher education have and continues to play significant role in transforming societies as these institutions have largest, brightest and best educated young people (Lozano, Lozano, Mulder, Huisingh, & Waas, 2013). Scott and Gough also supports this concepts in their studies where they argue that social learning process pertaining to sustainable development brings in useful outcomes in relation to skills, knowledge and understanding that strengthens the motivation and competence for further learning (Scott & Gough, 2010). The authors further stated that in education, ESD prepares informed aspects of lifelong learning with intents of social engagement that can be accomplished individually, in community and workplaces. A number of European HEIs from Lebanon, Jordon and Egypt have developed

ESD expertise to form a consortium which aims to address sustainability by revising the university curriculum. This requires HEIs to revisit their missions in order to streamline their existing courses, campus operations, research priorities and community outreach (Kanbar, 2012). MEXT, in Japan has formed a similar ESD consortium to promote regional and international cooperation, exchange among schools to strengthen ties with non-formal education facilities and non UNESCO associated schools (MEXT, 2017).

The following paragraph provides evidences of previous research that used similar ESD frameworks and sustainability competencies to evaluate the university goals, educational programs and existing courses or curriculums. These reviews were based in HEIs or in university setting in different countries such as Belgium, Arab and Spain while in one article the authors used literature review to see how far ESD in higher education has advanced based on critical reflection and understandings using. Through the analysis it showed that the HEIs using the context of ESD can systematically argue by use of elements such as nurturing transdisciplinary, cooperating with other universities, creating on campus environment for promotion of sustainable development and providing sustainable development life experiences, making sustainable development part of the HEI framework and educating the educators (Lozano, Lozano, Mulder, Huisingh, & Waas, 2013). Higher education sustainable development commitment should be enacted as public value otherwise the commitment may remain doubtful as stated by the authors in above research and suggested that whether its education, community outreach or research, HEIs can be the provider of the virtuous ideas.

An evaluation of sustainability competencies for three programs was conducted to find out to what extent the listed competencies were reflected into the existing program in the Belgium universities. The study used analysis framework based on literature review in order to find the common and most comprehensive competence and further divided into

sub-competence describing the expected learner outcome in detail (Lambrechts et. al, 2012). This research methodology uses similar design except for the competencies in this methodology are directly obtained from UNESCO-ESD (UNESCO, Education for Sustainable Development Goals Learning Objectives, 2017) framework and further designed as conceptual framework with each competency outcomes and standard keywords. In case of Belgium, the five competencies for sustainable development identified by evaluators for two Belgium universities case studies were responsibility, emotional intelligence, system orientation, future orientation and personal involvement and involved analysis of both general key competencies and disciplinary competencies (Lambrechts, Mula, Ceulemans, Molderez, & Gaeremynck, 2012). It is noted that these two universities have sustainability certification (2 stars) from Auditing Instrument for Sustainability in Higher Education (AISHE), meaning they have already been recognized for their efforts for inclusion of sustainable development in the universities and has adopted ESD policies. The studies found out that competence responsibility and emotional are widely reflected and emphasized in all education programs compared to future orientation and personal commitment which were almost absent while action oriented were also under represented (Lambrechts et.al, 2012). Overall it showed that the competences of sustainability were either reflected in a fragmented way or implicitly and major focuses for educational programs were given on general competencies which included emotional and intelligence. However, the list of competencies in this framework was not really comprehensive and exhaustive to measure the competence in the programs and the approach does not seem to be sufficient to systematically reorient the program to transform leaners for personal and professional abilities to realize sustainability.

In an effort to achieve sustainability education and inclusion of ESD, a study result by UNESCO regional bureau for education in the Arab explored similar mechanisms and

recognized the need for higher education system involvement to achieve sustainability (Makrakis, Kostoulas-Makrakis, & Kanbar, 2012). In the case study from Lebanon, the author used a set of five pillars in making assessment for teaching and learning methods currently used in university programs and the student's current attitudes towards ESD competences (Kanbar, 2012). In order to foster sustainable development and provide quality education the following pillars as listed below were outlined for assessment and was suggested to be used in all programs. The first four pillars were adopted from Delor's report (Delors, J., & UNESCO, 1996) and fifth pillar, "*learning to transform oneself and society*" was adopted from UNESCO (UNESCO, Shaping the Future we Want. UN Decade of Education for Sustainable Development (2005-2014), 2014).

*"Recognition of the challenge of sustainability (**learning to know**); acting with determination (**learning to do**); collective responsibility and constructive partnership (**learning to live together**); the indivisibility of human dignity (**learning to be**); individual and collective actions (**learning to transform oneself and society**)"* - (Kanbar, 2012).

The findings revealed that there is a need to reorient the courses in the university to address sustainability issues. Based on the students lack of knowledge and attitudes towards sustainability, it further indicated that the curricula needs to include ESD by way of changing teaching methods and advancement of academic approaches including the curriculum design (Kanbar, 2012). Kanbar findings on teaching and learning methods showed that lecture based teaching ranked the highest compared to interactive engagement and project based learning which scored below average. While lecture is thought to be a supportive source of disseminating information speedily, the author suggests that other teaching methods to facilitate learner's involvement to develop collaborative, analytical and critical thinking skills needs to be done collectively to improve the learning of sustainability competencies. For learners to reflect and take actions in dynamic, complex

and uncertain futures, HEIs need to integrate major activities of sustainability into the curriculum with essence of local and global obligation (Kanbar, 2012).

Previous studies have called for HEIs operation and curriculums to be mainstreamed for integration of sustainable development in a more all-inclusive approach. One of the research noted that Spanish universities lack adequate studies in higher education development towards sustainable development (Jorge, Madueno, Cejas, & Pena, 2014). The studies from Jorge et.al also considered designing an assessment tool to carry out evaluation in all categories of the university system including community outreach, educational programme and curriculum, operations and research therefore also considered analysis of previous literature reviews (Jorge, Madueno, Cejas, & Pena, 2014). The assessment tool included seven dimensions of evaluating the environment, governance, companies, students, society, staff and continuous improvements. A survey also included questionnaires to Spanish universities which included 135 identified sustainability practices out of which 21 practices were focused on students. The responses from senior management and rectors suggested that five practices that were commonly implemented related to registering of student complaints, compliance and data protection, information on curriculum and social activities, disability assistance and students involvement in institution management (Jorge, Madueno, Cejas, & Pena, 2014). A few gave importance to sustainability training and was one of the lowest score. The dimensions and items to measure sustainability education were not comprehensive as only one or two practices listed were related to sustainability only and lacked the significant focus on curriculum sustainability or all-inclusive reflection of sustainability in the curriculum. Jorge et.al concluded the barriers identified through this assessment and recognized that lack of specialization by faculty and staff, lack of financial resources, lack of support and resistance to change (Jorge, Madueno, Cejas, & Pena, 2014).

The following journal article explored mainly conference papers, papers on ESD initiatives and interlinking declarations pertaining to policies and commitments in the HEIs and or universities. The article took into account the overall university system such as campus operations, curricula and competencies, sustainability research and community outreach programs (Lozano, Lozano, Mulder, Huisingh, & Waas, 2013) which are also the guiding principles for universities as per the ESD document (UNESCO, 2014). The baseline study of the article was to present whether the universities are leading the sustainable development initiatives and models to their students or is the approach more society driven and what can be done to ensure that sustainable development can become an integral part of HEIs or universities. Upon student evaluation, one of the frameworks to evaluate the overall university system or the elements that the universities should consider for sustainability were; (1) sustainability commitment and monitoring, (2) community outreach, (3) land use planning and (4) waste and energy evaluation (Lozano, Lozano, Mulder, Huisingh, & Waas, 2013). University in Pulau, Sains, Malaysia and Pinang applied this measurement scale to measure the student perspective on practices pertaining to sustainability and discussed their implications that use of these elements can make universities more sustainable (Nejati & Nejati, 2013). Lozano et.al noted that sustainable development is the golden thread needed for societal transformation in a more effective and productive way whilst recommending HEIs to strongly consider the multi-trans disciplinary teaching, community outreach and research in empowerment for sustainable society (Lozano, Lozano, Mulder, Huisingh, & Waas, 2013).

The approach to teaching and learning that supports the pillars of education is based on the transdisciplinary argument and in terms of ESD, sustainability is considered to be an all-inclusive conception of deeper learning attributed with quality learning (Jones, Trier, & Richards, 2008). Considering the uniqueness of the education under ESD, the most

competitive advantage of ESD providers is the quality of education as it reflects the important features of university's image and gratifying fundamental phenomena of both the international and national levels that incorporates ESD more effectively into the education system (Bedawy, 2014). The characteristics of university research for sustainable development, study, commends that local and global scale, short to medium and long term perspectives together with various dimensions of economy, social and environment aspect should be considered in collaboration with multi and interdisciplinary inclusion of natural science and social aspects (Waas, Verbruggen, & Wright, 2009). The study further divulges that application of precautionary, action oriented and dealing with uncertainties intends to involve practices to pursuit sustainable development in a more collaborative manner in favour of public and private interest indicating the transition and administration of sustainability (Waas, Verbruggen, & Wright, 2009). Though, Le´le´ argued that university research and development should be proactive and problem oriented when it comes to sustainable development or various sustainability issues (Le´le´, 1991).

The prospects of sustainability associated research are emerging as the key component of social progress since sectors are realizing the need, however, the opportunity of inter disciplinary research owing to a variety of factors remains unrealized whether it is internal (institutional and disciplines) or external factors relating to businesses and industries (Scott & Gough, 2010). In order for learners to respond to the new challenges and situations, to find relations between the existing and new knowledge, inter-disciplinary and integrated learning skills are required for a deeper understanding of a concept to strengthen and solve problems skills (Stabback, What Makes a Quality Curriculum; In-Progress Reflection No.2 on Current and Critical Issues in Curriculum and Learning, 2016). Stabback (pg.23), further highlights the importance of inclusion and promotion of integrated learning, that

put forwards, that the curriculum should be of decent quality when it requires multi-disciplinary response to challenges (Stabback, 2016).

To achieve the goals of sustainability in HEIs, it is important that the key stakeholders realize the approaches towards sustainability dimensions (Filho, 2011). These stakeholders should not just reflect the needs of their institutions but also the partner institutions and countries that they receive their learners or students from. In an exploratory study, key stakeholders identified and that contributes toward success of sustainability strategy includes; leaders or management of HEIs, teaching faculty or academic and administrative staff, industries and most importantly the students in the development and promotion of sustainability initiatives (Aleixo, Leal, & Azeiteiro, 2016). The international relation within partner universities and countries remains momentous. The authors additionally noted that getting all the stakeholder engagement and participation is one of the biggest challenges to drive the concept of sustainability education while other challenges acknowledged were lack of financial resources, organizational conventional structure, resistance to change, lack of specialization and training in the field of sustainability. Nonetheless, the findings from the exploratory study confirmed that financial is one of the biggest challenges followed by information and communication that exists as the main limitation and cutting-edge for promoting sustainability in higher education (Aleixo, Leal, & Azeiteiro, 2016).

Therefore, based on the above findings, HEIs still lacks proper implementation of ESD and the challenges are evident. Students understanding on sustainability and sustainable development still remains at moderate level, thus concluding that concepts of ESD needs to be highlighted in HEIs. Having the necessary competencies to carry out daily activities and to contribute to the society, one needs to transform themselves personally and emotionally. In order for this to be achieved, HEIs needs to include these key competencies

of sustainability by way of revising their curriculum or programs and revisiting their

educational goals.

3 JAPANESE HIGHER EDUCATION SYSTEM AND ITS AFFILIATION WITH UNESCO INITIATIVES

This chapter discusses Japanese higher education system and its role in UNESCO affiliated projects including ESD. The chapter concludes with an overview of the case study university and its local and international recognition. Japan has well adopted basic plan in order to promote education and ESD as the government has revised their basic Act on Education. MEXT announced the curriculum and instructional guidelines with ESD philosophy are reflected from kindergartens up to high schools in accordance with the Basic Act on Education but for universities it is more on a voluntary base.

3.1   Japanese Higher Education System

The higher education system in Japan has rather a diagrammatic structure of school systems compared to many other countries that has higher education qualifications framework that allows awards to be mapped onto the framework at different levels. The organization of Japanese school systems includes the entire education system from pre-primary education to higher education as shown in *Figure 1*. There are four types of higher education in Japan that are listed as per *Table 1*; namely universities, graduate schools, junior colleges, college of technology and professional training colleges.

Organization of the School System in Japan
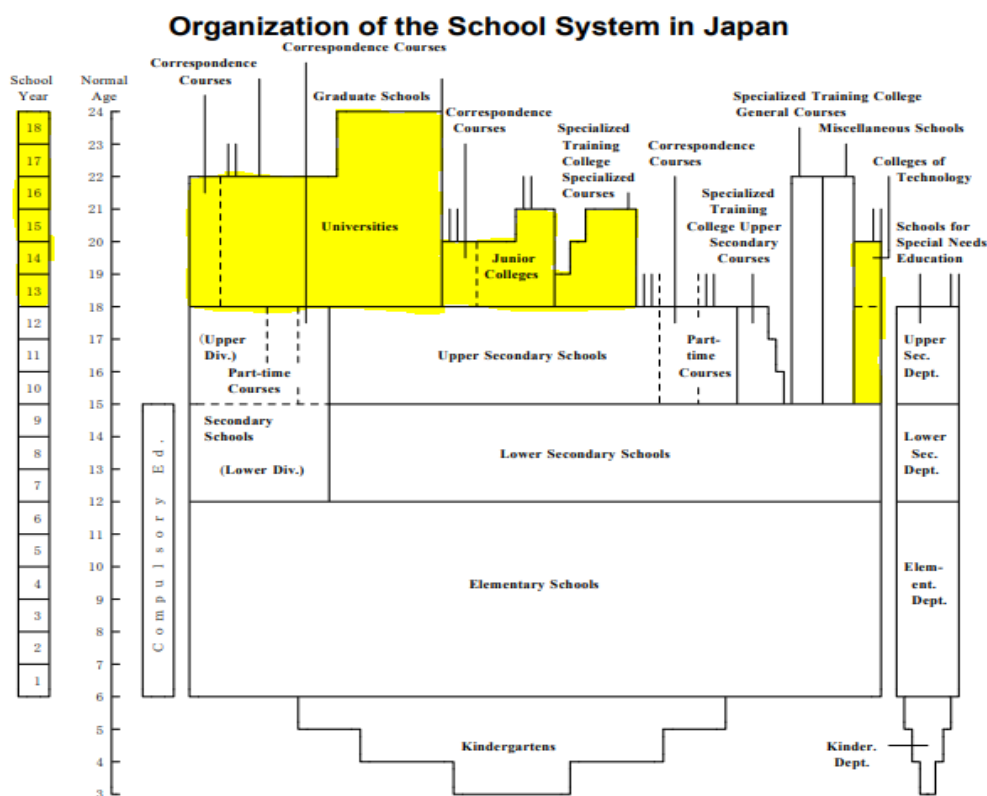
Figure 2 shows the diagram of Japanese school system. The section highlighted in yellow shows the category and types of higher education; Source (*Adopted from); Ministry of Education, Culture, Sports, Science and Technology – Japan* (**Higher Education Bureau, 2012**).

These five types of HEIs are quite different compared to other Asia and Pacific countries. For example Australia (which has only two stream namely higher education and vocational education and training (VET)) and China (which has public, private and vocational and technical college streams).

Table 1 Showing the Categories of Higher Education Institutions in Japan and their Study Programs with Academic Titles

Type	Study Programs and Academic Titles/Awarded Degrees
Universities	Undergraduate programs: Bachelor's Degrees / 4 year programs and 6 year for medicine, dentistry, pharmacy and veterinary medicine)
Graduate Schools	Master's program, Doctoral programs, Professional degree programs
Junior Colleges	Associate Degree / 2-3 year education
Colleges of Technology	Vocational oriented education and or Unified 5 year education/Titles of Associate
Professional Training Colleges	Diploma (2 years of study) or Advanced Diploma (4 years of study) – 1-4 year education

Source (Adopted from): National Institution for Academic Degrees and Quality Enhancement of Higher Education (NIAD-QE), Japan (NIAD-UE, 2014)

While 60% of the students join the five categories of HEIs[2] as shown in Table 1, about 20% of the students join the professional training colleges which are observed by local government or prefectural municipality. Another 20% of the students are expected to have joined the job market after junior high school. The graduate schools and universities are defined within the schemes of the university system. There are 780 universities in Japan of which 77% are private universities. However, the total number of junior colleges, college of technology, professional training colleges and universities stands at 3,991 enrolling approximately 3.66 million students. Excluding the professional training colleges the approximate enrollment number has remained constant since 1996 (NIAD-QE, 2017).

Table 2 Shows the Categories and Number of Higher Education Institutions in Japan with Enrollment Rate as of May 2016

Categories	National	Prefectural/Municipal	Private	Total
Universities	86 (609,428)	90 (152, 894)	604 (2,128,620)	780 (2,890,942)
Junior Colleges	0 (0)	17 (6,670)	320 (1,117,280)	337 (123,950)
College of Technology	51 (51,632)	3 (3,742)	3 (2,227)	57 (57,601)
Professional Training Colleges	9 (309)	186 (25,251)	2,622 (563,490)	2,817 (589,050)

Source (Adopted from): *National Institution for Academic Degrees and Quality Enhancement of Higher Education (NIAD-QE), Japan* (NIAD-QE, 2017)

As of May 2016, NIAD-QE record shows that 77% (604) were privately owned universities with enrolment rate of 2,128,620. Twelve percent (90) are under prefectural or municipal with enrolment rate of 152,894 and 11% (86) were national universities with enrolment rate of 609,428 (NIAD-QE, 2017). This shows that the higher education sector is a privately dominant sector. For national universities, 37% of the revenue is from public financing with 11% generated from student tuition payment, while public universities receives 31% public finance and 15% is from student tuition payments. For private

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[2] HEIs - includes Universities, Graduate Schools, Junior Colleges and College of Technology

universities it receives 9% subsidies while 77% revenue is generated from student tuition payments (MEXT, 2016). According to MEXT data, majority of new students in HEIs is expected to decrease as the full scale population is estimated to decline from 1.19 million (as recorded in 2017) to 0.88 million by 2040 (MEXT, 2017). Therefore this calls for a common access to HEIs, considering international students and matured learners and not only 18 year old population through generation of learning opportunities within the region (MEXT, 2011).
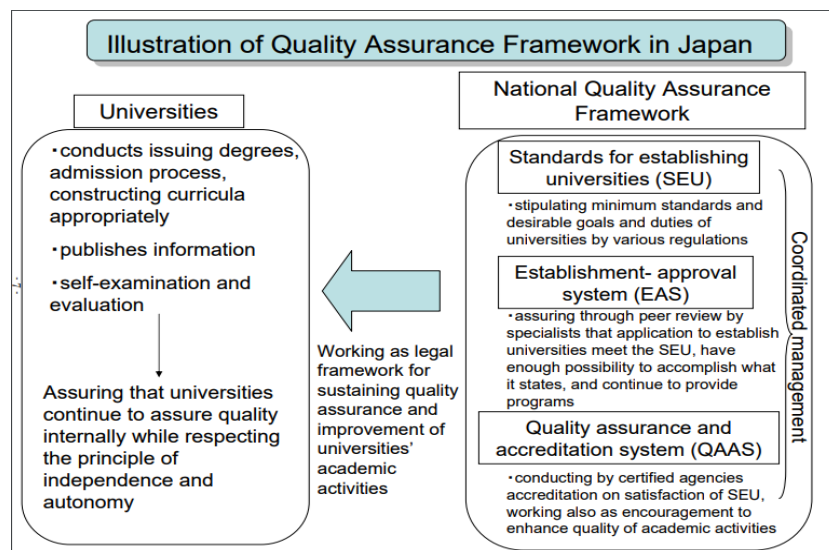
Figure 3 shows the Quality Assurance Framework in Japan which is a legal framework for sustaining quality assurance and improvement of universities.

Source (Adopted from); Ministry of Education, Culture, Sports, Science and Technology – Japan (MEXT, 2009)

Due to the boundless changes in the economy and society, the future concept of Japanese higher education necessitates to enhance the roles of HEIs through human resource cultivation and intellectual activities. To further realize sustainable growth and development of Japanese society and individual's productive life for harmonized human society it ensures that the HEIs will be able to justly fulfill these expected roles. More importantly, the system plans to stand-in and cultivate human resources who are innovative, can think independently, acquires knowledge, skills to discover and solve problems and facilitate collaboration for a more affluent society. In the future model of

higher education in Japan, the MEXT states four primary considerations such as *"to enhance functions of each HEIs considering the improvement of curriculum and approaches of education, rigorous evaluation of learning, admission of adult learners and cooperation with other institutions"*. The strategy is to further consider the improvement of quality of education in order to respond to the changing society and create values by way of inclusive and radical measures to improve the overall education system. In order to ensure the accessibility of high quality education, cooperation between the HEIs within and outside the region, industry and local government requires strengthening and to support and develop methods to innovate higher education through enhancement of competitive funding systems (MEXT, 2017).

3.2   Japan's Role in UNESCO affiliated Projects

Being the second largest financial provider towards dynamic contributions in various characteristics, Japan joined UNESCO in 1951. In order to support and promote ESD programme, Japan continues to fund towards the course of building sustainable society and developing future human resources (JNCU, UNESCO & The Japanese National Commission for UNESCO, 2014). Japan higher education environment changed rapidly due to diversification and globalization of universities (Fukuda, 2016). The Ministry of the Environment in Japan worked with relevant government agencies to implement Environmental Leadership Initiatives for Asian Sustainability (ELIAS) that includes developing model programme for sustainability leadership at HEIs (ChubuUniversity, 2011). In 2002, recommendation on establishing DESD was introduced into the Japanese education system and further implemented in 2005. Japan's action plan for the UN DESD was drafted in 2006 and was further promoted into policies and practices during the 2008 Yokohama Declaration. With support from the Government of Japan, the United Nations University launched the Program on Education for Sustainable Development at the

Institute of Advanced Studies in 2003 (Maruyama, 2010). Responding to these expectations, MEXT required universities to take a variety of steps, including reorganizing their curricula from an ESD perspective, including ESD in their teacher training courses, conducting comprehensive, cross-disciplinary research on sustainability studies, and contributing as central players in regional and international ESD activities (Kawaguchi&Tanaka, 2012).

The MEXT supported the formulation of basic plan with inclusion of the critical components of the ESD to promote education and also brought in revision to allow ESD topics in various subjects. However, MEXT also faced the concern of learning evaluation and how to measure learning activities of ESD. The competency of living or *"ikiru chikara"* was promoted by MEXT for school education in Japan and the competency MEXT requires from students coincided with the outcomes and concept of ESD activities (Maruyama, 2010). Though many attempts by the academics and teachers, the evaluation sets the limitations from the view of the students and their learning outcomes (UNESCO, 2009). Therefore, the need to incorporate student learning outcomes in evaluating the impact of the ESD indicators remains dynamic. Japan also hosted the UNESCO world conference on ESD in 2014 where UN DESD was reviewed and discussions held to further promote ESD. In 2015, the 2030 agenda for sustainable development was adopted with formalization of global action plan (GAP) on ESD in 2016 (JNCU, UNESCO & The Japanese National Commission for UNESCO, 2014). ESD under GAP in Japan formulated a number of support schemes and platforms to systematically integrate activities of ESD with priority action areas concerning policy support, whole institution approaches, educators, youths and local communities. Major activities involve inter sectoral coordination, capacity building, inter-ministerial coordination and activities on youths and

developing databases (JNCU, UNESCO ASPnet and Education for Sustainable Development (ESD), 2015).

While ESD aims to cultivate learners who will help build a sustainable society through their leadership, the set of competencies intends to guide policy makers and provides suggestion. Through identification of learning objectives and activities for course design for curriculum developers, it uses education system to realize and promote the SDG based on respective countries national strategies where educators can choose and acclimatize existing learning contexts (UNESCO, 2017). Based on the above guidance of UNESCO ESD approach, Japan education system aims to cultivate graduates who are able to solve integrated problems concerning modern society and immediate environment to produce new values and actions for a sustainable society. In order to enhance the development, ESD in Japan considered integrating development of the environment, the economy and society at the same time concentrating on *"environmental education, education on international understanding, energy education, disaster risk reduction, education on world heritage and culture properties of the region, biodiversity, climate change and other related education"* (JNCU, 2015).

Although, MEXT and JNCU promote ESD to increase the number of member schools, it also ensures its quality through the guidelines on the UNESCO associated schools also known as UNESCO ASPnet. As per the constitution of UNESCO, ASPnet practices international collaboration and peace (JNCU, 2015). As of June 2015, there are 10,442 UNESCO associated schools in 182 countries. Japan's number of member schools increased after the formalization of DESD and has the largest number of UNESCO associated schools globally with 939 schools as of May, 2015. These schools include the overall school system of Japan. As of January, 2017, ASPUniNet has recorded 19 member universities out of the 780 universities recorded under MEXT (JNCU, 2016). ASPUniNet

is a network for universities that provides participation support, training of teachers for higher level ESD practices, development of ESD leaders and institutionalization of ESD promotion network.

On policy and governmental level, Japan has acquired an enormous contribution and support of UNESCO projects for a betterment of the future and sustainable society. As much as the policies, guidelines and practices are in place, the government does not force institutions to adapt to the requirements but rather encourages institutions to come forward by way of promoting the existing members best practices and recognizing their efforts towards promotion of ESD. However, internalization and globalization of education is a greater concern for sustainable and just society, therefore the promotion of education and ESD has been well adopted by Japan through the necessary revision of their basic Act on Education. MEXT announced the curriculum and instructional guidelines with ESD philosophy are reflected from kindergartens up to high schools in accordance with the Basic Act on Education but for universities it is more of a voluntary protagonist (JNCU, 2015). However, the evaluation of ESD and its competencies also continues to be a challenge on how the success of the curriculum output and learner outcomes would be measured.

3.3   Ritsumeikan Asia Pacific University (APU)

Using APU as a case study for this research serves more than just one purpose. APU is one of the private universities that have freedom to accomplish most operations independently within while at the same time is globally recognized as an international university (APU, Awards and Ranking, 2016) which includes enrollment of students from both developed and developing countries. Majority of the students that APU received and continues to receive are members of UN and UNESCO as well subjected to its global initiatives. It is these learners and students that, after graduation are expected to make difference in their

society and economy. The knowledge, attitudes and skills or soft skills gained throughout their learning process in APU shall serve them with the necessary skills sets that would be applicable to their country needs and wider job market globally. Therefore, the result and recommendation of this thesis will assist the university to further consider inclusion of sustainability competency and promote ESD to enhance the learning environment and create learner pathways to further sustainable development by way of using these skills sets.

APU has been in existence from 2000 based on the vision of humanity, freedom and peace, international mutual understanding and a vision that would shape the future of Asia Pacific Region. For the peaceful development within the Asia Pacific Region, APU has maintained its vision and since inception has welcomed students from 144 countries and regions. These regions include Europe, Middle East, Africa, Oceania, Asia, North America, Latin America and the Caribbean. Student enrolment data shows international students ranked highest at 51% compared to domestic students which stand at 49.9% as of May 2017, pg. 7, (APU, APU Data Book 2017, 2017). The 2017 data book further states other outbound study abroad programs with 439 destinations globally and has agreement with other 465 universities and institutions out of which 152 institutions are successfully in operation with student exchange programs globally.

APU vision towards quality of higher education is to *"strive to nurture graduates who through acceptance and understanding of historical and culture differences will be able to build a peaceful world through international mutual understanding, respect towards humanity, self-respect, peace and freedom"*.[3] APU 2030 vision articulates the direction towards empowering the graduates to change the world by creating new global learning standards, strengthening local and international ties and its educational programs and

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[3] http://en.apu.ac.jp/home/about/content7/

utilizing the multicultural campus to help learners grow by creating diverse values and ideas to envision individual goals and promote lifelong learning (APU, 2016). The university has two major colleges division of Asia Pacific Studies and Division of International Management. Both colleges have undergraduate programs College of Asia Pacific Studies (APS), the College of International Management (APM) and graduate programs for Graduate School of Asia Pacific Studies and Graduate School of Management (GSM).

APU educational objectives have three goals that are common to both colleges which encompasses cooperation, mutual understanding both at local and international level and to cultivate talents to shape relationships with trust to contribute towards development of future societies and economies globally[4] (APU, 2016). While division of Asia Pacific Studies targets to develop both essential and specialized knowledge to create graduates who are talented to contributing towards sustainable development and its common coexistence in the region, College of International Management intends to impart talented graduates with strong business ethics with knowledge of cultural diversity and intercultural communication (Ritsumeikan Asia Pacific University, 2017). In 2016, there was 96.7% overall success rate for job placement. 62.3% placement out of the 93.5% international graduates received employment in Japan (APU, APU Data Book 2017, 2017). The results of job placement shows that most of the international graduates obtains the necessary job training in Japan and tends to remain in Japan rather than going back to their respective country. Majority of the graduates are employed in service sector followed by manufacturing, wholesale and retail industry and others.

The curriculum policy of APU shows that it clearly promotes classroom management by encouraging interactive learning environment thus enhancing the communication skills of

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[4] http://en.apu.ac.jp/home/about/content6/

domestic and international students. The policy allows students to gain skills to understand, analyze their views enabling learners to be independent, critical and systematic thinkers. Lastly, the curriculum policy commends that classes should allow students or learners to think and recognize different issues locally and internationally for them to able to adopt and assimilate to changes and innovation and in addition enhance their leadership skills[5] (APU, Curriculum Policy, 2016).

APU was also ranked one of the top 5 private universities in categories of environment and engagement by Times Higher Education (THE). Other categories included resources and outcomes. Overall in the four categories, APU was placed 21st among all the other Japan universities (APU, Awards and Ranking, 2016). APM and GSM colleges programs have also been recognized by the Association to Advance Collegiate Schools of Business (AACSB) for international standards and accreditation in Business education. College of APS, area study hospitality and tourism received its recognition by United Nations World Tourism Organization Tourism Education Quality Certification (UNWTO TedQual Certification) for its quality education and research program (APU, Accreditation and Self-Assessment, 2016). These ranking and accreditation are internationally recognized and has its own criteria for evaluation and standards for continuous improvement. APU is not subjected to or have included ESD or UNESCO initiatives.

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[5] http://en.apu.ac.jp/home/about/content36/

4 RESEARCH METHODOLOGY

In the literature review, it explained how ESD transformed over the years and the different approaches of frameworks and methods previously used to evaluate the educational objectives and the curriculum in HEIs. The guideline published in 2017 by UNESCO; ESD Goals, Learning Objectives provides a reference that is all inclusive of the eight key competencies of sustainability that can be used to create learning objectives and expected learner outcomes. These key competencies of sustainability are found to be more comprehensive compared to other frameworks or methods that were used in previous studies. Therefore in order for education providers to accomplish expected outcomes of priority 4; "quality and relevance of education" (UNESCO, 2014), and SDG 4, target 4.4 (2); "skills acquisition" and 4.7; "acquiring skills and knowledge and for learners to be able respond to global issues and become responsible citizenship through ESD (UNESCO, 2016), it is vital to include all inclusive and transversal skills into the learning process. These transversal and all-inclusive skills can be attained using the key competencies of sustainability that will assist in the transformation of learner's personal abilities.

Therefore, this research uses the key competencies of sustainability to design a conceptual framework. The framework is than tested for its efficiency by using the case study to see how well these competency outcomes are already reflected in the existing curriculum.

This chapter outlines the research strategy, design and the case study approach. The sub chapter further demonstrates how the evaluative framework for sustainability competencies (EFSC) was developed.

4.1 Research Strategy

The designed EFSC can serve two purposes. Firstly, to assess the overall curriculum (course objective and expected learning outcomes) to show whether it meets the

sustainability competencies or how well sustainability competency concepts are being reflected in an existing curriculum or the syllabus. Secondly, upon further development, can be used to evaluate the learning outcomes where assessment reflects what the learners have achieved or how the curriculum has transformed the learners over adaptation of key competencies of sustainability. However, assessment of learners or learning outcomes is not discussed in this research. The research only focuses on curriculum design, development and ways the sustainability competencies shall be implemented. Therefore, this research looks at the first part of the frameworks purpose. This is for the reason that APU is not recognized as one of the UNESCO project institutions and neither has implemented the ESD requirements.

To answer the main research question; **How to evaluate the key competencies of sustainability in the existing curriculum?** The curriculum focused in this study is undergraduate program as example. There are many methods as shown in the literature review and mentioned above that can be used to evaluate the curriculum competencies. However, these methods are not all inclusive of such general competencies compared to the proposed key competencies of sustainability published by UNESCO (UNESCO, Education for Sustainable Development Goals Learning Objectives, 2017). Therefore, to answer the main research question, an EFSC was designed to test the existing curriculum. In order to test the evaluative framework, APU College of Asia Pacific Studies was used as case study. Primarily area of study environment and development (ED) and culture, media and society (CSM) at 300 levels were used as an example to show how the EFSC can be used to evaluate the existing curriculum. The research took note of the current reform in curriculum development in the College of Asia Pacific Studies which is in progress. Thus to get a comprehensive understanding of the course objectives and learner outcomes, syllabus for each subject was used to model the framework.

The findings will express whether APU already meets the outcome requirements of sustainability competencies or not and if yes, then to which level are the outcomes of sustainability competency met. The approach also makes further recommendations as to how each competency can be unpacked (as shown in chapter 6.3) and included in the syllabus and curriculum. This can be used by College of APS while they are currently reforming their educational and curriculum objectives. This results and framework can be used for advancement of the curriculum design and syllabus to fully meet the competencies of sustainability. The results would further provide references on ways as to how sustainability curriculum could be included into the higher education system. Thus, this will aid lessen the disparities among countries and HEIs who are moving towards internalization and cross border recognition of their programme.

4.2   Research Design

In the previous chapter the background and current course development of APU was provided. In particular, the curriculum selected to test the effectiveness of evaluative framework (conceptual framework), were from College of Asia Pacific Studies (APS) undergraduate capstones majors at 300 levels. These 300 level courses were from the area of studies (i) E&D (ii) CSM at 300 levels. The two case studies were randomly chosen for the purpose of (1) testing existing curriculum/syllabus which is not subjective to ESD concept and (2) to suggest framework or a methodology on how to evaluate the key competencies of sustainability in the existing curriculums/syllabus. The primary data obtained in this research uses the designed EFSC (as shown is *Table 1*).

To test the framework and existence of sustainability competencies, 11 existing syllabus from ED and 10 existing syllabus from CSM were chosen. The course learning objectives and expected learning outcomes were major focus however; to get a comprehensive result

the overall syllabus was evaluated. It was also noted that the syllabus design has standard format for all subjects but in some cases all fields were either not filled or were partially filled. Interpretations were based using the criterion outcomes of the EFSC developed as a methodology to evaluate the existing curriculum. Each criterion has its proposed three outcomes and standard key words that were used as indicators to evaluate the existing syllabus. The case study was chosen only to model the conceptual framework, outline its significance in evaluating the existing curriculum or to show how existing curriculums could be evaluated for sustainability competencies.

4.3 Designing the Evaluative Framework for Sustainability Competencies

4.3.1 Evaluative Framework for Sustainability Competencies (EFSC)

The EFSC was designed as a conceptual framework to evaluate the course learning objectives and expected course learning outcomes. In case of APU, syllabus was used to provide the full description of the courses/subjects. As noted that the syllabus outline used in this research are the existing syllabus being developed under the curriculum policy of the division of academic affairs and are not subjected to inclusion of ESD guidelines.

The EFSC uses the eight key competencies of sustainability from the UNESCO framework as shown in the table 3 below. These are used as criterions from which the three outcomes for each criterion are designed and stated accordingly (UNESCO, 2017).

Table 3 shows the UNESCO Eight Key Competencies of Sustainability. This competencies are used as theory to design and propose the conceptual EFSC.

Key Competencies of Sustainability [UNESCO, 2017]
Systems thinking competency: the abilities to recognize and understand relationships; to analyse complex systems; to think of how systems are embedded within different domains and different scales; and to deal with uncertainty.
Anticipatory competency: the abilities to understand and evaluate multiple futures – possible, probable and desirable; to create one's own visions for the future; to apply the

precautionary principle; to assess the consequences of actions; and to deal with risks and changes.
Normative competency: the abilities to understand and reflect on the norms and values that underlie one's actions; and to negotiate sustainability values, principles, goals, and targets, in a context of conflicts of interests and trade-offs, uncertain knowledge and contradictions.
Strategic competency: the abilities to collectively develop and implement innovative actions that further sustainability at the local level and further afield
Collaboration competency: the abilities to learn from others; to understand and respect the needs, perspectives and actions of others (empathy); to understand, relate to and be sensitive to others (empathic leadership); to deal with conflicts in a group; and to facilitate collaborative and participatory problem solving.
Critical thinking competency: the ability to question norms, practices and opinions; to reflect on own one's values, perceptions and actions; and to take a position in the sustainability discourse
Self-awareness competency: the ability to reflect on one's own role in the local community and (global) society; to continually evaluate and further motivate one's actions; and to deal with one's feelings and desires.
Integrated problem-solving competency: the overarching ability to apply different problem-solving frameworks to complex sustainability problems and develop viable, inclusive and equitable solution options that promote sustainable development.

Source: Adopted from UNESCO [UNESCO, Education for Sustainable Development Goals Learning Objectives, 2017]

The word 'criterion' refers to the eight key competencies of sustainability proposed by UNESCO ESD goals and learning objectives (UNESCO, 2017) and each criterion proposes three outcomes as sub-competencies for each of the sustainability competency. Therefore, this study develops the set of outcomes under each of the criterion to evaluate the existing curriculum against the expected outcomes of sustainability competencies and the overall purpose of the ESD. Under each criterion, three outcomes appropriate to reflect the necessary competency was articulated to make the evaluation more user- friendly. Thus

the criterion outcome forms as standard guidelines for the key competencies of sustainability. The outcomes for each criterion are articulated with the essence of the criteria definition provided by UNESCO key competencies of sustainability. The table below shows the proposed EFSC that reflects the criterion outcomes used for evaluation of overall curriculum. The purpose of having the outcomes for evaluation of curriculum states the importance of the reflection of each criterion in the curriculum outline in this case the syllabus. It is noted that more than one outcome that is measurable can be created from a given competency (Hartel & Foegeding, 2004). Outcome provides specific statements in a unique way that is quantifiable and describes what exactly a learner or student will be able to do. In other words these are the outcomes that leaners need to develop, a transformation on how graduates ought to think and act (UNESCO, 2017). While competencies are general and defines the desired, preferred skills, behaviors and knowledge, it enables graduates to successfully fit in the society or work.

Table 4 showing the designed evaluative framework for sustainability competency with each criterion outcomes

Criteria	1	Systems Thinking
Outcomes	1.1	The curriculum uses different methodologies, principles, frameworks, numerical concepts and structures to allow learners gain skills to recognize and understand different kinds of relationships concerning social, environmental and economy.
	1.2	The curriculum teaches learners how to deal with uncertainties by critically analyzing complex systems.

	1.3	The curriculum allows learners to obtain numeracy skills and the ability to think how different systems within different scales and domains are embedded locally and globally.
Criteria	**2**	**Strategic**
Outcomes	2.1	The curriculum allows learners to gain literacy skills, short and long term planning skills, developing and implementing innovative ideas to advance sustainability.
	2.2	The curriculum reflects abilities to implement innovative solutions both at locally and globally.
	2.3	The curriculum teaches learners collaboration, partnership and communication skills.
Criteria	**3**	**Anticipatory**
Outcomes	3.1	The curriculum teaches skills that allows learners to understand and evaluate multiple, desirable and possible futures and ability to create own vision for the future.
	3.2	The curriculum provides necessary knowledge, skills and attributes to deal with risks and changes and assess consequences of actions.
	3.3	The curriculum provides knowledge and skills on the application of the precautionary principle.
Criteria	**4**	**Normative**
Outcomes	4.1	The curriculum provides abilities for learners to understand and reflect the norms, values and one's action towards sustainability
	4.2	The curriculum provides skills to negotiate sustainability values, principles, goals and targets.
	4.3	The curriculum delivers knowledge and skills to deal with conflict of interests, trade-offs, contradictions and uncertainty.
Criteria	**5**	**Critical thinking**
Outcomes	5.1	The curriculum allows learners to questions practices, opinions and norms while reflecting their own values
	5.2	The curriculum offers knowledge and abilities to take actions and value perceptions towards sustainability discourse
	5.3	The curriculum address sustainability issues and potential risks
Criteria	**6**	**Collaboration**
Outcomes	6.1	The curriculum allows provision for learners to learn and develop empathic

		leadership skills by respecting and understanding the needs, perspectives and actions of others and being sensitive to others
	6.2	The curriculum provides skills to deal with conflicts in groups and enhances communication skills
	6.3	The curriculum facilitates teamwork, cooperating, collaborative and participatory problem solving abilities for learners to develop necessary skills
Criteria	**7**	**Integrated problem-solving**
Outcomes	7.1	The curriculum clearly outlines the competencies required to integrate problem solving abilities and allows learners to think critically for unified solutions to difficult issues
	7.2	The curriculum provides learners the capacity and skills to solve complex sustainability problems using problem-solving frameworks and information technology to develop viable, inclusive and equitable solutions
	7.3	The curriculum promotes sustainable development concerning environmental, social and economic concepts and its application skills
Criteria	**8**	**Self-awareness**
Outcomes	8.1	The curriculum reflects leadership, innovative and decisive skills and motivates learners own role in the local or global community
	8.2	The curriculum teaches skills to continuously evaluate and further motivate one's action and abilities to adapt to situations and changes
	8.3	The curriculum teaches how to deal with individual's feelings and desires towards sustainability discourse and act as a responsible local and global citizen taking into account customer and business awareness

(Source: Author)

4.3.2 List of Standard Key Words Related to the Eight Sustainability Competencies

The list of standard keywords aids as a general glossary for the faculty or colleges in designing the curriculum or syllabus. In addition, the keywords can be used to elaborate the competency outcomes based on the type of the course and its objective. However, in this case, the list of standard key words was created to further evaluate the syllabus as most of the existing syllabus did not demonstrate the full criterion outcomes outlined in the learning objectives and expected learning outcomes. The standard key words used as

sustainability competency characteristics are examined in the syllabus learning objectives and expected learning outcomes, however, if the standard key words or characteristics are not reflected under these two categories than the overall syllabus was considered for evaluation.

These standard key words also known as sustainability competency characteristics may be considered while creating learning objectives and expected learning outcomes for new curriculum, syllabus or can be used during redesigning of the existing curriculum or syllabus. However, for the purpose of evaluating the learner outcomes or what the syllabus wants to teach the learners, the key words should be supported with a verb or action that learners are able to perform. This should be measurable as a learner outcome or output at the end of the learning and teaching. The EFSC additionally, proposes expected learner outcomes in the chapter 6.3 basically outlining how it should be written in a syllabus and curriculum. Therefore, this conceptual framework recommends further advancement on how to use this framework to develop, evaluate and assess any course at any division level for sustainability competencies.

Table 5 shows the key sustainability competency and standard keywords under each criterion outcomes

	Criterions	Outcome 1.1	Outcome 1.2	Outcome 1.3
Key Sustainability	**Systems Thinking**	Complex systems, networks, structures, framework, principles, procedure, practices, modus operandi, kinds of relationship, numerical concepts	Uncertainty, firm actions, questionable norms, critical analyses	Domain, scales, size, standards, systems, frameworks, recognizing & understanding relationships

	Innovative actions, creative, critical thinking, developing & implementing ideas, short & long term planning	Implementation strategies, targets, actions, sustainability advancement	Collaboration, partnership, communication skills, group activities
Strategies	Innovative actions, creative, critical thinking, developing & implementing ideas, short & long term planning	Implementation strategies, targets, actions, sustainability advancement	Collaboration, partnership, communication skills, group activities
Anticipatory	Evaluation skills, desirable and possible futures, creating vision, proactive, preventative actions	Assessing consequences, dealing with risks and changes	Application, precautionary principles, implementation skills
Normative	Norms, values, cultures, one's action, attributes	Negotiation skills, sustainability values, goals, principles, targets, respecting others, reflecting targets	Dealing with conflict of interest, trade-offs, resource management, uncertain knowledge, behaviour and understanding one's action
Critical Thinking	Questioning practices, opinions, norms, rationalize concepts, reflecting own values	Abilities to take action, valuing others perception, sustainability discourse	Sustainability issues, decision making, reflecting opinions and actions
Collaboration	Empathic leadership, understanding and respecting needs, perspective and actions of others, sensitivity to issues, humanity	Dealing with conflicts, communication skills	Facilitates teamwork, collaborative, participatory approach, problem solving skills
Integrated Problem Solving Approach	Promoting sustainable development, problem-solving abilities, critical thinking skills, equitable and inclusive solutions	Problem solving frameworks, complex sustainability problems, use of information technology for unified solutions	Facilitates teamwork, collaborative, participatory approach, problem solving skills
Self-Awareness	Leadership skills, motivational skills, building capacity at local and international level	Evaluations skills, motivating one's action, abilities to adapt to changes	Dealing with one's feeling, sustainability discourse, acting as responsible local and global citizen, customer and business awareness

(Source: Author)

4.4   Approaches to Data Analysis

This study uses qualitative approach for data collection and analysis. The primary study uses descriptive and interpretative conceptual framework to evaluate the case study to test the competency level of the existing curriculum and syllabus. To ensure that the data is more objectively described, a scale was developed to rate the findings and scores were given to each of the competencies. The scores for each competency were given based on the word reflection or phrases of criterion outcomes from the expected learning outcomes and learning objectives of each syllabus under the area of study for ED and CSM. Each competency criterion contains three proposed course learning outcomes which upon evaluation gives the final score of each sustainability competency. The figures are used to analytically rationalize the findings. An example below in 5.5 shows how the sub scores were given using the criterion outcomes and standard or relative keywords to sum up the overall score.

4.5   Conducting Evaluation

The overall score was provided based on each of the competencies of sustainability. During the evaluation of the syllabus, each standard keyword or relative keywords of sustainability competency identified in the learning objectives and expected learning outcomes were rated objectively. In cases where the standard keywords were not reflected, synonyms (relative) or closer definitions were used. These were then added up to give the overall scores for each the competency.

Table 6 shows allocation of the rating for each competency and sub-competencies

Scores	Range		
Overall Competency Score	**1**	**2**	**3**
	Does not meet the competency	Partially meets the competency	Meets at Substantial/significant Level
Sub - scores for	**0**	**0.5**	**1**

criterion outcomes using keywords	Does not meet the outcomes	Partially meets the outcomes	Fully meets the outcome

(Source; Author)

For the criterion outcomes sub-scores, score 0 describes that the curriculum outline does not reflect the criterion outcome and the standard keywords or the curriculum was not clear enough to judge. Score 0.5 describes that the criterion outcomes and keywords are partially met using similar phrases or synonyms. Score 1 is given where the criterion outcomes are evident directly with standard or relative key words.

The indirect words refer to any phrases with similar meaning or synonyms of standard key word used in the syllabus while direct words refer to syllabus reflecting relative and standard keywords as per *Table 6*. Where at least 3 criterion outcomes of each sustainability competencies are met, the syllabus shall attain the full score of the overall competency and call for substantial compliance. The overall competency depicts the total scores for each of the criterion outcomes when added together (*Outcome 1 + Outcome 1.2 + Outcome 1.3 = Overall Total Competency Scores*). Overall score 1 show that the particular criterion or sustainability competency does not meet the competence or meets at below average. The overall score 2 partially meets the competence and score 3 meets the competence at substantial or significant level.

A full example is shown in appendix 9.1 and 9.2 for one of the subject from area of study environment and development. Approval to use the subject ED01 as an example in this research was taken from the Professor in charge for the syllabus and design. The syllabus was evaluated using the above described framework. However, a portion of the evaluation for ED01 highlighted below for one competency "systems thinking", describes how findings were reached. The diagram below shows the syllabus for ED01 with the course

objectives and standards for course completion (expected learner outcomes). The standard

or relative keywords or competency outcomes are highlighted.

Figure 4 Shows ED01 syllabus course objectives and learner outcomes. The highlight shows the reflection of standard or relative keywords and outcomes description.

In order to compile the findings, a table was designed with the following features. It gives

a summary of how the each criterion outcomes are met using either the definition or the

standard and relative keywords.

Table 7 Shows the outline of results collection for ED01 as an example

No	Criterion	Standard Keywords	Score	Relative Keywords	Synonyms
	ED01				
1	**Systems Thinking** [Overall Score = (1.1 +1.2+1.3)]		**2.5**		
1.1	The curriculum uses different methodologies, principles, frameworks, numerical concepts and structures to allow learners gain skills to recognize and understand different kinds of relationships concerning social, environmental and economy.	Complex systems, networks, structures, framework, principles, procedure, practices, modus operandi, kinds of relationship, numerical concepts	1	methods/ concepts/ system design	
1.2	The curriculum teaches learners how to deal with uncertainties by critically analyzing complex systems.	Uncertainty, firm actions, questionable norms, critical analyses	0.5		Future mechanism
1.3	The curriculum allows learners to obtain numeracy skills and the ability to think how different systems within different scales and domains are embedded globally.	Domain, scales, size, standards, systems, frameworks, recognizing & understanding relationships	1	Relationship between env. & development. know-how of systems	

(Source: Author)

According to criteria outcome 1.1 the ED01 syllabus uses different system design and technologies to explain a concept from an interdisciplinary perspective and also reflects standard keywords such as concepts and systems design and methods or procedure to explain the concept therefore gets full sub-score of **1 (Outcome 1.1 sub-score)**. Criterion outcome 1.2 deals with uncertainties and critical analysis, however the outcomes are not clear but uses relative word such as future mechanism. Dealing with uncertainties is dealing with future; something that one thinks may happen or will happen due to a particular action. The syllabus does not show how the learners will obtain skills in dealing with future but provides knowledge (understanding) about future mechanisms therefore scores **0.5 (Outcome 1.2 sub-score)**. Similarly for criterion outcome 1.3, it describes that the learners should be able to gain an understanding of different systems and how they are embedded. Therefore, according to the ED01 syllabus it teaches different systems for learners to understand the concept and relationship between all domains and scales of pollution   and the know-hows thus the sub criterion 1.3 scored **1 (Outcome 1.3 sub-score)**. To get the score for overall system thinking competency, Outcomes 1.2, 1.2 & 1.3 are added. In this case the overall score for systems thinking is 2.5, states that ED01 partially meets the requirements of the above sustainability competency. Similar methods were used for other competencies and syllabus and the results are outlined in the next chapter "findings" and the methodology is further deliberated in the result analysis.

4.6   Research Challenges

One of the major challenges in using this methodology is testing the right document. In general curriculum is a broader aspect of a course or programme. At the same time syllabus used in the case study almost related to how the course curriculum is written. An effective and transparent curriculum has clear learning goals, activities and assessment of the expected learning outcomes (Nulty, 2012). The educational objective and diploma policy of the case study university does specify the curriculum content; however the content is not comprehensive enough to use this methodology to give a clear indication on the eight listed sustainability competencies. Activities and assessment are not reflected in the above two documents. To provide a comprehensive finding syllabus were used as it

was found to be more standardized and gives an actual reflection of how teaching and learning emerges at subject level.

The research uses undergraduate program for College of Asia Pacific Studies at 300 levels (capstones majors), particularly focused on two areas of studies to show how the framework can be applied in any setting. The findings will not be subjected to the overall undergraduate program for study area of environment and development and culture, media and society. Therefore, it cannot conclude that the overall undergraduate program for the area study of environment and development or culture, media and society meets or does not meet the requirements of evaluative framework for sustainability competencies. It only gives results for 300 levels. To get the overall area of study result, full scale evaluation from 100 to 400 levels needs to be conducted that will also show the transition of competencies at each level. This may altogether give clearer and comprehensive results if one needs to find out the effectiveness of the overall course.

Secondly, at this moment, this research cannot focus on teaching and learning, that is actual teaching in classroom and learner outcome assessment since the curriculum or courses are not aligned to the ESD. It is not transparent to evaluate or assess the learner outcomes using ESD or sustainability concept because first one must ensure that the courses, curriculum and syllabus are aligned to ESD or incorporates sustainability competencies before the output can be measured.

5 FINDINGS AND RESULTS ANALYSIS

This chapter uses primary data to show the kind of results that can be obtained using the evaluative framework for sustainability competencies. The findings show the case study results and how the sustainability competencies are reflected in the existing syllabus. Tables 8 & 9 in this section show the overall total scores for each of the criterion and the sub scores for each of the three outcomes for both **area of study.**

5.1 Study Area I: Environment and Development (ED)

Table 8 Showing Summary of Sustainability Competency Criterion Outcomes Scores for Study Area for Environment and Development at 300 Levels

Area of Study - Environment and Development at 300 level												
Criteria	**Outcomes**	**ED01**	**ED02**	**ED03**	**ED04**	**ED05**	**ED06**	**ED07**	**ED08**	**ED09**	**ED10**	**ED11**
Systems Thinking	*Outcome 1*	1	1	1	1	1	1	1	1	1	1	0.5
	Outcome 2	0.5	0.5	0.5	1	0.5	0.5	0.5	1	0.5	0.5	0.5
	Outcome 3	1	1	1	1	0.5	1	0.5	1	0.5	0.5	1
Total Scores		**2.5**	**2.5**	**2.5**	**3**	**2**	**2.5**	**2**	**3**	**2**	**2**	**2**
Strategies	*Outcome 1*	1	0.5	1	1	1	1	0.5	1	0.5	1	0.5
	Outcome 2	0.5	0.5	1	0.5	0.5	1	0	1	1	0.5	0.5
	Outcome 3	1	1	0.5	0.5	1	0.5	0.5	1	0.5	1	1
Total Scores		**2.5**	**2**	**2.5**	**2**	**2.5**	**2.5**	**1**	**3**	**2**	**2.5**	**2**
Anticipatory	*Outcome 1*	0.5	0.5	1	1	0.5	0.5	0.5	1	1	1	0.5
	Outcome 2	1	0	1	0.5	1	0.5	0.5	1	0.5	0.5	0.5
	Outcome 3	0.5	0.5	1	1	1	1	0	0.5	1	1	0.5
Total Scores		**2**	**1**	**3**	**2.5**	**2.5**	**2**	**1**	**2.5**	**2.5**	**2.5**	**1.5**
Normative	*Outcome 1*	0.5	0.5	0	0.5	0.5	1	0.5	1	0.5	1	0.5
	Outcome 2	0.5	1	1	0	1	1	1	1	0.5	0.5	1
	Outcome 3	0.5	1	1	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5
Total Scores		**1.5**	**2.5**	**2**	**1**	**2**	**2.5**	**2**	**2.5**	**1.5**	**2.5**	**2**
Critical Thinking	*Outcome 1*	0.5	1	1	1	1	1	0.5	1	1	1	0.5
	Outcome 2	0.5	0.5	0.5	0.5	1	0.5	0.5	1	0.5	0.5	0.5
	Outcome 3	0.5	1	1	1	1	1	1	1	1	0.5	1
Total Scores		**1.5**	**2.5**	**2.5**	**2.5**	**3**	**2.5**	**2**	**3**	**2.5**	**2**	**2**
Collaboration	*Outcome 1*	1	1	0.5	0.5	0.5	0.5	0	1	0.5	0.5	1
	Outcome 2	0.5	0.5	0	0	0.5	0.5	0.5	0.5	0.5	1	0.5
	Outcome 3	0.5	1	1	1	1	0.5	0.5	1	1	1	1
Total Scores		**2**	**2.5**	**1.5**	**1.5**	**2**	**1.5**	**1**	**2.5**	**2**	**2.5**	**2.5**
Integrated Approach	*Outcome 1*	1	0.5	1	0.5	0.5	1	0.5	1	1	0.5	1
	Outcome 2	1	1	1	1	1	0.5	0.5	0.5	1	1	0.5
	Outcome 3	0.5	0.5	1	1	1	0.5	1	0.5	0.5	1	1
Total Scores		**2.5**	**2**	**3**	**2.5**	**2.5**	**2**	**2**	**2**	**2.5**	**2.5**	**2.5**
Self Awareness	*Outcome 1*	1	1	1	1	1	1	0.5	1	0.5	0.5	0.5
	Outcome 2	1	1	1	1	1	0.5	0.5	1	1	0.5	0.5
	Outcome 3	0.5	1	1	0.5	1	0.5	0.5	1	1	0.5	0.5
Total Scores		**2.5**	**3**	**3**	**2.5**	**3**	**2**	**1.5**	**3**	**2.5**	**1.5**	**1.5**
Total average Scores		**2.125**	**2.25**	**2.5**	**2.188**	**2.44**	**2.19**	**1.56**	**2.69**	**2.19**	**2.25**	**2**
Ratio		**0.71**	**0.75**	**0.83**	**0.73**	**0.81**	**0.73**	**0.52**	**0.90**	**0.73**	**0.75**	**0.67**

For the area study of environment and development at 300 levels had eleven subjects as stated in *Table 7* above. Each of the syllabuses at 300 levels for area of study environment and development was evaluated using its course objective and expected learning outcome against the proposed criterion outcomes for sustainability competencies. While there are eight competencies, each competency has a maximum total score of 3 and minimum score of 1. The figures in 6.1.1 below show the sustainability competency illustrations. The pattern defines for itself how well each of the competencies is reflected in each of the syllabus.

5.1.1 Competence scores for individual subjects

Figure 5 Showing total scores for each criterion outcomes of the framework for sustainability competencies for syllabus ED01 under College of APS at 300 undergraduate levels

ED01 syllabus in *Figure 5* shows that all the individual total scores are above average quotient meaning that the each criterion had scored 1.5 or more. Criterion normative and critical thinking scored just on average 1.5. The rest of the criterions had scored 2 and 2.5 presenting an overall average subject score of *2.13.* This illustrates that syllabus ED01 *partially meets* the criterion outcomes of the evaluative framework for sustainability competencies. However, more emphasis is required to enhance criterion critical thinking and normative. However, more emphasis is required to enhance normative and critical

thinking in the syllabus learning objectives and expected learning outcomes. These will allow student or learners abilities to understand and question one's action, the uncertain knowledge of sustainability principles, roles of negotiating sustainability values and taking position in sustainability discourse (UNESCO, 2017).

Figure 6 Showing total scores for each criterion outcomes of the framework for sustainability competencies for syllabus ED02 under College of APS at 300 undergraduate levels

Figure 6 shows ED02 syllabus noted *2.25* as an overall average score for the subject. However one of the criterion anticipatory scored on a below average scale of 1on individual criterion level that categorizes that the particular criterion outcomes does not meet the competency level. Anticipatory, as important as any other criterion in the sustainability competency framework as it teaches and provides skills to learners or students to build capabilities to comprehend and develop desired futures, be able to evaluate consequences of actions and develop ability to deal with risk and changes (UNESCO, 2017). Overall all other criterion recorded 2 or more showing that the individual criterion outcomes partially meets the competency level while one criterion 8 self-awareness shows that it fully meets its competency level. As per the average score of the overall curriculum and in accordance to the standards of criterion outcomes, ED02 curriculum ***partially meets*** the outcomes of the evaluative framework for sustainability competencies.

Figure 7 Showing total scores for each criterion outcomes of the framework for sustainability competencies for syllabus ED03 under College of APS at 300 undergraduate levels

ED03 syllabus as per *Figure 7* recorded an overall mean score of ***2.50*** which illustrates that the subject ***partially meets*** the criterion outcomes of the evaluative framework for sustainability competencies. The finding also shows that three criterions namely anticipatory, integrated approach and self-awareness on individual scale fully meets its individual criterion outcomes. This demonstrates that the syllabus fully captures all these three aspects of the criterion outcomes and the necessary knowledge stands to be transferred to the learners or students. However, the syllabus needs to be further redesigned to enhance the reflection of criterion "collaboration" into the curriculum. This will assist to enhance learners and students collaborative and problem solving skills through empathic leadership. The other three criterions systems thinking, strategies and critical thinking overall scored 2.5 while criterion normative scored 2. These criterions outcomes needs to be well captured in the subjects learning objective and expected learning outcomes.
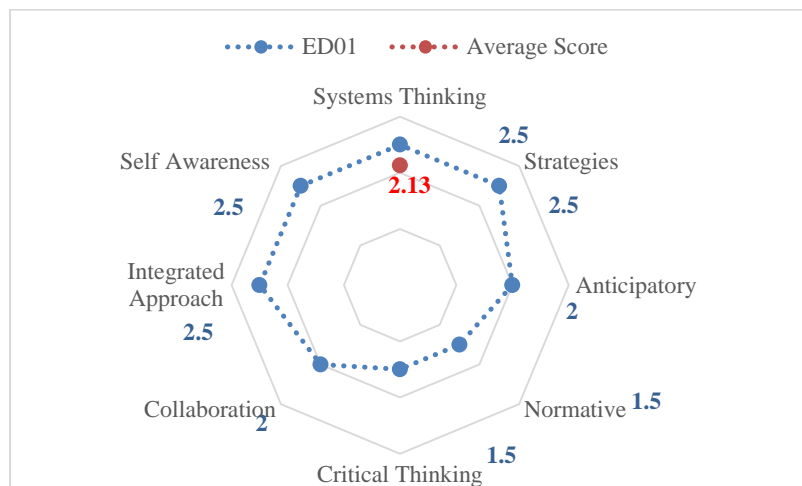
Figure 8 Showing total scores for each criterion outcomes of the framework for sustainability competencies for syllabus ED04 under College of APS at 300 undergraduate levels

ED04 syllabus in *Figure 8* shows the overall mean score of ***2.19*** which demonstrate that the subject ***partially meets*** the total outcome of the evaluative framework for sustainability competencies. Criterion systems thinking scored an overall score of 3 stating that on individual level the competency fully meets the requirement of the criterion and its outcomes. While the other four criterions anticipatory, critical thinking, integrated approach and self-awareness scored 2.5 compared to criterion normative which scored the lowest at 1 and criterion strategies scored 2. For those criterions that scores 2.5 or below should be considered during the process of redesigning curriculum or syllabus. This should be demonstrated well in learning objectives and expected learning outcomes of this curriculum. By way of strengthening criterion normative, it is essential for students and learners to first understand and be able to evaluate multiple systems and accept changes in situations to enrich the proposed vision of sustainability simultaneously enriching their skills and knowledge.
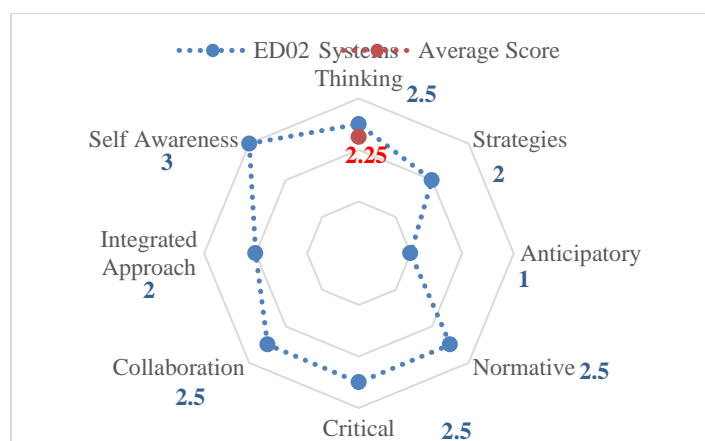
Figure 9 showing the total scores for criterion outcomes under the framework for sustainability competencies for syllabus ED05 under College of APS at 300 undergraduate levels

ED05 curriculum as per *Figure 7* showed quantitatively distributed scores at all criterion level. The overall scores for each criterion were 2 or above with an average subject score of *2.44* illustrating that the syllabus ***partially meets*** the outcomes of the evaluative framework for sustainability competencies. The figure also illustrates that self-awareness and critical thinking overall scored 3 meeting full criterion outcomes requirement of the sustainability competency at individual level. However, further improvements are required during redesigning for criterion scores that stands at 2 or 2.5 so that the syllabus fully meets the outcomes of the sustainability competencies.

Figure 10 showing the total scores for eight criterion outcomes under the framework for sustainability competencies for syllabus ED06 under College of APS at 300 undergraduate levels

Figure 10 illustrates ED06 syllabus with an overall average score of ***2.19*** indicating that the subject ***partially meets*** the criterion outcomes of the framework for sustainability competency. While four criterions systems thinking, strategies, normative and critical thinking scored 2.5, criterion 6 collaboration scored lowest score of 1.5. The other three criterions anticipatory, integrated approach and self-awareness scored 2 independently for each criterion. Criterion 6 collaboration needs a greater emphasis during redesigning of curriculum and syllabus compared to the other criterion as collaboration competency provides learners and students with attributes that enhances the communication skills and empathic leadership know how to enable collaborative problem solving capabilities.
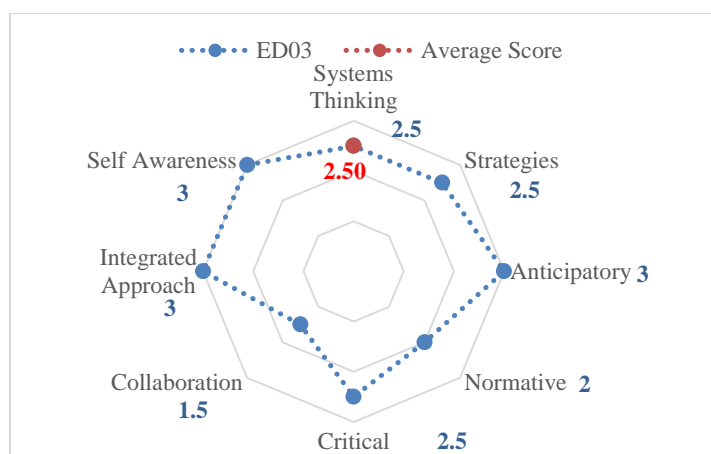

Figure 11 showing the total scores for criterion outcomes under the framework for sustainability competencies for syllabus ED07 under College of APS at 300 undergraduate levels

ED07 syllabus as per *Figure 11* illustrates that the overall average subject score of ***1.56*** affirms that the curriculum ***does not meet*** the requirements of the criterion outcomes of the framework for sustainability competency. However, on specific level four out of the eight criterion scored 2 showing that the outcomes of these criterions partially meets the requirement of the framework for sustainability competency, three criterion scored 1 and one criterion scored 1.5 which according to the evaluation confirms that these outcomes of the criterions do not meet the requirements of the framework for sustainability

competency. The syllabus may meet other aspects of the studies relevant to the division of Asia pacific studies, however having these sustainability competencies enhances the learning objectives and expected learning outcomes of a curriculum or syllabus as it allows learners and students to get involved more conscientiously and productively in the area of studies by gaining the relevant knowledge, skills and build their capacities in a broadly attentive manner.
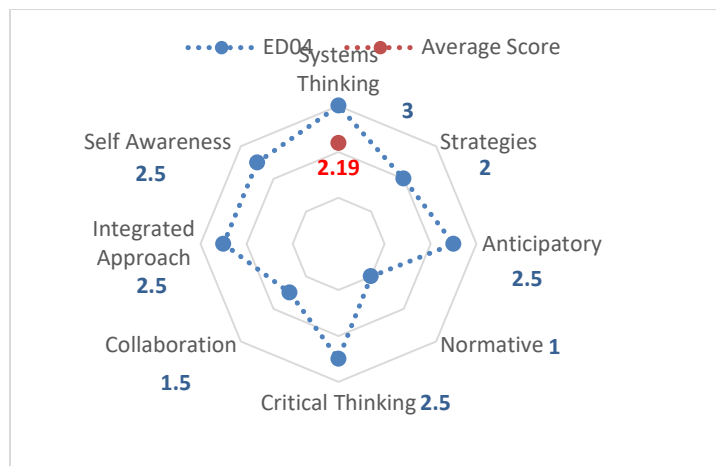

Figure 12 showing the total scores for eight criterion outcomes under the framework for sustainability competencies for syllabus ED07 under College of APS at 300 undergraduate levels

Figure 12 shows ED07 syllabus demonstrating one of the highest average scores for the overall criterion outcomes in the environment and development department scoring *2.69*. However, as per the overall evaluation result the subject ***partially meets*** the requirement of the framework for sustainability competency. Four of the criterion scored an overall 3 points demonstrating that those criterions outcomes fully meet the competency at individual level. Criterion 7 integrated problem solving approach requires restructuring to ensure that the overall outcomes continue to be well reflected. Integrated problem solving criterion serves as the primary capability for the overall sustainability competency that encompasses the sustainability issues and presents different types and categories of problem solving frameworks while promoting sustainable development (UNESCO, 2017).

Three other criterions overall scored 2.5 each which recommends for redesigning to capture the essence of the each criterion outcomes.
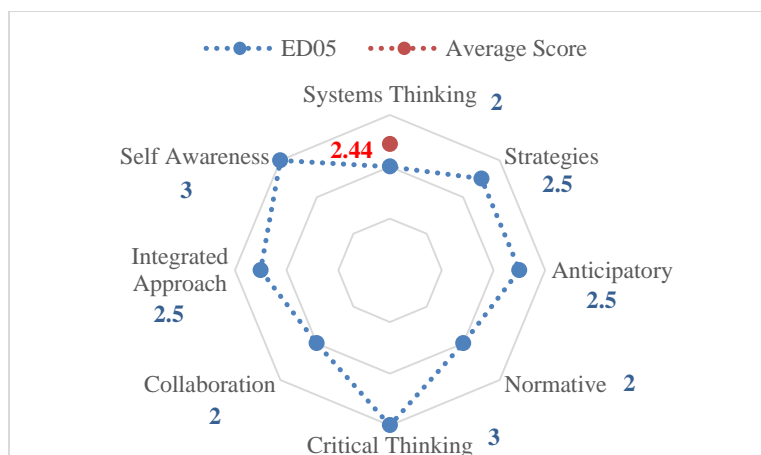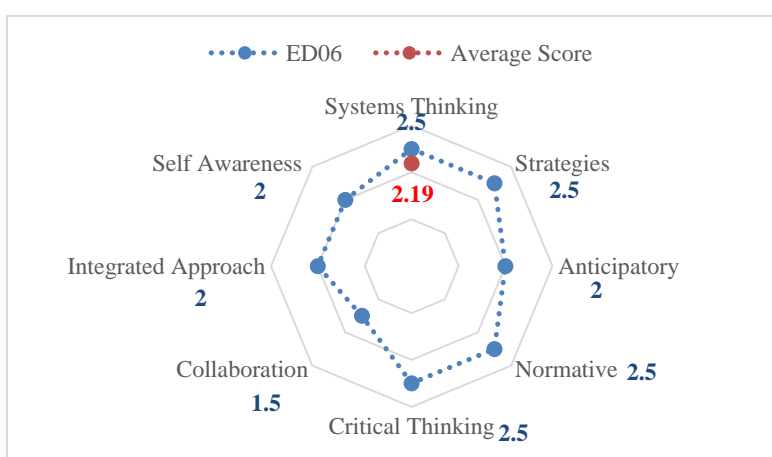
Figure 13 showing the total scores for the eight criterion outcomes under the framework for sustainability competencies for syllabus ED09 under College of APS at 300 undergraduate levels

ED09 syllabus in *Figure 13* shows that four of the criterions in this syllabus scored an overall score of 2.5 signifying that anticipatory, critical thinking; integrated problem solving approach and self-awareness partially meets the criterion outcomes for sustainability competency. While three other criterions systems thinking, strategies and collaboration overall scored 2, criterion normative scored the lowest at 1.5. The findings illustrates that the overall average score of this subject stands at **2.19** stating that it ***partially meets*** the overall criterion outcomes of the framework for sustainability competency. Criterion normative deals with social aspects of sustainable development where learners and students are encouraged to understand and gain necessary skills through the norms and values of the society, understand the indeterminate knowledge and paradoxes to negotiate sustainability values and principles sustainably.
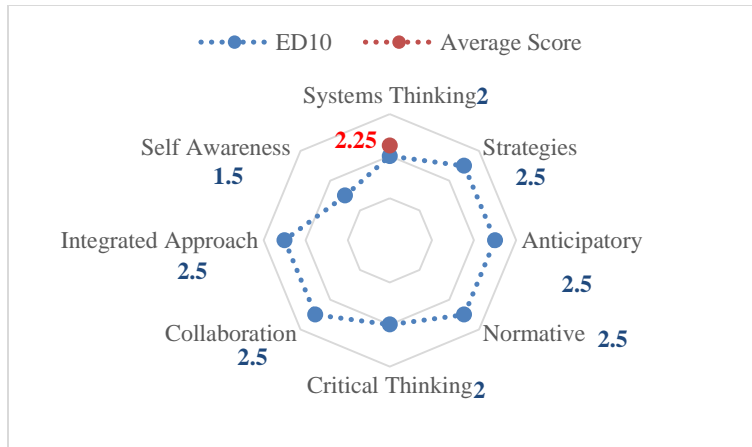
Figure 14 showing the total scores for the eight criterion outcomes under the framework for sustainability competencies for curriculum ED10 under College of APS at 300 undergraduate levels

Figure 14 illustrates ED10 syllabus shows that five of the criterion strategies, anticipatory, normative, collaboration and integrated problem solving approach each scored 2.5. The overall average subject score of *2.25* indicated that the subject *partially meets* the criterion outcomes of the framework for sustainability competencies. Criterion system thinking and critical thinking overall scored 2 points which states that on single score level it also partially meets the individual sustainability competency requirements. Criterion self-awareness scored the lowest rate of 1.5 which means that the outcomes of the criterion do not meet the sustainability competency at that particular criterion level. The evaluation results suggests further emphasis on self-awareness criterion as the competency demonstrates skills and abilities of learners and students to reflect their roles on global society level by understanding, motivating and evaluating ones action.
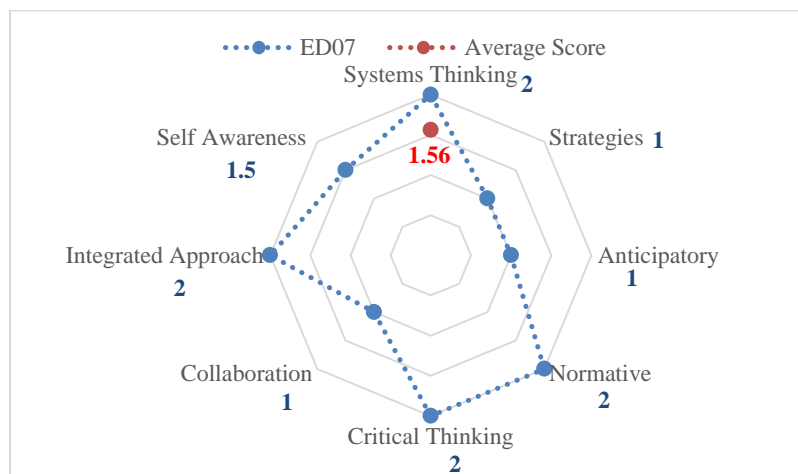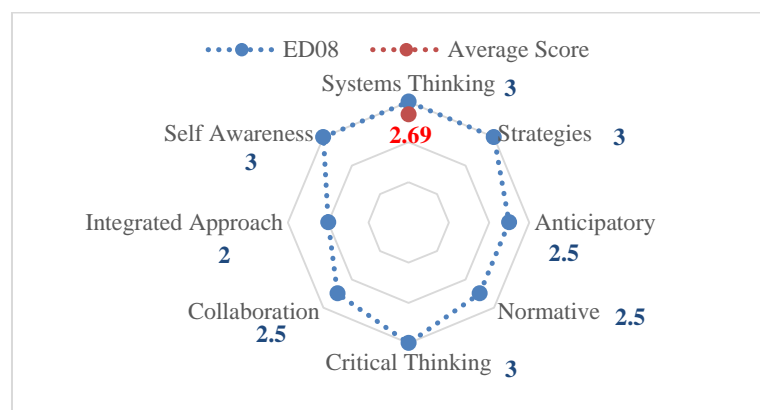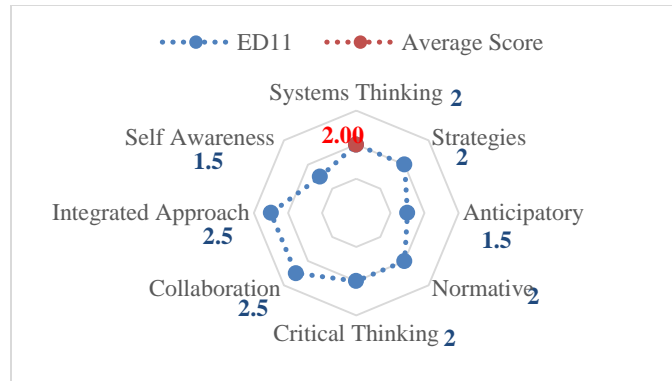
Figure 15 showing the total scores for each of the eight criterion outcomes under the framework for sustainability competencies for syllabus ED11 under College of APS at 300 undergraduate levels

ED11 curriculum as per *Figure 15* scored overall average subject score of *2.00* stating that the syllabus *partially meets* the criterion outcomes of the framework for sustainability competencies. Two of the criterion collaboration and integrated problem solving approach scored 2.5 each while four other criterion systems thinking, strategies, normative and critical thinking scored 2 points each on distinct criterion level respectively. Criterion anticipatory and self-awareness scored the lower of 1.5 each affirming that the criterion outcomes do not meet the competency at the specific level. Criterion anticipatory allows learners and students to gain necessary skills to deal with changes and risks by evaluating multiple and possible futures and creating one's own vision whereas self-awareness criterion provides skills to understand, reflect, evaluate and motivate ones action in the global society (UNESCO, 2017).

5.1.2   Summary Findings

According to the findings and evaluation result, it gives the impression that out of the eleven curriculums evaluated within the area of study for environment and development at undergraduate 300 levels, ten (10) of the curriculum partially meets the criterion outcomes requirements of the framework for sustainability competency while one (1) of the curriculum does not meet the requirements as per the overall average curriculum scores as shown in Figure 15. None of the curriculum fully met the requirements of the criterion outcome under the evaluative framework for sustainability competency. Figure 16 further illustrates the average curriculum scores under

the area of study for environment and development cluster highlighting the highest and the lowest average scores.

However, it is imminent that majority of the outcomes scores came from the relative wordings implying that the overall curriculum covers the standard keywords of these criterion outcomes and sustainability competency but indirect words or synonyms are observable if someone reads the full curriculum outline in detail. On average fifty one percent (51%) of the standard keyword is directly reflected into the environment and development cluster curriculums and forty six percent (46 %) are reflected with indirect words or words that are closely related to the standard keywords or the criterion outcomes. Three percent (3%) showed neither direct nor indirect word relation in the overall curriculum for environment and development cluster.

Figure 17 shows the average subject scores of study area for environment and development studies under APS undergraduate at 300 levels. ED08 curriculum scored the highest average score while ED07 scores the lowest average score.
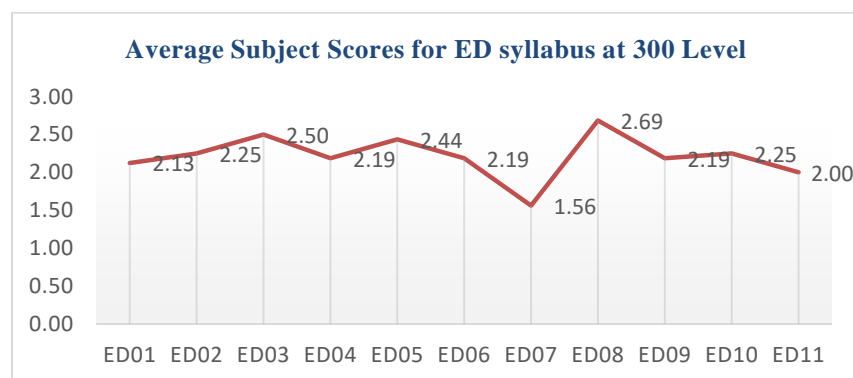
The average score of each of the sustainability competency for study area of environment and development for undergraduate curriculum at 300 levels is shown *Figure 18*. The maximum score

of 0.82 showed that self-awareness competency reflected 82% in the overall curriculum while collaboration scored the lowest of 0.63. The entire sustainability competency scored above average of 0.50 meaning none of the competency scored below 50%. The overall mean score of 0.75 states that 75% of the environment and development curriculums partially covers and meets the requirements of the criterion outcomes of the framework for sustainability competency.

Figure 18 shows the average percentage for each of the sustainability competency for the overall area of study under environment and development for undergraduate curriculum at 300 levels. Self-awareness competency scored the maximum of 0.82 showing that 82% of the curriculums reflect this competency while collaboration scored the lowest of 0.63. Overall mean score was 0.75 stating that 75% of the ED curriculum covers the requirements of the criterion outcomes of the framework for sustainability competency.
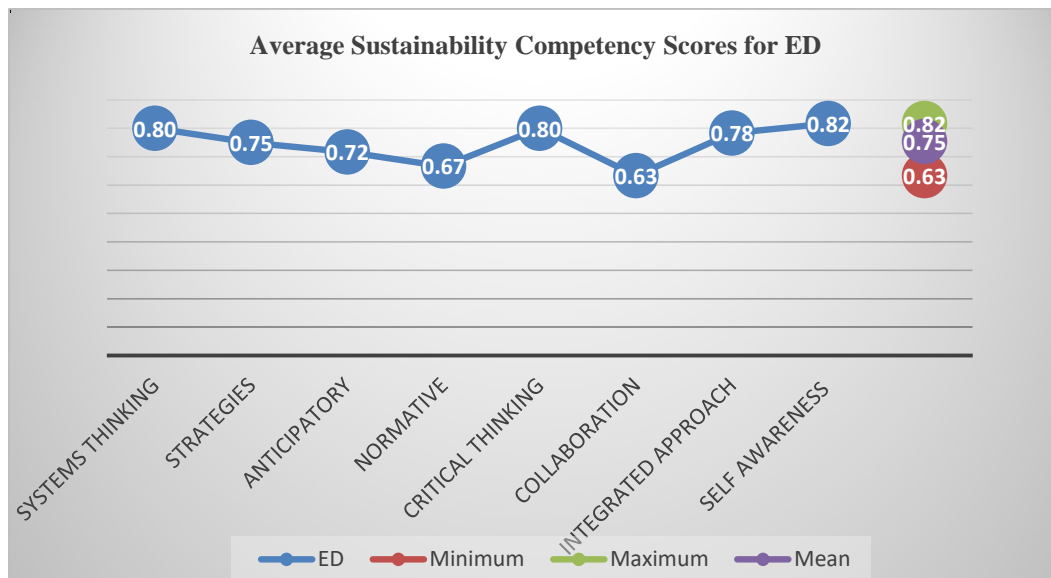
5.2   Study Area II: Culture, Media and Society (CSM)

Table 9 Showing Summary of Sustainability Competency Criterion Outcomes Scores for Culture, Society and Media under College of APS Undergraduate Courses at 300 Levels

Criteria	Outcomes	CSM01	CSM02	CSM03	CSM04	CSM05	CSM06	CSM07	CSM08	CSM09	CSM10
				Area of Study Culture, Media and Society							
Systems Thinking	Outcome 1	1	0.5	0.5	1	0.5	1	0.5	1	1	0.5
	Outcome 2	1	1	0	1	0	0	0.5	0	1	0.5
	Outcome 3	1	1	1	1	0.5	1	1	1	1	1
Total Scores		**3**	**2.5**	**1.5**	**3**	**1**	**2**	**2**	**2**	**3**	**2**
Strategies	Outcome 1	1	1	0	1	1	0	1	0.5	1	0.5
	Outcome 2	1	0.5	0	1	0.5	0.5	1	0	1	0.5
	Outcome 3	0.5	1	0.5	1	1	1	1	1	1	1
Total Scores		**2.5**	**2.5**	**0.5**	**3**	**2.5**	**1.5**	**3**	**1.5**	**3**	**2**
Anticipatory	Outcome 1	0.5	0.5	0.5	1	0.5	0	0.5	1	1	0.5
	Outcome 2	0.5	1	0	0.5	0	0.5	0.5	0.5	1	0.5
	Outcome 3	1	1	0.5	1	0.5	0	1	1	0.5	0.5
Total Scores		**2**	**2.5**	**1**	**2.5**	**1**	**0.5**	**2**	**2.5**	**2.5**	**1.5**
Normative	Outcome 1	0.5	0	1	1	1	0.5	1	1	1	0.5
	Outcome 2	0	0.5	0	0.5	1	0	1	0.5	1	1
	Outcome 3	0.5	0	0.5	0.5	0	1	1	0.5	0.5	0.5
Total Scores		**1**	**0.5**	**1.5**	**2**	**2**	**1.5**	**3**	**2**	**2.5**	**2**
Critical Thinking	Outcome 1	1	0.5	0.5	1	1	0.5	0.5	1	1	0.5
	Outcome 2	1	1	0.5	0.5	1	0	1	0	1	0.5
	Outcome 3	0.5	0	0	1	0.5	1	1	1	1	1
Total Scores		**2.5**	**1.5**	**1**	**2.5**	**2.5**	**1.5**	**2.5**	**2**	**3**	**2**
Collaboration	Outcome 1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1
	Outcome 2	0.5	0.5	0	1	0.5	0.5	1	0.5	0.5	0.5
	Outcome 3	0.5	0.5	0	1	0.5	0.5	1	1	1	1
Total Scores		**1.5**	**1.5**	**0.5**	**2.5**	**1.5**	**1.5**	**2.5**	**2.5**	**2.5**	**2.5**
Integrated Approach	Outcome 1	1	1	0.5	1	1	0.5	1	0.5	1	1
	Outcome 2	1	1	0	1	0.5	1	0.5	0.5	0.5	0.5
	Outcome 3	0.5	0	0	1	1	0.5	1	0.5	0.5	1
Total Scores		**2.5**	**2**	**0.5**	**3**	**2.5**	**2**	**2.5**	**1.5**	**2**	**2.5**
Self Awareness	Outcome 1	0.5	1	0.5	0.5	0	1	1	0.5	1	0.5
	Outcome 2	0.5	1	0.5	1	0.5	0	0.5	0.5	1	0.5
	Outcome 3	0	0	0	0.5	1	1	1	0.5	1	0.5
Total Scores		**1**	**2**	**1**	**2**	**1.5**	**2**	**2.5**	**1.5**	**3**	**1.5**
Total average Scores		**2.00**	**1.88**	**0.94**	**2.56**	**1.81**	**1.56**	**2.50**	**1.94**	**2.69**	**2.00**
Ratio		**0.67**	**0.63**	**0.31**	**0.85**	**0.60**	**0.52**	**0.83**	**0.65**	**0.90**	**0.67**

For the area study of culture, media and society at 300 levels had ten subjects as stated in *Table 8* above. Each of the syllabuses at 300 levels for area of study culture, media and society was evaluated using its course objective and expected learning outcome against the proposed criterion

outcomes for sustainability competencies. While there are eight competencies, each competency has a maximum total score of 3 and minimum score of 1. The figures in 6.2.1 below show the sustainability competency illustrations. The pattern defines for itself how well each of the competencies is reflected in each of the syllabus.

5.2.1 Competence scores for individual subjects

Figure 19 showing total score of each criterion outcomes of the framework for sustainability competencies for CSM01 syllabus under College of APS undergraduate at 300 levels

CSM01 syllabus in *Figure 18* illustrated an overall average subject score of *2.00* showing that the curriculum ***partially meets*** the overall criterion outcomes of the framework for sustainability competencies. Criterion systems thinking scored 3 respectively on individual level criterion stating that the criterion outcomes of the framework for sustainability competency are fully met. However, two criterions normative and self-awareness scored at a lowest of 1 each affirming that the criterion outcomes of each are not met for sustainability competency. Three criterion strategies, critical thinking and integrated problem solving approach scored 2.5 each on individual criterion level while anticipatory scored 2 which shows that these criterions partially meets the outcomes of the respective sustainability competency.

Figure 20 showing total score of each of the criterion outcomes of the framework for sustainability competencies for CSM02 syllabus under College of APS undergraduate at 300 levels

CSM02 syllabus as per *Figure 19* shows that criterion system thinking, strategies and anticipatory scored a total score of 2.5 each affirming that these three criterions partially meets the framework for sustainability competency at specific level. Criterion integrated problem solving approach and self-awareness also partially meets the outcomes of the framework for sustainability competency scoring 2 points on specific level. However, three criterions scored below average showing that these criterion outcomes are not met for the framework for sustainability competency. These criterions include critical thinking, collaboration which scored 1.5 each and normative which scored 0.5. The overall average score for this curriculum stands at *1.88* affirming that the subject *does not meet* the required outcomes of the framework for sustainability competencies.

Figure 21 showing total scores of each criterion outcomes of the framework for sustainability competencies for CSM03 syllabus under College of APS undergraduate at 300 levels

Figure 20 shows CSM03 syllabus having an average overall scored ***0.94*** that affirms that the overall subject ***does not meet*** the outcomes of the framework for sustainability competency. The graph shows that each criterion has 1.5 or less meaning that the outcomes for each criterion are reflected at an insignificant level. Three of the criterions strategies, collaboration and integrated problem solving approach had scored 0.5 while anticipatory, critical thinking and self-awareness scored total of 1 respectively. Criterion systems thinking and normative scored 1.5 each which stood the highest score compared to all the other criterions meaning that none of the criterions scored on above average level for partial compliance.
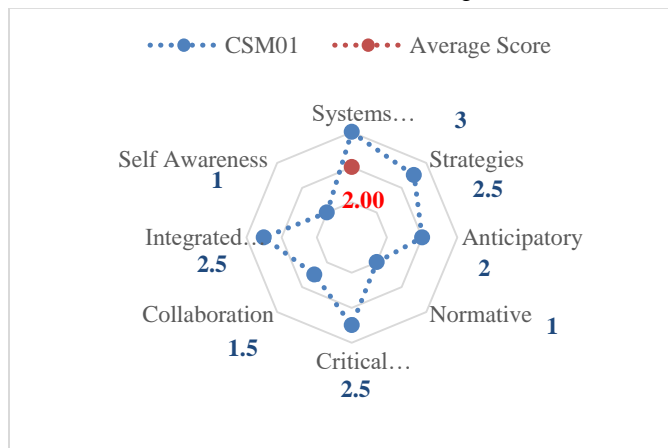

Figure 22 showing total scores of each criterion outcomes of the framework for sustainability competencies for CSM04 syllabus under College of APS undergraduate at 300 levels

In accordance with *Figure 21,* CSM04 curriculum had three of the criterions shows that the respective criterion fully meeting the outcomes of the particular sustainability competency. These included systems thinking, strategies and integrated problem solving approach criterions with total scores of 3 respectively. Three of the other criterions anticipatory, critical thinking and collaboration scored 2.5 respectively while normative and self-awareness criterion scored 2 each respectively affirming that the outcomes of the criterion are partially met. The overall subject score for the curriculum is ***2.56*** stating that it ***partially meets*** the criterion outcomes of the framework for sustainability competencies.

Figure 23 showing total scores for each of the criterion outcomes of the framework for sustainability competencies for CSM05 syllabus under College of APS undergraduate at 300 levels

CSM05 syllabus as per *Figure 22* had highest total criterion score of 2.5 for three criterions strategies, critical thinking and integrated problem solving approach respectively. Criterion normative scored a total of 2 showing the overall four criterions partially meeting the outcomes of each criterion on the framework for sustainability competency. The overall average course scored **1.81** that demonstrates that the subject ***does not meet*** the outcomes of the framework for sustainability competencies. Criterion system thinking and anticipatory scored 1 point each while collaboration and self-awareness scored 1.5 each respectively.
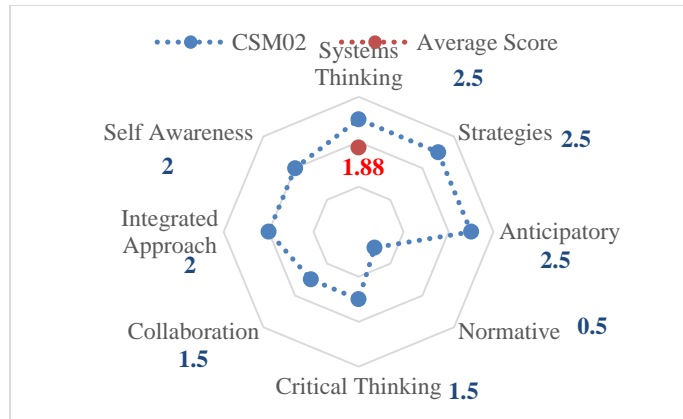

Figure 24 showing total scores for each of the criterion outcomes of the framework for sustainability competencies for CSMO6 syllabus under College of APS undergraduate at 300 levels

In *Figure 23*, CSM06 syllabus shows that three of the criterions systems thinking, integrated problem solving approach and self-awareness partially meets the outcomes for their respective

criterion scoring a total of 2 points respectively. Four other criterions strategies, normative, critical thinking and collaboration scored 1.5 points each while criterion anticipatory scored 0.5 concluding that these criterions does not meet the criterion outcomes of the framework for sustainability competency at specific level. On the overall average the subject scored *1.56* demonstrating that the overall course ***does not meet*** the overall criterion outcomes of the framework for sustainability competency.
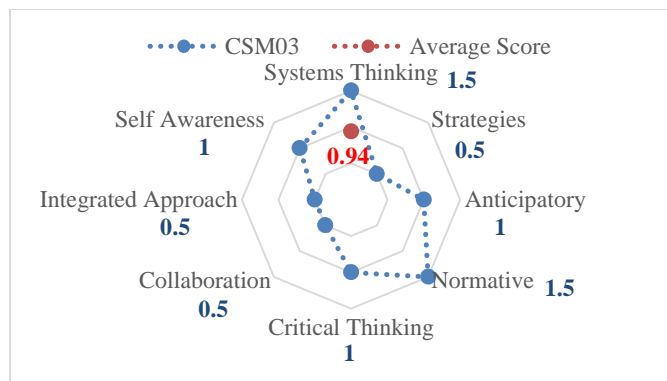

Figure 25 showing total scores for each criterion outcomes of the framework for sustainability competencies for CSM07 syllabus under College of APS undergraduate at 300 levels

CSM07 syllabus as per *Figure 24* scored total of 2.5 respectively for the four criterions critical thinking, collaboration, integrated problem solving approach and self-awareness showing that the criterions partially meets the individual criterion outcomes of the framework of the sustainability competency. Two criterions strategies and normative scored total of 3 points each stating that these criterion outcomes are fully reflected onto the curriculum therefore it full meets the criterion outcomes of the sustainability competency. The overall average score for the subject shows *2.50* confirming that the curriculum ***partially meets*** the outcomes of the framework for the sustainability competencies. Two of the criterions systems thinking and anticipatory also scored total of 2 points each showing that it partially meets the specific criterion outcomes of the framework for sustainability competency.
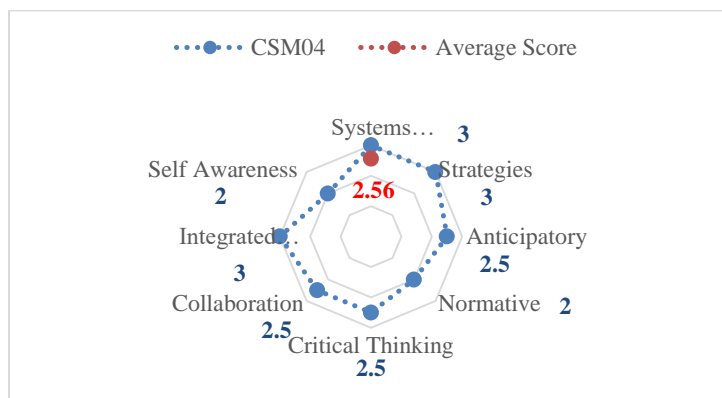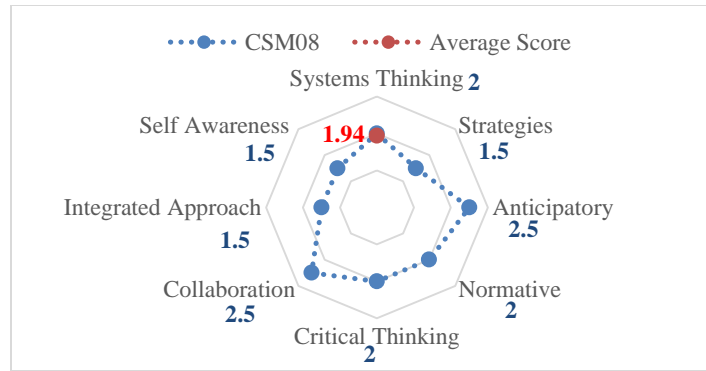
Figure 26 showing total scores for each of the criterion outcomes of the framework for sustainability competencies for syllabus CSM08 under College of APS undergraduate courses at 300 levels

As per Figure 25, CSM08 on overall average scored *1.94* which shows that the subject *does not meet* the criterion outcomes of the framework for sustainability competencies. The highest on the individual criterion scored 2.5 for two criterions anticipatory and collaboration stating that these criterions partially meet the outcomes for sustainability competency. Criterion systems thinking, normative and critical thinking also partially meets the outcomes of the framework for sustainability competency with total scores of 2 points each respectively. Three other criterions strategies, integrated problem solving approach and self-awareness scored lowest of 1.5 each on individual criterion level showing that the outcomes of these criterions contribute insignificantly towards the outcomes for framework for sustainability competency.

The following two curriculum are similar to case study I ED08 which represent CSM09 and ED11 which represents CSM10 as the curriculum outline and design is same for area of study for environment and development used in case study I and area of study for culture, society and media in case study II. Therefore the analysis is repeated for CSM09 and CSM10.
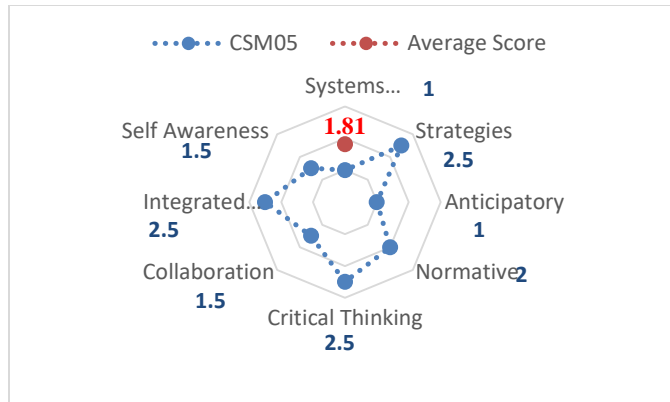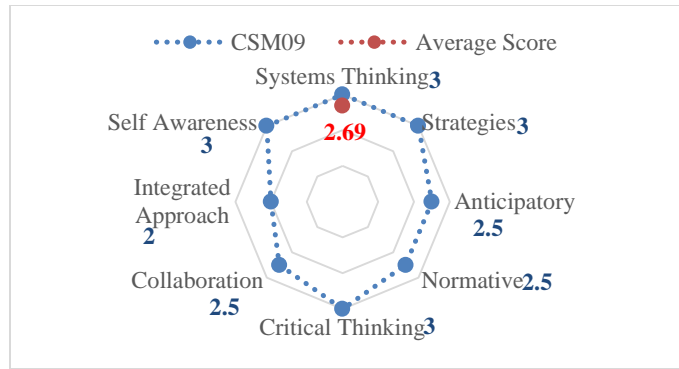
Figure 27 showing total scores for each of the criterion outcomes of framework for sustainability competencies for syllabus CSM09 under College of APS for undergraduate courses at 300 levels

Figure 26 shows CSM09 syllabus demonstrating one of the highest average scores for the overall criterion outcomes in the environment and development department scoring ***2.69***. However, as per the overall evaluation result the subject ***partially meets*** the requirement of the framework for sustainability competency. Four of the criterion scored an overall 3 points demonstrating that those criterions outcomes fully meet the competency at individual level. Criterion 7 integrated problem solving approach requires restructuring to ensure that the overall outcomes continue to be well reflected. Integrated problem solving criterion serves as the primary capability for the overall sustainability competency that encompasses the sustainability issues and presents different types and categories of problem solving frameworks while promoting sustainable development (UNESCO, 2017). Three other criterions overall scored 2.5 each which recommends for redesigning to capture the essence of the each criterion outcomes.
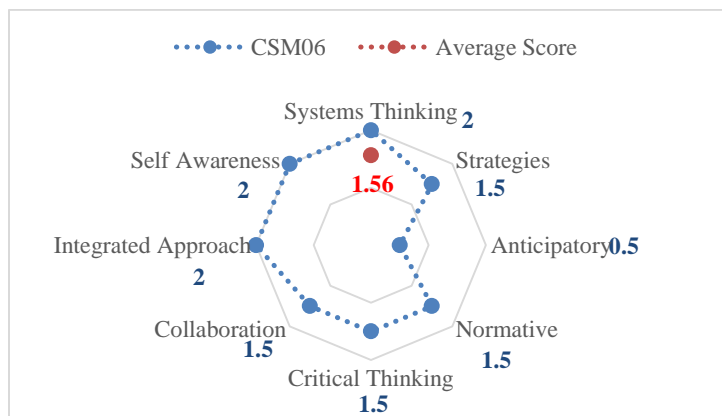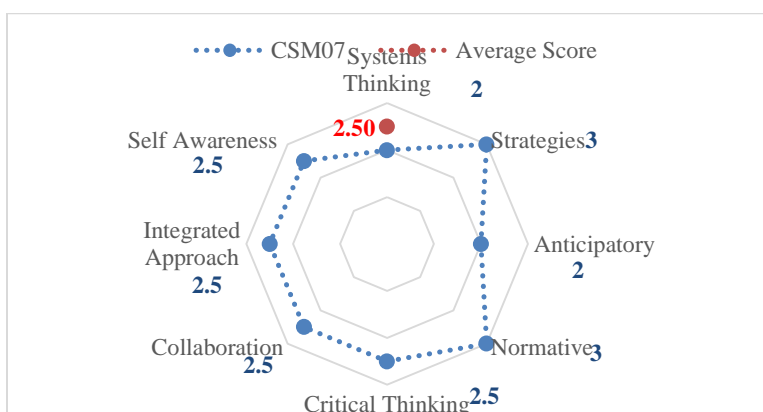
Figure 28 showing total scores for each of the criterion outcomes of framework for sustainability competencies for syllabus CSM10 under College of APS for undergraduate courses at 300 levels

CSM10 curriculum as per *Figure 27* scored overall average subject score of *2.00* stating that the syllabus ***partially meets*** the criterion outcomes of the framework for sustainability competencies. Two of the criterion collaboration and integrated problem solving approach scored 2.5 each while four other criterion systems thinking, strategies, normative and critical thinking scored 2 points each on distinct criterion level respectively. Criterion anticipatory and self-awareness scored the lower of 1.5 each affirming that the criterion outcomes do not meet the competency at the specific level. Criterion anticipatory allows learners and students to gain necessary skills to deal with changes and risks by evaluating multiple and possible futures and creating one's own vision whereas self-awareness criterion provides skills to understand, reflect, evaluate and motivate ones action in the global society (UNESCO, 2017).

5.2.2 Summary Findings

As per the findings and result analysis, the culture, society and media cluster at undergraduate 300 level shows that out of the ten (10) curriculum, five (5) of the curriculum partially meets the criterion outcomes requirements of the framework for sustainability competency while the other five (5) curriculum does not meet the requirements as per the overall average curriculum scores as shown in Figure 28. None of the curriculum fully met the requirements of the

criterion outcome under the evaluative framework for sustainability competency for the area study of culture, society and media. Figure 29 further demonstrates the average subject scores under the area of study for culture, society and media cluster stressing the average scores.

Figure 29 shows the summary findings of the overall curriculum. Five curriculums out of the ten do not meet the requirements of the framework for sustainability competency while other five curriculums partially meet the requirement.
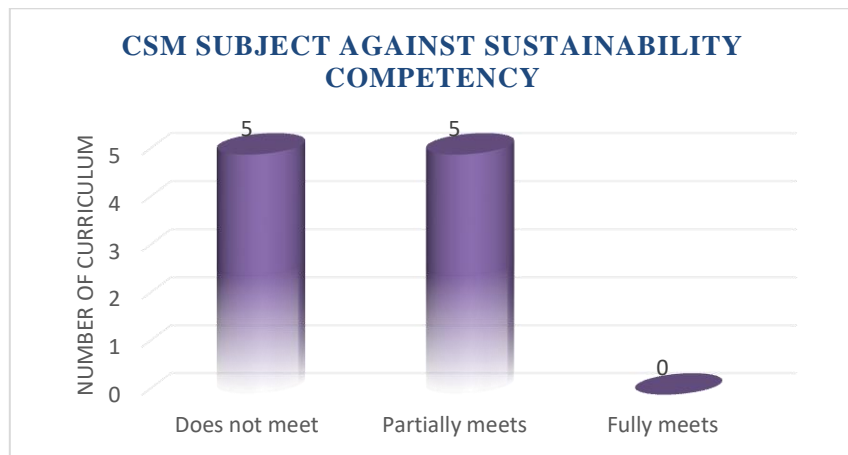
Figure 30 shows the average curriculum scores for study area of culture, society and media undergraduate curriculums at 300 levels. CSM09 curriculum on average scored the highest, however the curriculum is same as ED08. The next highest score of CSM04 of 2.56 is considered highest and lowest score of 0.94 scored under CSM03.
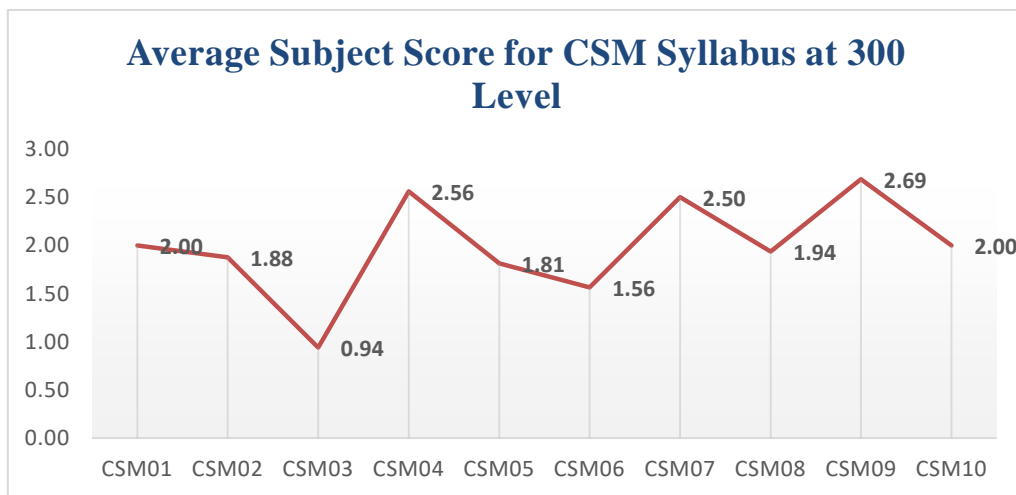
Almost half of the outcomes scores were derived from the relative wordings implying that the overall curriculum covers the standard keywords of these criterion outcomes and sustainability

competency but indirect words or synonyms are observable if someone reads the full curriculum outline in detail. On average forty nine (49%) of the standard keyword is directly reflected into the culture, society and media cluster curriculums and forty one percent (41 %) are reflected with indirect words or words that are closely related to the standard keywords or the criterion outcomes. Ten percent (10%) showed neither direct nor indirect word relation in the overall curriculum for culture, society and media cluster.

Figure 31 shows the average sustainability competency scores for study area of culture, society and media for undergraduate curriculum at 300 levels. The CSM curriculum highest score of 0.73 for sustainability competency systems thinking and strategies while anticipatory and self-awareness scored the lowest of 0.60. The average mean score for the overall sustainability competency score for curriculum CSM was 0.66 depicting that 66% of the curriculum meets the requirement of the criterion outcomes of the framework for sustainability competency.

The average score of each of the sustainability competency for study area of culture, society and media for undergraduate curriculum at 300 levels is shown *Figure 27*. The maximum score of 0.73 showed that systems thinking and strategies competency reflected 73% each in the overall curriculum while anticipatory and self-awareness scored the lowest of 0.60. The entire sustainability competency scored above average of 0.50 meaning none of the competency scored below 50%. The overall mean score of 0.66 states that 66% of the culture,

society and media curriculums covers and meets the requirements of the criterion outcomes of the framework for sustainability competency.

5.3   Comparison of the Two Cases

By using the designed evaluative framework for sustainability competencies, the results determine that any learner undertaking any of the ten courses in the area of study for environment and development consumes a reasonable representative of the competency outcomes. The evaluation results concluded that the ten subjects out of the eleven evaluated meet partial compliance of the criterion outcomes and keywords. Thus the necessary competency outcomes and standard keywords that are required for learners to transform their own behavior and up skill themselves are partially reflected in the syllabus of the ten subjects as shown in table 10 below.

Table 10 shows the overall total scores and average competency scores for each of the 300 level subjects under ED. The average scores for each of the competencies are listed on the last column. The average curriculum scores are shown in the last row with the highest of 2.69 for ED08 and lowest of 1.56 for ED07.

	ED01	ED02	ED03	ED04	ED05	ED06	ED07	ED08	ED09	ED10	ED11	Av
Systems Thinking	2.5	2.5	2.5	3	2	2.5	2	3	2	2	2	2.36
Strategies	2.5	2	2.5	2	2.5	2.5	1	3	2	2.5	2	2.23
Anticipatory	2	1	3	2.5	2.5	2	1	2.5	2.5	2.5	1.5	2.09
Normative	1.5	2.5	2	1	2	2.5	2	2.5	1.5	2.5	2	2.00
Critical Thinking	1.5	2.5	2.5	2.5	3	2.5	2	3	2.5	2	2	2.36
Collaboration	2	2.5	1.5	1.5	2	1.5	1	2.5	2	2.5	2.5	1.95
Integrated Approach	2.5	2	3	2.5	2.5	2	2	2	2.5	2.5	2.5	2.36
Self Awareness	2.5	3	3	2.5	3	2	1.5	3	2.5	1.5	1.5	2.36
Av Curriculum Scores	2.13	2.25	2.50	2.19	2.44	2.19	1.56	2.69	2.19	2.25	2.00	

The green coloured represent full competency score as shown in the above table. This means that those competencies are fully represented into the syllabus on individual subject level.

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Amber represented that the competencies are partially reflected while red coloured represented that the competencies are underscored and not well represented. Competency collaboration scored the lowest and did not meet the average passing score. If a learner selects subjects ED03, ED08, ED09 and ED10, it can be said that a substantial level of competencies will be taught. If a learner elects ED07, he or she will lack on three major competencies such as strategies, anticipatory and collaboration and may only partially obtain other competencies.

To ensure that the courses or subjects fully meet the requirements for the evaluative framework of sustainability competencies, the syllabus learning objectives and expected learning outcomes needs to be redesigned. The curriculum needs to *clearly* reflect the principle of each of the criterion and its outcomes and further define or stress on how the evaluation of learning outcomes would be measured for each objectives.

Table 11 shows the overall total scores and average competency scores for each of the 300 level subjects under CSM. The average scores for each of the competencies are listed on the last column. The average curriculum scores are shown in the last row with the highest of 2.69 for CSM09 and lowest of 0.94 for CSM03.

	CSM01	CSM02	CSM03	CSM04	CSM05	CSM06	CSM07	CSM08	CSM09	CSM10	Av Comp
Systems Thinking	3	2.5	1.5	3	1	2	2	2	3	2	2.20
Strategies	2.5	2.5	0.5	3	2.5	1.5	3	1.5	3	2	2.20
Anticipatory	2	2.5	1	2.5	1	0.5	2	2.5	2.5	1.5	1.80
Normative	1	0.5	1.5	2	2	1.5	3	2	2.5	2	1.80
Critical Thinking	2.5	1.5	1	2.5	2.5	1.5	2.5	2	3	2	2.10
Collaboration	1.5	1.5	0.5	2.5	1.5	1.5	2.5	2.5	2.5	2.5	1.90
Integrated Approach	2.5	2	0.5	3	2.5	2	2.5	1.5	2	2.5	2.10
Self Awareness	1	2	1	2	1.5	2	2.5	1.5	3	1.5	1.80
Av Curriculum Scores	2.00	1.88	0.94	2.56	1.81	1.56	2.50	1.94	2.69	2.00	

For the area study in culture, media and society, the evaluation results determines that any learner undertaking the five subjects with above 2.00 average score from this cluster will only meet the partial requirements of the sustainability competency. Out of the ten subjects evaluated, only five subjects meets the partial compliance of sustainability competencies outcomes while the other five does not meet the requirements as shown in table 11.

If the learner choses to take five of the curriculum that partially meets the requirement of the framework for sustainability competencies than it is expected that they will gain the necessary knowledge, skills and attributes pertaining to sustainable development and education for sustainable development. Any learner who picks CSM04, CSM07 and CSM09 during his or her studies at 300 levels specializing in this area of studies is assumed to be taught those competencies. For CSM03, it may have the contents of the subject area but lacks six competencies in the written syllabus that would teach the learners on the specific skills and abilities. To ensure that the program and subjects fully meet the requirement for the evaluative framework of sustainability competencies, the syllabus learning objectives and expected learning outcomes needs to be redesigned to reflect the essence of each of the criterion and its outcomes.

The above results illustrate that area of study environment and development had a better representation of the key component of sustainability competencies compared to culture, society and media. Both had same high score of 2.69; however it is the representative of the same curriculum for both areas of studies, ED08 and CSM09. Two syllabuses are similar to case study I ED08 which represents CSM09 and ED11 which represents CSM10. Therefore next highest scores are used for the comparison that is culture, society and media with 2.56 and environment and development had 2.50. The lowest scores ranged from 1.56 for

environment and development and 0.94 for culture, society and media. Overall environment and development had ten out of eleven subjects meeting the requirements of the criterion outcomes whereas culture, society and media had only five out of ten subjects meeting the requirements.

Figure 32 shows the average sustainability competency scores for both ED & CSM curriculum. ED had a mean score of 0.75 while CSM had mean score of 0.66. Sustainability competency collaboration and strategies had similar average scores for both curriculums.
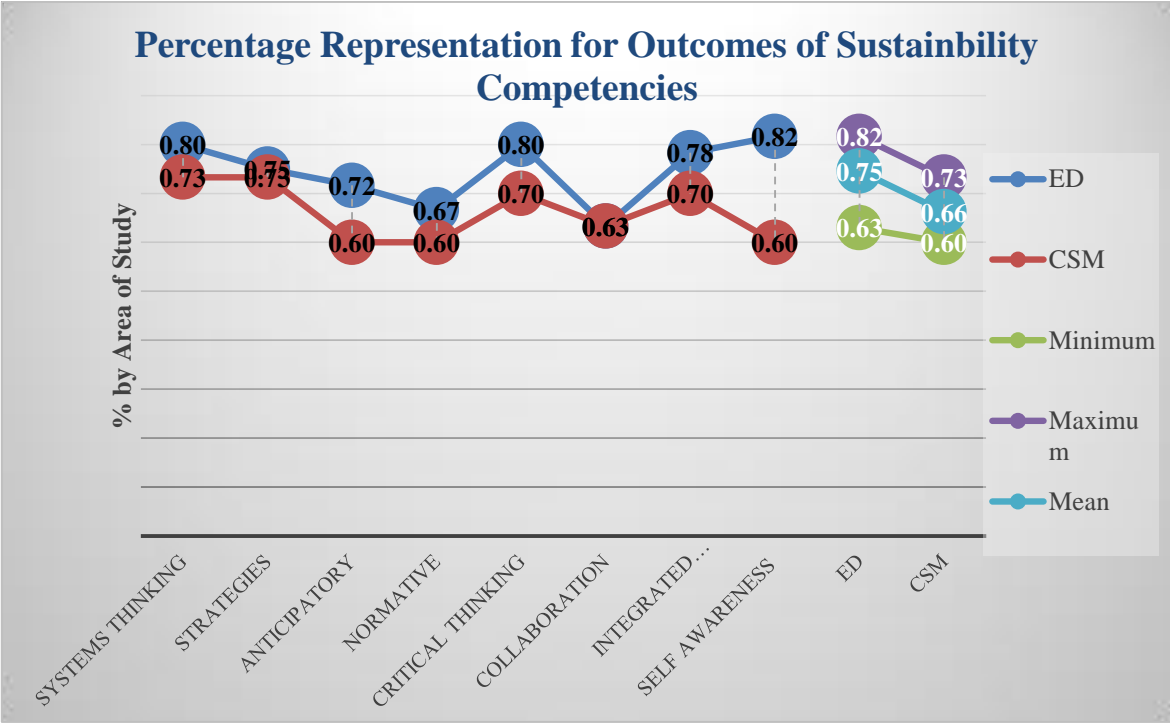
This shows that overall if a learners or student takes those ten curriculums from environment and development and five curriculums from culture, society and media they will be able to obtain a reasonable amount of knowledge, skills and attributes of the sustainability competency and sustainable development. The area study for environment and development syllabus covers the overall criterion outcomes requirements of the sustainability competency by 75% while culture, society and media covers by 66% as shown in the figure 31 above. Therefore it can be concluded that the study area of environment and development and

culture, society and media partially meets the requirements of sustainability competency and

education for sustainable development.

6 DISCUSSION AND RECOMMENDATIONS

Chapter 7 furthermore discusses on the case study used to show how the proposed EFSC was made as an effective methodology to evaluate the key competencies of sustainability. It also demonstrates by use of the case studies on what kind of results and recommendations can be obtained. The major finding during designing and implementation was that the ESFC can be used to successfully evaluate the individual syllabus as well as the curriculum of the study area as a whole. The process of using syllabus to test the EFSC framework proved to be effective in this case. The research further contributes by indicating how the criterion outcomes of the sustainability competencies can be positioned while designing or redesigning the expected learner outcomes for the subjects or courses. The latter section of this chapter discusses about research contribution, recommendations and limitations.

6.1 Effectiveness of the Evaluative Framework for Sustainability Competencies

The purpose of designing and proposing the EFSC framework for sustainability competencies was to judge whether the existing curriculum and or syllabus already demonstrates a level of sustainability competencies. While this was aligned to improve the quality and relevance of education through the need for improving or re-orienting curriculum, firstly, it is essential to find out to what level the current contents of curriculum covers these competencies. In the way of improving curriculums, its quality and relevance; UNESCO proposed key components of sustainability competencies that were used as a guideline to create a conceptual framework. The guideline basically indicates the types of competencies that need to be reflected in the curriculum but does not recommend how the existing curriculum can be evaluated. Consequently, this research used the conceptual framework and key components of sustainability competencies from UNESCO (UNESCO, 2017). Therefore, the indicators for

inclusion became indicators for evaluation. Each competency was appropriately unpacked into three criterion outcomes and standard keywords. The framework can also be used in two ways. Depending on how well and clearly the curriculum is written, the competency judgments can be made using the criterion outcomes. If the curriculum or syllabus is not clear or well written than the standard keywords can be used to demonstrate the sustainability competencies to conclude. The process is shown in the figure below. The black arrows indicate the two process of evaluating using the EFSC framework.
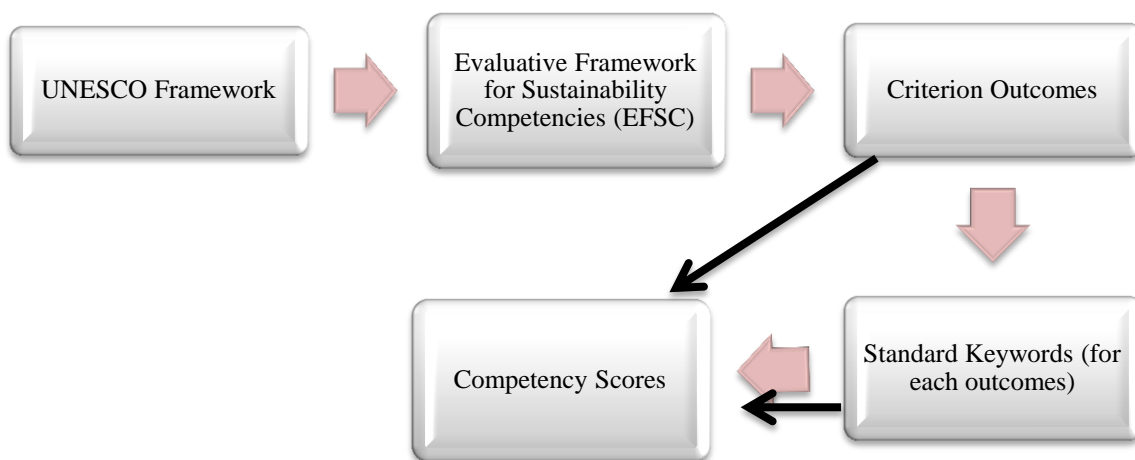
Figure 33 shows the two ways to use the evaluative framework to reach the conclusion (Source; Author)

To test its effectiveness, the criterion outcomes with standard keywords were used to evaluate the existing syllabus as shown previously in the case study. The overall framework is based on the curriculum, its learning objectives and expected learner outcomes, however, in this case study, syllabus was used to test the EFSC framework. In the case study university, curriculum policy for College for Asia Pacific Studies is under reform, therefore, it is not feasible to use the curriculum that will be preferably replaced. The major finding during designing and implementation was that the ESFC can be used to successfully evaluate the individual syllabus

as well as the curriculum of the study area as a whole. The process of using syllabus to test the EFSC proved to be effective. Syllabuses are well described; written document that actually tells what is expected to happen in the classroom. It has clear learning objectives, expected learner outcomes and its assessment criteria.

The effectiveness is shown as to how the criterion outcomes and standard keywords can be linked to evaluate the overall syllabus and not just concentrate on objectives and outcomes. It is also noted that the EFSC can serve dual purpose. Firstly, it can be used to evaluate existing curriculum and or syllabus to find out the level of sustainability competencies demonstrated. Secondly, it can form a framework for designing and writing a new curriculum and syllabus. The intended criterion outcomes from the EFSC in this research can act as indicators for inclusion of sustainability competency into the curriculums and syllabus.

The standard keywords and outcomes of the EFSC can also act as new indicators for the overall development of educational goals and used efficiently as a value added approach towards sustainability of universities. A mutual strengthening opportunity is suggested in order to make the university research towards practices of sustainable development and sustainability science research for sustainable development more viable (Waas, Verbruggen, & Wright, 2009). This would also include the review of educational and curriculum frameworks including the physical delivery of programs and assessment of learner accomplishments.

6.2   Further Deliberation on the Case Study Result

The findings and result analysis of the primary data supports the view of this research in authenticating the conceptual framework. With the criterion outcomes and keywords corresponding to sustainability competencies, measuring the level of competency existence

and evaluating the overall syllabus provides a comprehensive approach. A comprehensive approach meaning that by way of using this framework in the existing syllabus, it gives a better view of what competencies is already being reflected and what needs to be reflected. It performs a gap analysis on the syllabus itself in identifying the missing level of competencies.

The results of the case study are not all inclusive result for the overall area of studies. The two area of study at 300 levels "capstones majors" from College of Asia Pacific Studies used to test the conceptual framework, demonstrated that to a certain level the existing syllabus reflects the key competencies of sustainability. The area study of environment and development syllabus showed a greater exposure of the sustainability competencies compared to culture, media and society at 300 levels. In order to find out if the overall area of study for environment and development and culture, media and society covers the criterion outcomes of the evaluative framework for sustainability competencies, all syllabus from 100 to 400 levels needs to be evaluated. Depending on how the diploma policy and educational objectives are outlined in any university setting, there are possibilities that each or a number of competencies are met at different levels of studies. In other words all the eight key components of sustainability competencies may be or can be obtained throughout the progressive learning from 100 to 400 levels.

How the syllabus is written and what are some of the aims of the syllabus is also dependent on the universities educational goal, diploma policy and curriculum policy. The design and development of curriculum and diploma policy are based upon the universities educational objectives, philosophy and human resource development goals. The overall diploma policy and educational objectives for College of Asia Pacific clearly states its objectives and outcomes that shall be reflected in the syllabus for all area of studies. As previously noted in

the literature review, the HEIs in Japan have the privilege and freedom to design their own programs and curriculums. MEXT provides reference guidelines on graduate competencies as a requirement for institutional guidance. The reference guidelines covers the key domains such as knowledge, skills, attitude and learning outcomes description for undergraduates programs for institutional guidance (NIAD-QE, 2017). The human resource development goals for college of Asia Pacific Studies in APU requires students to develop similar key domains such *communication skills, language proficiency* and *understand diverse range of problems* and *ability to solve problems* in the Asia Pacific region while enhancing environment, global society, international relations and development (Ritsumeikan Asia Pacific University, 2017). This means that the university does not only focuses on specific skills but supports learners gain comprehensive judgmental skills and broader aspect of education to foster rich human resources. This shows that sustainability competency *systems thinking, collaboration and integrated problem solving approach* are directly linked to the current human resource development goals of the college of Asia Pacific Studies[6] [APU, 2016].

ESD purpose is to make the educational goals and curriculum right, of quality, effective to meet the requirements and challenges of the 21st century. The ESD gives directions and provides general competencies to enhance human resources development and graduates that meet the requirements to challenge sustainable development issues. The educational objectives for college of Asia Pacific Studies evidently signify the requirement of ESD and sustainable development covering the aspects of environment, social, culture and economics (UNESCO, 2007). It also necessitates that the inclusion of vital skills and knowledge of

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[6] http://en.apu.ac.jp/home/about/content6/

environment development, international relations, tourism and culture society and media shall be made understood to the learners. These vital skills need to be well reflected in the development of syllabus for subjects under the above area of studies.

As mentioned earlier, the design and development of syllabus should be aligned to the educational objectives, diploma and curriculum policies. For the case study programs, the professors or teachers in charge for the subject writes the syllabus. This process is then quality assured by the respective Dean of the colleges. The two areas of studies used as case study examples showed that it partially meets the key components of sustainability competencies. Based on the overall average results for study area culture, media and society demonstrated 66% of the criterion outcomes of the EFSC. While environment and development area of study demonstrated at 75% of the competency outcomes of EFSC. This reveals that the syllabus still needs improvement to reflect other and further enhance the existing sustainability competencies. The diploma and curriculum policy should include a broader all-inclusive list of expected learner outcomes pertaining to general or sustainability competencies to will help completely transform the learner. The above two policies are central documents and acts as a guideline for teachers to design and develop the syllabus and reflect the overall educational goals of the university and the program.

Additionally, the well-defined curriculum policy of APU sets three important objectives as discussed in chapter 3. These outlines, interactive and collaborative learning, providing skills, knowledge, abilities to critically and systematically assess, analyze views at local and international levels, be able to assimilate innovations and changes and enhance leadership skills [APU, 2016]. In other words these competencies are also reflected on the criterion outcomes of systems thinking, critical thinking, and integrated problem solving approach,

collaboration and self-awareness competencies as per the description in table 3 that outlines the framework. However, the college of Asia Pacific Studies shall consider inclusion of the other key competencies of sustainability such as strategies, anticipatory and normative for a better recognition of their learner outcomes. Thus enhancing the expected learning outcomes where ED curriculum policy states that the learners should be "able to examine the sustainable development policies in view of systems and law of each country and region" and CSM aim learners to "gain global perspective and ability to view the region in different angles"[7] [APU, 2016].

This evaluative framework for sustainability competencies assures the quality and relevance of the curriculum, syllabus and teaching. In order to design syllabus, curriculum objectives and expected learner outcomes needs to be clearly written with all-inclusive knowledge, skills and abilities that the university aims to produce. As an example, the framework identified what sustainability competencies are present and to which level it is represented in the syllabus. The results can be useful for academia to re-look at their syllabus and curriculum outline and fulfill the gaps identified. The framework can be both applied during new curriculum planning and during re-designing or re-orienting of the syllabus. A well written curriculum will provide support towards a standardized syllabus that is of quality and relevance. The curriculum and syllabus needs to be reviewed based on the changes in the universities vision and educational goals. It can be either periodically reviewed, reformed or reviewed based on the need or when there is change in direction of the national educational goals. APU curriculum reform is not periodically but rather flexible based on the needs (the trend was identified from the written response of the survey questionnaire as listed in the

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[7] http://en.apu.ac.jp/home/about/informationDisclosure/curriculum_policy-E.pdf

appendix 9.5). This is a positive pathway towards enhancement of teaching and learning as this shows that the university takes into account the need to change for the global society. Thus the APU tries to maintain the relevance of their programs that can be well-matched internationally. However, to personally transform the learners with transversal skills, APU should consider including the all-inclusive skills by facilitating the key components of sustainability competencies.

6.3 Unpacking and Positioning of Sustainability Competencies into the Curriculum and or Syllabus

Based on the research methodology and testing the EFSC framework efficiency and its outcomes, the section below contributes on how a policy maker or curriculum developer or syllabus writers can re-align or re-design the course or curriculum objectives and learner outcomes to reflect the key competencies of sustainability using the UNESCO defined framework (UNESCO, 2017).

In order to model *systems thinking*, the design of the curriculum and syllabus shall allow learners to recognize and understand different kinds of relationships whereby the teaching allows learners to analyze the different frameworks and methodologies used in and within the system. This will also allow learners to think at different scales whether it situates at society level, local and or international level and how one can deal with such situations within the different fields or scale. Based on the curriculum/course organization, while it provides different systems, the process of system thinking competence should allow the learners to be able to make decisions that are crucial to sustainability. This should be taught in a concept that allows learners on how to deal with uncertainties (UNESCO, 2017).

The proposed *expected learning outcomes* to reflect *systems thinking* shall include: "The learners should be able to **interpret the relationships** between different systems, principles and frameworks. The learners should be **able to analyze and evaluate and construct arguments** using the complex systems. The learners should be **able demonstrate** their skills using different systems, scales and at the same time **display abilities** to deal with uncertainties" ~ *Author*.

In order to model ***anticipatory,*** the curriculum shall be designed in a way that allows learners to be able to create visions for the future or probable future and prepare learners to be able to make proactive, preventive and protective solutions. In a similar fashion, it should provide learners the capability, knowledge, skills to understand, assess and evaluate actions of different consequences and impart effectively on how to adapt to the changes and deal with risks (UNESCO, 2017).

The proposed *expected learning outcomes* to reflect *anticipatory* shall include: "The learners should be **able to design** visions for future and **demonstrate proactive and innovative solutions**. The learners should be **able to demonstrate their assessment and evaluation skills** for different kinds of consequences and risks concerning sustainability development pertaining to environment, social and economy" ~ *Author*.

The ***normative*** competency in the curriculum shall ideally capture certain behaviour or norm and values that reflects one's action whether it is at local or international community. The competency uses the best practices approaches for negotiating sustainable values, their goals, principles and targets. The curriculum shall provide knowledge, skills and abilities for learners on ambiguity and the possible paradoxes. Based on the resources used, the curriculum shall

demonstrate attributes and values on different kinds of society/community by making learners understand their principles, targets, trade-off values and conflict of interests within resources, individually and as a community (UNESCO, 2017).

The proposed *expected learning outcomes* to reflect *normative* competency shall include: "The learners should be **able to reflect their own behaviour** towards ones action and the community. The learners should gain **abilities to identify the best practices to negotiate sustainable values**. The learners shall **demonstrate trading skills, dealing with conflicts** of interest for resource management" ~ *Author*.

Policy development is one of the key aspects towards implementing any strategies. To model *strategic* competency the curriculum allows learners on how to plan, develop, implement and monitor. These include ideas and actions that is innovative or which will assist further advancement of sustainability both at local and global level. Some systems may not work for a community while it may work well for another community elsewhere. Therefore, based on the resources and the demographics, the curriculum should intend to reflect innovation suitable to both develop or developing countries. Strategic planning is planned and developed collectively therefore the curriculum should also reflect the effects of collaboration, group works and partnerships skills (UNESCO, 2017).

The proposed *expected learning outcomes* to reflect *strategic* competency shall include: "The learners should be **able to identify the needs for policy development** and **demonstrate their skills on planning, developing and implementing actions**. The learners should be able to enhance and **demonstrate their communication and partnership skills**" ~ *Author*.

To model ***collaboration***, the curriculum design should intent to consider case studies or collaboration, discussion and teamwork session where group work is highly involved. This will allow the learners to develop abilities to understand each other's decision, be able to identify sensitivity of issues and realize actions of others. It should basically facilitate collaboration and cooperation to allow learners to develop skills on how to resolve conflicts in groups and develop problem solving skills (UNESCO, 2017).

The proposed *expected learning outcomes* for *collaboration* competency shall include: "The learners should be **able to develop empathy skills to understand each other's** decision and be **able to demonstrate** these skills through facilitating collaboration and cooperation among projects. The learners should be **able to demonstrate problem solving skills** and conflict resolution" ~ *Author*.

In having ***critical thinking*** competency in the curriculum and syllabus design, it teaches and contains provisions for learners to be able to question practices, opinions and norms while reflecting their own values. The curriculum with critical thinking teaches how to take actions and value perceptions and to allow learners to develop the required knowledge, skills and attitudes. This contributes to learner transformation and position them to better address sustainability based on the seriousness and the potential risks (UNESCO, 2017).

The proposed *expected learning outcomes* to reflect *critical thinking* competency shall comprise: "The learners should be **able to question** certain practices, opinions and norms and **reflect their own values**. The learners should be **able to demonstrate critical thinking and innovative skills** on potential risks to address sustainability issues" ~ *Author*

In order to model *self-awareness* into the curriculum or syllabus, the design shall contain and display teaching abilities that helps motivate the learners and to reflect their own role in the local society or global community. It should weigh the prior knowledge of learners and the expected outcome at the end of the course (UNESCO, 2017).

The proposed *expected learning outcomes* to reflect *self-awareness* competency shall include: "The learners should be **able to reflect and demonstrate** their own personality and feelings towards the course in order to be responsible citizens. The learners should be **able to outline the differences** between prior and new knowledge and be able to share these within their network" ~ *Author*.

The ***integrated problem solving*** competency covers the summary version of an overall sustainability competency. The curriculum and syllabus design intends to outline the knowledge transferring skills to facilitate finding equitable, combined, viable, inclusive and unified solutions to difficult issues. These solutions or the context should allow learners to promote sustainable development by using complex sustainability problems and integrate all the other seven competencies (UNESCO, 2017).

The proposed *expected learning outcomes* to reflect *integrated problem solving* competency shall include: "The learners should be **able to demonstrate capabilities** into developing frameworks and unified all-inclusive feasible solutions to resolve complex sustainability issues by integrating all the other seven key competencies of sustainability" ~ *Author*.

The above proposed expected learning outcomes are unpacked from the EFSC framework. This suggests that the EFSC can be also used as guidance. It can be used as guidance to design or re-design and develop curriculum for courses and even syllabus that reflects the key

competencies of sustainability. A quality and a curriculum that is relevant will well represent the learning objectives and outcomes with the knowledge, skills, values and abilities. In order to lead a peaceful life and productive work, a quality curriculum and syllabus primary aim is to enable learners to understand by obtaining the knowledge and acquire to develop their skills, attitudes and values. These should be done in all-inclusive and in a fair manner to associate the competencies and capabilities that allows transformation as individual to lead a peaceful live in a society (Stabback, 2016). Therefore, this research further contributes towards the usage of the evaluative framework in re-designing or inclusion of the expected competencies by way of proposing it in the expected learning outcomes.

The above outline in this research expresses to the reader on how the competencies can be unpacked and positioned during curriculum planning and designing or even in this case in the writing of syllabus. However, the biggest challenge still remains, and that is, how to measure the outputs of these competencies. "*It is important to consider how the success of the curriculum will be judged first before curriculum implementation is approaced"Pg.40* (Stabback, 2016). How these competencies intends to be included in the subjects taught and how the output or the outcomes of the competencies will be measured needs further elaboration. This may call for separate research which will look into the next two steps towards teaching and learning in other words the implementation through teaching and assessment via learning. Precisely, the significant question is how do you measure the student learning outcomes using the key competencies of sustainability? Can this evaluative framework for sustainability competencies be also used in such a way that develops a methodology which will allow the learning outcomes to be measured?

6.4 Research Recommendations

This sub chapter provides recommendations, research contribution and limitations.

While developing a curriculum one needs to consider many aspects regarding its purpose, relevancy, inclusiveness, flexibility and whether its learner centered. The curriculum design should be consistent across all the stages including college, division or subject levels. It is prominent that the use of curriculum may vary between countries. HEIs and learners in most countries may consider referring to curriculum design and outputs in deciding their educational pathways. Most HEIs and countries are using the ESD and SDG 4 or Education 2030 guidelines to reform their education system for better local and international recognition and student mobility as presented earlier in the literature review. It is evident that the sustainability competencies will continue to be part of the higher education system as this is the place where the learners step out to the market as quality graduates. Quality graduates in this sense are those that are able to attain the essential general competencies and have emotionally transformed themselves.

The EFSC framework proposes skills sets that supplements learners to be personally transformed. How this can be included in the curriculum and syllabus has been discussed in sub-chapter 6.3 on unpacking and positioning. However, further in depth consultation and collaboration with relevant stakeholders is required to make it operational at University level. These include consultation with curriculum and ESD experts, policy makers, HEIs and stakeholders are required to review this framework. It is implicit that any curriculum, program and syllabus do not limit knowledge of only one system or structure. The curriculum developers and policy makers shall use these as guidelines and indicators to develop their course or curriculum learning objectives and expected learning outcomes in order to reflect

the necessary competencies. Where the pedagogy learning is involved, teaching should also include different modes and techniques of learning using different domains and scales, local or at global level where it allows learners to associate with situations to make sustainable resolutions. In order for the graduates to be recognized as a change agent, they should be able to apply the concept of UNESCO/ESD that states; *"Think Globally, Act locally"* (UNESCO, 2014).

The case study analysis also recommends that the university should formally introduce the ESD and Education 2030 into their education system. This will also include teacher and staff up skilling. It is believed that educating the educators will give better results. Regardless of what subjects are being taught, this framework works on general skills that are required to personally and emotionally change the learners. However, putting these competencies in a curriculum or syllabus does not guarantee that the learners will acquire this; therefore, the proof of this ability is to also test the framework for its outcome. While the human resource development goals for college of Asia Pacific Studies already mentions about sustainable development, it is believed that the college is just a few steps away from being fully recognized for its sustainability contribution. This will also depend on how well the essence of sustainability competencies are captured and designed into the curriculum and syllabus. Therefore, while under reform the college should also consider and enhance the existing curriculum for inclusion of the other key competencies of sustainability which proposes comprehensive general skills and abilities. The curriculum learning objectives and expected learning outcomes needs to be redesigned to reflect the principles of each of the criterion outcomes and keywords. This will contribute greatly in their delivery of teaching and learning.

ESD is all about sustainability of educational outcomes that the learners need to sustain upon completion of their studies. These skills are there to stay with the graduates for their life time.

For credibility and transparency of the curriculum, it needs to be further standardized and quality checks should be performed by an independent third party. A third party can be curriculum experts in similar fields of studies, policy makers or national or specialized accreditation bodies. It is important that the courses or programs offered needs to be recognized and accredited at national levels or by specialized agencies before moving beyond the borders. On the international level and in order for the programs to be recognized internationally, most international agencies first seek the HEIs recognition through the national or recognized agencies. In that being said the key components the agencies firstly look into is the kind of competence the programs or courses offers. These competencies are than benchmarked at international level.

6.4.1   Research Contribution

The designed and developed methodology of EFSC will serve dual purpose. Firstly, it can be used to evaluate the existing curriculum and syllabus to demonstrate the level of key sustainability competencies using the criterion outcomes and standard keywords. Secondly, this can serve as guidelines and indicators to develop or design new curriculums with inclusion of sustainability competencies or general/common abilities. Therefore, the EFSC framework is competent towards curriculum development as the curriculums and syllabus content can be evaluated. The competency outcomes listed in the EFSC are relevant and based on ESD indicators that has the abilities to be measured in the curriculum and or syllabus.

The research further contributes towards developing the educational outcome using the EFSC and can be the learning model for both developed and developing countries. It can further

establish a framework for further curriculum and educational development. The EFSC framework can further enhance the assessment of learner outcomes by reflecting inclusion of sustainability competencies or the general skills. The EFSC can form indicators to assess learning outcomes. It can be useful or used as a measuring tool. However, further consultation with the teaching faculty and interested parties involvement will be required to streamline the measurement tool. It will be dependent on the type of courses, resources involved, assessment methodology and modes of delivery involved. A relevant method of learner assessment would need to be developed using the proposed EFSC framework. The efficacy and relevance of the successful curriculum depends on the success of key indicators within the curriculum and the syllabus. This indicates that the quality of learning to transpire and for learners to successfully use the learning for their personal transformation, cognitive, social and emotional development, the process of effective learning should be enhanced by way of having a quality curriculum (Stabback, 2016). The overall process will reassure improvement for good practices and inclusion of comprehensive skills to enhance teaching and learning.

6.4.2   Research Limitation

Standardized and or technical courses normally has certain specialized skill set or learning outcomes based on the objective of the courses, e.g. engineering or medicine therefore, the proposed EFSC framework may not fully serve for the purpose of evaluating technical curriculum or syllabus. The proposed EFSC can be used for non-technical courses such as social science, humanities or science. However, the common or general abilities can reflect in both kinds of learning such as soft skills that are required by the job market. Studies also show that such general skills or common abilities that are similar to sustainability competencies as

mentioned previously in the literature review play equal importance in any field of studies. How the curriculum is developed and implemented using these competencies into technical or specialized fields are where this research is limited.

Additionally, the use of scientific definitions for keywords and country definitions will vary. Integrating these competencies and how this will be reflected into different field of studies will change based on the national educational objectives and the country definitions. However, this framework shall serve as guidance for any policy maker or curriculum developer which can be further reformed.

This research also notes that the teaching faculties in APU used as case study has not been subjected to Education 2030 or ESD goals and has not been introduced to inclusion of such competencies into the curriculum. Since the program and courses are also not aligned to ESD requirements or the key competencies of sustainability, evaluators or assessors cannot use this framework to measure learner output or outcomes. Therefore the research only focuses on existing curriculum evaluation and not the assessment and measuring skills of the learners, thus it purely and only relates to what and how these competencies should be reflected into the curriculum.

7 CONCLUSION

While the process of rethinking of higher education is in place, determination of competencies using ESD and mapping these competencies into the curriculum depends on the countries specific needs and development strategies. On national policy level, Japan has acquired an enormous contribution and support of UNESCO projects for a betterment of the future and sustainable society. As much as the policies, guidelines and practices are in place, the government does not force institutions to adapt to the requirements but rather encourages institutions to come forward by way of promoting the existing members best practices and recognizing their efforts towards promotion of ESD. However, internalization and globalization of education is a greater concern for sustainable and just society, therefore to promote education and ESD Japan has well adopted and is using the basic plan by revising their basic Act on Education.

To meet the need of the current and future job markets globalization and internationalization calls for review of educational frameworks within HEIs. This gives eminent effect to the educational goals and its physical delivery of programs using the curriculum. While evaluation is one of the stages for the curriculum cycle, it should not be ignored.

HEIs in general needs to re-consider learning and development approach whilst using the key components of sustainability competencies to assess their learning accomplishments and assessing outcomes using the new indicators as proposed in this research. This ensures quality and relevance of learning throughout the course or program. As majority of the universities including APU is moving towards internalization, programme output and curriculum should meet the quality and international requirements as this defines the standards for qualification recognition and general skills. HEIs should take initiative to move forward to accomplish the

goal of ESD and quality education. One does not need to wait for government to regulate this in order to implement the necessities and being proactive to the needs of globalization.

To ensure the transition and inclusion of education 2030 and ESD, teacher up skilling is necessary and more involvement of industry, employer or community is needed to drive the changes. A survey conducted among the academia shows that majority of academics and policy makers in higher education strongly believe that the employers should work with the universities or HEIs to prepare students for future job market. Curriculum that develops further knowledge and employability skills and those employability skills should be covered in the existing syllabus or curriculum also responded the highest. While a few considered that the curriculum should develop specific knowledge and employability skills in their chosen field of studies (author analysis as per appendix 9.4). In other words the curriculum shall be embedded with employability skills or soft skills similarly to the sustainability competencies that are recognized by the employers. It is all about using these competencies to be able to adapt to any kind of environment or situation. Those learners that are able to change themselves emotionally are believed to be exceptional employees (Bradbery, 2017).

The literature review showed the theoretical justifications as to why the sustainability competencies are important in transforming learners. Later, it showed that using the sustainability competencies and the effort of continuing the ESD initiatives, the research provided evidences that framework such as EFSC are lacking and were not related to all the eight key competencies of sustainability rather not comprehensive. Therefore, the research further designed and proposed the EFSC to show how the framework can be used to perform gap analysis within the curriculum and syllabus. The proposed EFSC can be used for both

technical and non-technical courses; however, extra strategic outcomes would be required for technical and specialized studies.

This proposed EFSC framework can be applied by any HEIs regionally and internationally. The designed methodology serves two purposes. Firstly, it can be used to evaluate existing curriculum and or syllabus to find out the level of sustainability competencies demonstrated. Secondly, it can form a framework for designing, writing or developing a new curriculum and syllabus. Most importantly the framework finds out whether the existing curriculum already has inclusion of sustainability competencies rather than re-orienting the whole curriculum & educational goals. The framework proposed criterion outcomes and standard keywords that were tested using the case study of two areas of studies under College of Asia Pacific Studies. The intended criterion outcomes from the EFSC framework for sustainability competencies in this research can act as indicators for inclusion of sustainability competencies into the curriculums and syllabus. Using this framework as methodology, it demonstrated and indicated the level of sustainability competencies present within the existing syllabus (as shown in the chapter 5) and provided recommendations in the following chapter (6.2 & 6.4). It gave a clearly picture of how the sustainability competencies were reflected in each of the subjects. College of Asia Pacific Studies should also consider and enhance the existing curriculum for inclusion of the other key competencies of sustainability such as strategies, anticipatory, normative and critical thinking. The curriculum needs to be further standardized and quality checks should be performed by an independent third party for its accountability and credibility. Therefore, the proposed EFSC can be also used as a guidance to design, re-design and develop curriculum that reflects the key competencies of sustainability. The major finding during designing and implementation of the EFSC was that the framework can be used

successfully to evaluate the syllabus as well rather than focusing only on curriculums. The process of using syllabus to test the EFSC proved to be effective.

However, further in depth consultation and collaboration with relevant stakeholders is required to make it operational at University level. These include consultation with curriculum and ESD experts, policy makers, HEIs and stakeholders are required to review this framework. It is implicit that any curriculum, program and syllabus do not limit knowledge of only one system or structure. The curriculum developers and policy makers shall use these as guidelines and indicators to develop their course or curriculum learning objectives and expected learning outcomes in order to reflect the necessary competencies.

HEIs who are not subjected to ESD initiatives or who are planning to be part of ESD initiatives can use this proposed EFSC framework to perform gap analysis rather than re-orienting the whole course, curriculum and syllabus to meet the sustainability competencies. This process will encourage improvement for good practices to enhance quality of teaching and relevant learning. The research output also expresses to the readers on how the competencies can be unpacked and positioned during curriculum planning and designing or syllabus writing.

The proposed EFSC is designed to evaluate the sustainability competencies of ESD through checking the syllabus, which is the scope of the thesis. However, the biggest challenge still remains, and that is, how to measure the learning outcomes of these competencies. That is, whether learners have acquired the necessary competencies after education needs further elaboration.

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9 APPENDICES

Appendix 9.1 Sample Syllabus

Course Objectives	Pollution, mainly caused by industrial development, has been degrading the environment in various ways. The phenomena and mechanism of water, air, soil and noise pollution will be explained in the lectures with examples. Later, waste treatment is focused as the effective way to prevent pollution, about technologies and system design. Furthermore, advanced technology helps to turn waste to treasure through recycling. To know how to deal with pollution and waste from the interdisciplinary perspective will lead to a deeper understanding of relationship between environment and development.
Standards for Course Completion	Students are expected to have knowledge of the pollution of water, air, soil and noise about the mechanism and the way to prevent pollution, moreover, to understand the basic concepts and methods of waste management. Through the case studis, students can also raise the environmental consciousness.
Teaching Methods	PPT slides and some videos will be used for the lecture. Group work will be conducted in the lectures. *This may be adjusted later according to the actual lecture situation.
Overview of Each Class	Lecture Topics: 1. Introduction of Environmental System 2. Water Quality and Water Polltuion 3. Air Pollution and Control 4. Soil Pollution and Control 5. Other Pollution Problems 6. Municipal Solid Waste Management 7. Establishing a Sound Material-cycle Society *Lecture schedule may be adjusted later according to the actual lecture situation.
Method of Grade Evaluation	Attendance: 20% Quiz or Group work(s): 40% Final examination: 40% *Evaluation methods may be adjusted later according to the actual lecture situation.

Appendix 9.2 Example showing subject ED01 Results

ED01					
No	Competency	Standard Keywords	Score	Relative Keywords	Synonyms
1	Systems Thinking		2.5		
1.1	The curriculum uses different methodologies, principles, frameworks, numerical concepts and structures to allow learners gain skills to recognize and understand different kinds of relationships concerning social, environmental and economy.	Complex systems, networks, structures, framework, principles, procedure, practices, modus operandi, kinds of relationship, numerical concepts	1	methods/ concepts/systems	
1.2	The curriculum teaches learners how to deal with uncertainties by critically analyzing complex systems.	Uncertainty, firm actions, questionable norms, critical analyses	0.5		Future mechanisms

1.3	The curriculum allows learners to obtain numeracy skills and the ability to think how different systems within different scales and domains are embedded globally.	Domain, scales, size, standards, systems, frameworks, recognizing & understanding relationships	1	Relationship between env. & development. know-how of systems	
2	**Strategic**		**2**		
2.1	The curriculum allows learners to gain literacy skills in short and long term planning, developing and implementing innovative ideas to advance sustainability.	Innovative actions, creative, critical thinking, developing & implementing ideas, short & long term planning	1	System design as innovation	
2.2	The curriculum reflects abilities to implement innovative solutions both at local and international level.	Implementation strategies, targets, actions, sustainability advancement	0.5		Effective way
2.3	The curriculum teaches learners collaboration, partnership and communication skills.	Collaboration, partnership, communication skills, group activities	1	Environment & development is sustainability concept. Group work	
3	**Anticipatory**		**2**		
3.1	The curriculum teaches skills that allows learners to understand and evaluate multiple, desirable and possible futures and ability to create own vision for the future.	Evaluation skills, desirable and possible futures, creating vision, proactive, preventative actions	0.5		Effective way
3.2	The curriculum provides necessary knowledge, skills and attributes to deal with risks and changes and assess consequences of actions.	Assessing consequences, dealing with risks and changes	1	Environment & development is sustainability concept	
3.3	The curriculum provides knowledge and skills to analyze and apply the precautionary principle.	Application, precautionary principles, implementation skills, analysis	0.5		concepts & establishing
4	**Normative**		**1.5**		
4.1	The curriculum provides abilities for learners to understand and reflect the norms, values and one's action towards sustainability	Norms, values, cultures, one's action, attributes	0.5		Understanding env. Values/systems
4.2	The curriculum provides skills to negotiate sustainability values, principles, goals and targets.	Negotiation skills, sustainability values, goals, principles, targets, respecting others, reflecting	0.5		reducing waste

		targets			
4.3	The curriculum provides knowledge and skills to deal with conflict of interests, trade-offs, contradictions and uncertainty.	Dealing with conflict of interest, trade-offs, resource management, uncertain knowledge, behaviour and understanding one's action	0.5		Environment & development is sustainability concept
5	**Critical thinking**		**1.5**		
5.1	The curriculum allows learners to questions practices, opinions and norms while reflecting their own values	questioning practices, opinions, norms, rationalize concepts, reflecting own values	0.5		know how to deal
5.2	The curriculum provides knowledge and abilities to take actions and value perceptions towards sustainability discourse	abilities to take action, valuing others perception, sustainability discourse	0.5		interdisciplinary perspectives
5.3	The curriculum address sustainability issues and potential risks	sustainability issues, decision making, reflecting opinions and actions	0.5		consciousness
6	**Collaboration**		**2**		
6.1	The curriculum allows provision for learners to learn and develop empathic leadership skills by respecting and understanding the needs, perspectives and actions of others and being sensitive to others	empathic leadership, understanding and respecting needs, perspective and actions of others, sensitivity to issues, humanity	1	Group work	
6.2	The curriculum provides skills to deal with conflicts in groups and enhances communication skills	dealing with conflicts, communication skills	0.5		env. Consciousness
6.3	The curriculum facilitates teamwork, cooperating, collaborative and participatory problem solving abilities for learners to develop necessary skills	Facilitates teamwork, collaborative, participatory approach, problem solving skills	0.5		deeper understanding
7	**Integrated problem-solving**		**2.5**		
7.1	The curriculum clearly outlines the competencies required to integrate problem solving abilities and allows learners to think critically for unified solutions to difficult issues	Promoting sustainable development, problem-solving abilities, critical thinking skills, equitable and inclusive solutions	1	Environment & development is sustainability concept	

7.2	The curriculum provides learners the capacity and skills to solve complex sustainability problems using problem-solving frameworks and information technology to develop viable, inclusive and equitable solutions	Problem solving frameworks, complex sustainability problems, use of information technology for unified solutions	**1**	System design as innovation	
7.3	The curriculum promotes sustainable development concerning environmental, social and economic concepts and its application skills	promotes sustainable development, multiple problem solving frameworks	**0.5**		Technologies & system designs. Environmental consciousness
8	**Self-awareness**		**2.5**		
8.1	The curriculum reflects leadership, innovative and decisive skills and motivates learners own role in the local or global community	Leadership skills, motivational skills, building capacity at local and international level	**1**	building capacity to reduce waste	
8.2	The curriculum teaches skills to continuously evaluate and further motivate one's action and abilities to adapt to situations and changes	Evaluations skills, motivating one's action, abilities to adapt to changes	**1**	interdisciplinary perspectives	
8.3	The curriculum teaches how to deal with one's feelings and desires towards sustainability discourse and act as a responsible local and global citizen taking into account customer and business awareness	Dealing with one's feeling, sustainability discourse, acting as responsible local and global citizen, customer and business awareness	**0.5**		Environmental consciousness. Sound material cycle society

Appendix 9.3 Interview survey questions for NIAD-QE

Questionnaires on Higher Education Evaluation System of Japan

Below are some of the exercises and questions that would help prepare your team for the upcoming meeting in regards to my research on Japan's higher education system with inclusion of UNESCO-ESD project.

1. Discuss the **overview and design** of the:

    1.1   National Qualifications Framework (NQFs) and

    1.2   National Quality framework

    1.3   Good Practices of the system

2. How does the **Education for Sustainable Development(ESD) indicators are being reflected** or captured on the respective frameworks:

    2.1   To **measure student learning outcomes**

    2.2   To **ensure quality graduates** are produced

3. How do you **ensure career pathways of learners** through the NQFs?

4. How is the **student learning outcomes measured**? (Can a couple of examples been shown maybe at Diploma and undergraduate level)

4.1 Is there **any framework to measure student learning outcomes or educational outcomes** provided on national level to the HEIs

4.2 Does the policies change between **national, private and public** HEIs

5. How does monitoring quality in education reflect the multidimensional approach of **design, input, process and outcome** at:

    5.1   **National level** and

    5.2   Its further implications at **international level** (recognition of **cross border quality** policies)

6. What are some of the specific **tools/indicators** used by the Japanese education system to in cooperate the ESD requirements and the impacts on curriculum design

7. What are some of the **implementing challenges** of sustainability inclusion at higher education level

8. What **significant change** did implementation of UNESCO project of DESD brought into the Japanese education system

9. Your thoughts on inclusion of DESD into education system and its **major impacts on assessing learning outcomes and function of University's assurance of learning**.

Appendix 9.4 International Forum Survey on Sustainable Development & Competencies

International Forum Survey

This survey is conducted for the purpose of research on Education for Sustainability (ESD) in Higher Education. The main aim of the questionnaire is to collect information on each of UNESCO member countries commitment towards ESD and Sustainable Development Goals 2030 (SDGs).

Country Name: _____

Are you representing: ☐ *Higher Education Institutions (HEIs) or* ☐ *Quality Assurance Agency (QAA)*

1. Do you agree with the following statements?

	Strongly Agree	Agree	Do not Agree
Sustainable development should be promoted by all the HEIs			
Sustainability competency should be integrated within the curriculum			
HEIs should be obliged to develop students' economic, social and environmental skills as part of their courses			
Do you think IQA in HEIs should quality assure the process of ESD & key competencies of sustainability inclusion into the curriculum			

2. There are 8 key competencies of sustainability recommended by UNESCO, 2017. How well do you think your country's education system or HEIs has represented these competencies?

Strongly – the education system has adopted UNESCO goals on Education for Sustainable Development

Partially – there are plans and ongoing consultation with relevant stakeholders

Not covered – the sustainability competency or ESD is not at all considered in the national curriculum policy or HEIs educational policy.

Key Competencies of Sustainability (UNESCO, 2017)	Strongly	Partially	Not covered
Systems thinking competency: the abilities to recognize and understand relationships; to analyse complex systems; to think of how systems are embedded within different domains and different scales; and to deal with uncertainty.			
Anticipatory competency: the abilities to understand and evaluate multiple futures – possible, probable and desirable; to create one's own visions for the future; to apply the precautionary principle; to assess the consequences of actions; and to deal with risks and changes.			
Normative competency: the abilities to understand and reflect on the norms and values that underlie one's actions; and to negotiate sustainability values, principles, goals, and targets, in a context of conflicts of interests and trade-offs, uncertain knowledge and contradictions.			
Strategic competency: the abilities to collectively develop and implement innovative actions that further sustainability at the local level and further afield			
Collaboration competency: the abilities to learn from others; to understand and respect the needs, perspectives and actions of others (empathy); to understand, relate to and be sensitive to others (empathic leadership); to deal with conflicts in a group; and to facilitate collaborative and participatory problem solving.			
Critical thinking competency: the ability to question norms, practices and opinions; to reflect on own one's values, perceptions and actions; and to take a position in the sustainability discourse			
Self-awareness competency: the ability to reflect on one's own role in the local community and (global) society; to continually evaluate and further motivate one's actions; and to deal with one's feelings and desires.			
Integrated problem-solving competency: the overarching ability to			

apply different problem-solving frameworks to complex sustainability problems and develop viable, inclusive and equitable solution options that promote sustainable development.			

3. **From your personal view, how relevant is it to you that the competency/skills from (No. 2) are developed through the university education system?**
   ○Extremely relevant   ○ somewhat relevant   ○ Not Relevant

4. **How important do you think the following skills are to your future employers when compared against each other?**

	1 (Very important)	2 (somewhat Important)	3 (not so important)
Application of IT, literacy & numeracy			
Communication & collaboration skills			
Application of social and environmental skills			
Problem solving & Critical thinking skills			
Business and customer awareness			
Adapting to new situations & changes, Short term and long term planning			
Leadership, innovative & decisive skills			
Acting as a responsible local & global citizen			
Empathy & understand people's relationship to nature			

5. **To what extend do you agree with the following?**

	Strongly Agree	Agree	Do not Agree
The University is responsible to prepare students & learners for job market			
Learners & Students should prepare themselves			
Employers should work with universities to prepare students for future & job market			
Conduct extra activities to develop the skills required for job market			
My University/country education systems already has activities to prepare students & learners for the job market			

6. **Select an option that you think will prioritize the skills, knowledge and attributes required by the job market?**
   ○Curriculum that develops further knowledge and employability skills
   ○Curriculum which develops specific knowledge/employability skills in your chosen field of studies
   ○ Employability skills should be covered in the existing syllabus or curriculum

Appendix 9.5 Questionnaire for APU - used as a Case Study

It would be grateful if your office can answer and share the below information for the purpose of my graduate research thesis to make appropriate study and recommendations where appropriate. The questionnaire is divided into two sections.

Section 1: Design and Development of Curriculum/syllabus

1. Is academic office responsible for ensuring the design and development of curriculum in APU?

2. Who designs the curriculum or syllabus? Is it the Professors, division or academic office?

3. For the answer in # 2, if more than one person is involved in designing and developing the curriculum what are their individual roles and to what percentage are there contribution.

4. Is there any standards curriculum/syllabus format that is used to develop the appropriate curriculum?

5. How often is the curriculum or syllabus reviewed?

6. Who or which department ensures that the respective college goals and University objectives are well reflected into the curriculum/syllabus?

7. Who or which department quality assures that all the curriculums/syllabus written is of quality and per standard of the internal (within APU curriculum policy requirements) and external (eg. JUHAA, NIAD-QE or MEXT ETC.)

Section 2: Student Evaluation

8. According to my experience there are two types of evaluation conducted in APU. One is from academic office where students are asked to evaluate the course learning process and contents. How this information is used to improve the overall program and are students' opinion considered?

9. Are the students provided with feedbacks on the overall evaluation and how their recommendations were incorporated for continuous improvement?

10. Who or which department ensures the above process?

11. For the second kind of evaluation performed by the Professors during the learning process and to ensure whether the learners have acquired the necessary knowledge, skills and attitudes, how is the student assessment results used by the university?

12. Who ensures that the method of evaluation for a particular course or curriculum is followed by the teaching faculty or Professors?

13. How is the University using the student's assessment or evaluation results to enhance student learning?

14. Overall is there any best practice within the University system that ensures learners or students feedbacks and assessments are being highly considered to promote educational effectiveness?

15. How does the university measure its mission and goals statement that is set to achieve its educational purpose?