Relevance of Strategically Planned Engineering Education
for Sustainable Development

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Abstract

Every nation is paying attention to and strategically improving SDG-4 (Quality Education) itself and using it as a tool for fulfilling other related SDGs. Today, engineering education plays a vital role in implementing a significant portion of SDGs and thus strategic plan for engineering education also becomes important. Although many of existing works have focused on how to implement SDGs through education, there are very few works which study on the relevance of educational strategic plan for SDGs.

The objectives of this paper are to review how higher education, which includes engineering education, is strategically planned in a National Education Strategic Plan and to analyse which strategies support other SDGs in addition to SDG-4. As a case study, the review is conducted for Myanmar NESP (2016-2021). By means of questionnaires, a total of 240 institute/university heads of departments/deans, teachers/lecturers and students from fifteen different universities are surveyed to explore relevance of NESP for other SDGs in addition to SDG-4.

First, according to intuitive analysis, it finds that Myanmar NESP strategies for higher education support SDG-6, SDG-7, SDG-8, SDG-9, SDG-13, SDG-14, SDG-15 and SDG-17 in addition to SDG-4. It is agreed and verified by survey results. The survey results show that in addition to SDG-4, NESP can support SDG-9 in second place, SDG-11 in third place, SDG-6 in fourth place, SDG-7 and SDG-17 in fifth place. More than 95% agree to strategically include the concept of sustainable development in university curriculum. A total of six potential recommendations are made to be considered in developing a NESP in the future. These are (1) to have policy/strategy for inclusion of SD concept as an elementary course in universities, (2) to increase policy/strategy for promoting STI through research, (3) to have policy/strategy for promoting "Education for SD" in teacher education, (4) to increase policy/strategy to promote SD through campus operation, (5) to have policy/strategy for promoting technological entrepreneur (techno-preneur) (6) to have policy/strategy for initiating graduate programs in "Sustainable Development" in universities.

Keywords: Engineering Education; Sustainable Development; Education Strategic Plan; Education Transformation; Education Management

1. Introduction

Nowadays, the dramatic increase of world's population is continuously calling for everything (for example, food, land, water, energy, etc.) in much more amount than current condition. Also, high competitiveness in different perspectives of mankind could bring imbalanced power, unequal opportunity, less resources, low level quality, uncontrollable environment and uncertain future to our society. Consequently, it will bring undesired social problems and dangerous living environment which will destroy peace of human society.

Thus, the term "Sustainable Development (SD)" becomes important to make balancing among different societies and to make human society and natural systems in harmony. Sustainable Development is defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (United Nations General Assembly, 1987). Al-Rawahy (2012) encouraged that this concept must be not only a theoretical undertaking but practically executed. It alarms us to organize, well manage, set targets and practically implement the concept of SD seeing as a global challenge.

In September 2000, the UN agreed and announced the eight Millennium Development Goals (MDGs) as a global project to be implemented by 2015 (Binagwaho, 2005). Here, the UN set education at the heart of its strategy to promote sustainable development and promoted the Principles for Responsible Management Education (PRME) and Programme on Education for Sustainable Development. Also, it defined the period of 2005-2014 as the UN Decade for Education (Annan-Diab and Molinari, 2017).

As a continuing project, increasing the priority sectors, the UN again outlined seventeen life-changing goals called "Sustainable Development Goals" to reach by 2030 (UNDP, 2015). While MDGs focus on universal primary education, the SDGs address the relevance of education at all levels as a strategy to promote awareness of sustainable development (Avelar, da Silva-Oliveira and da Silva Pereira, 2019). Today with advanced technologies and research, Science, Technology and Innovation (STI) becomes one more tool to apply in order to successfully implement the agenda 2030. The UN Inter-agency Task Team (IATT) has been working towards developing STI Roadmaps for SDGs as part of the Technology Facilitation Mechanism (TFM) (Partnership Platform, 2019).

Thus, it is essential to promote altitude/ethics-oriented knowledge and technology-oriented knowledge of society through education. Only one thing that can give these two kinds of knowledge in one package is engineering education.

Many countries including Myanmar are trying to reach every SDG through their own well-planned strategies. In Myanmar, education transformation is currently being conducted through NESP (National Education Strategic Plan, 2016-2021) which was developed in 2015. Therefore, being different from most previous works, the objectives of this work are to highlight the relevance of a National Education Strategic Plan on implementing SDGs by reviewing higher education in Myanmar NESP (2016-2021) as a case study and to make some recommendations for future NESP.

The rest of this paper is organized as follows. The second section is review on related works which discussed education for SDGs. The relationship between engineering education and SDGs is discussed in the third section. In the fourth section, NESP of Myanmar is reviewed and its relevance to SDGs is intuitively   analysed and verified through a survey. Some recommendations for future NESP are made in fifth section which is followed by conclusion.

2. Related Works

In literature, there have been many works that related to education for SDGs and the increasing number of works show the importance of educational approaches as a means of implementing the SDGs (Avelar, da Silva-Oliveira and da Silva Pereira, 2019).

Recently, Nousheen et al, (2020) conducted a survey to investigate the effect of course on teachers' altitude towards sustainable development. The authors observed that teachers who studied education for sustainable development subject have attitude towards sustainable development compared to their counterpart student-teachers who did not study sustainable development subject.

The role of transformation learning and education was studied by Leal Filho et al., (2018). The authors recommended using teaching and learning, research, community engagement and general campus operations as tools for transformation in learning and education for sustainability. For examples, general campus operations such as maintenance, enhancements, sustainability, and safety initiatives must be connected with teaching and learning.

In their study, Lazzarini, Perez-Foguet and Boni (2018) recommended that policy makers of higher education institutions should set appropriate policies and mechanisms to facilitate faculty engagement in sustainable development. Their recommendations are (1) engaging sustainability champions and potential 'connectors' (2) integrating policies and mechanisms to recognize the work of academics engaged in SD and (3) advocating at regional and national level for a reform of competency requirement of engineering that integrates SD principles. The authors also suggested that the universities should devote more efforts towards exploring internal mechanisms to promote the engagement of academics in sustainable development. For example, assessment of personal efforts within particular academic functions is important.

Especially for engineering education, the future engineering skills were described in the work of Duarte et al., (2019). These skills are re-illustrated in Table 1. It can be noticed that most skills are related to ethics and sustainability. The organizations which conducted survey pointed to the need to address aspects of sustainability in higher education engineering course.

Table 1 Future Engineering Skills (Duarte et al., 2019)

Organization which conducted survey	Strong technical-scientific background	Interdisciplinary	Working in complex teams	Improve the quality of life for all	Rational usage of global resource	Social responsibility	Environmental responsibility	Develop sustainable society	Environmentally friendly technology	Cultural responsibility
UNESCO	✓	✓	✓	✓	✓	✓	✓	✓	✓	
ENAEE	✓	✓	✓	✓		✓	✓	✓		✓
ABET	✓					✓	✓	✓	✓	✓
NAE	✓			✓	✓	✓	✓	✓	✓	✓

Al-Rawahy (2013) pointed out missing link between engineering education and sustainable development in his research study. The missing link was ethical and a moral decision. It was argued that universities need to proactively and aggressively 'infuse' ethical and moral teachings and values into their respective curricula.

Annan-Diab and Molinari (2017) discussed the importance of adopting an interdisciplinary approach to education for sustainable development and concluded that such as climate change, poverty and human rights require knowledge and skills from distinct disciplines in an integrated manner.

Halbe, Adamowski and Pahl-Wostl (2015) examined the role of paradigms in engineering practice and education for sustainable development. Multiple paradigms were analysed for sustainable flood management as a case study. The authors reported that combination of paradigms was a more promising approach to attain sustainability.

Laurent et al., (2019) discussed the role of Life Cycle Engineering (LCE) in meeting SDGs. For example, to meet SDGs, product development should focus not only on designing better products (in terms of quality, efficiency, revenue, etc.) but also on designing more sustainable products. For example, recyclable materials should be used for making a product although it can be costly than using plastic.

Poorly-designed engineering systems have negative impacts such as pollution, global warming, depletion of scarce resources, and catastrophic failures Duarte et al., (2019). Thus, engineers should have ethic, critical thinking ability and skill to design systems and to perform actions by sustaining rather than degrading the natural environment. In this context, engineering education becomes important and strategic plan of a nation for engineering education comes into essential scope to discuss.

In the study of Kamp (2006), three interconnected operations approved at Delft University of Technology were described and discussed. These operations are (1) designing an elementary course 'Technology in Sustainable Development' (2) intertwining the concept of sustainable development in all regular disciplinary courses (3) developing a possibility to graduate in a sustainable development specialization. It was aimed to promote the concept of sustainability development among students. As a result, over 150 students have enrolled in sustainable development graduation specialization. The authors stated that the support from leading scientists, lecturers and the university board is important to integrate SD fully into the curricula.

From this literature review, the overall view is that higher education (especially engineering education) plays a vital role in reaching SDGs. Thus, strategic plan for engineering education becomes consequently essential. Here, it motivates us to study relevance of a national education strategic plan for SDGs (Myanmar NESP as a case study) and to make some recommendations for future NESP.

3. Engineering Education and SDGs

The degree of success in coping with complex issues and fostering sustainable development depends largely on educational standards in society (Kolb et al., 2017). The success of SDG implementation significantly depends on the knowledge and education of our society. Thus, access to quality equation of every individual becomes one essential goal to attain in both 15-year long projects (MDGs and SDGs) of UN.

In MDGs shown in Fig.1, education related goal is to "*achieve universal primary education*", more specifically, to "*ensure that by 2015, children everywhere, boys and girls alike will be able to complete a full course of primary schooling*" with a belief that educating children gives the next generation the tools to fight poverty and prevent disease, including malaria and AIDS.
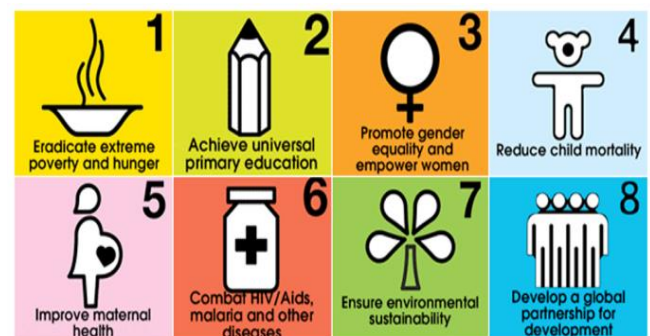

Fig. 1 Millennium Development Goals (MDGs) of UN (UN, 2015)

In SDGs shown in Fig.2, education related goal is to "*ensure inclusive and equitable quality education and promote lifelong learning opportunity for all*" with a belief that a quality education is the foundation for creating sustainable development. In the targets of this SDG, all levels of education (basic education, vocational education and higher education) are included.

Here, a new vision is that not only education but also STI (Science, Technology and Innovation) are critical elements needed by all countries to achieve SDGs. Since SDG-9 aims to build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation, STI itself is a sustainable development goal (ARTNET, 2019). It can help to realize other SDGs.

By combining these two aspects, STI related education becomes a key for the success of SDGs. Kolb et al., (2017) illustrated the importance of education naming as "SDG pyramid" as shown in Fig.3. Education is the first priority SDG. It has a direct impact on SDGs-8, 9, 12 and 17. Then, through innovation, SDGs-6, 7, 14 and 15 can be achieved. The impact will lead to the improvement of other SDGs.

Fig. 2 Sustainable Development Goals (MDGs) of UN (UN, 2015)

Fig. 3 SDG pyramid by Kolb et al., (2017)

Now giving the parallel priority STI with education, a new version of illustration is presented in this study as shown in Fig. 4. The concept of this illustration can be explained as follows. To successfully implement SDGs, (1) Policy and Strategies (2) Education (3) STI and (4) Partnership and Collaboration can be seen as four main parallel mechanisms. From these four main mechanisms, three mechanisms are SDGs themselves, i.e, Education is SDG-4, STI is SDG-9 and Partnership and Collaboration is SDG-17. These four main mechanisms are

supporting each other and serve as four essential tools to enhance the other SDGs.

First, national policies and strategies are important to have a right way for education, STI and partnership and collaboration. The effect of policies on education can be seen in the works of Yang, Huang and Liu (2014), Heymann, Raub and Cassola (2014) and Masino and Niño-Zarazúa (2016). Then, education will also have impact on all other mechanisms. The quality education will lead to right and wisdom strategies, decision, innovative research idea and willingness to collaborate.

STI will also influence on education because technology can improve the education system and

education quality of a nation. STI also can support partnership and collaboration since there is a term called "Science Diplomacy". Reversely, partnership and collaboration also can improve education and STI of a nation. The effectives of foreign aid to education can be seen in the work of Riddell and Niño-Zarazúa (2016).

When these four main mechanisms are driven well, these will fully support the other SDGs. Here, the connected concept is illustrated Fig. 5. It states that science and engineering education is an essential element to link between education and STI. Thus, engineering education becomes an essential element to achieve the SDG.

Fig. 4 Four main mechanisms for SDGs (own illustration)

Fig. 5 Engineering Education for SDGs (own illustration)

4. Review and Analysis of a NESP

4.1 Myanmar National Education Strategic Plan (2016-2021)

The Ministry of Education under the Government of Union of Myanmar launched its five-year strategic plan for transforming its education system (MOE, 2016). It is currently under implementation. The strategic plan is going to end in 2021. In this strategic plan, there are nine transformation shifts including basic education, TVET education and higher education as shown in Fig. 6.

There is no separated strategic plan for engineering education. It is included in higher education. Thus, strategic plan for higher education is focused in this study. According to NESP, the quality of higher education is improved by means of three main strategies. Each strategy has its own component-strategies as shown in Table 2. There are a total of thirteen component-strategies. The detailed explanation of these strategies and expected outcomes can be seen in MOE (2016). Indeed, all component-strategies are mainly aimed at achieving SDG-4. Here, it is to give an intuitive analysis of how component-strategies additionally link to other SDGs in addition to SDG-4
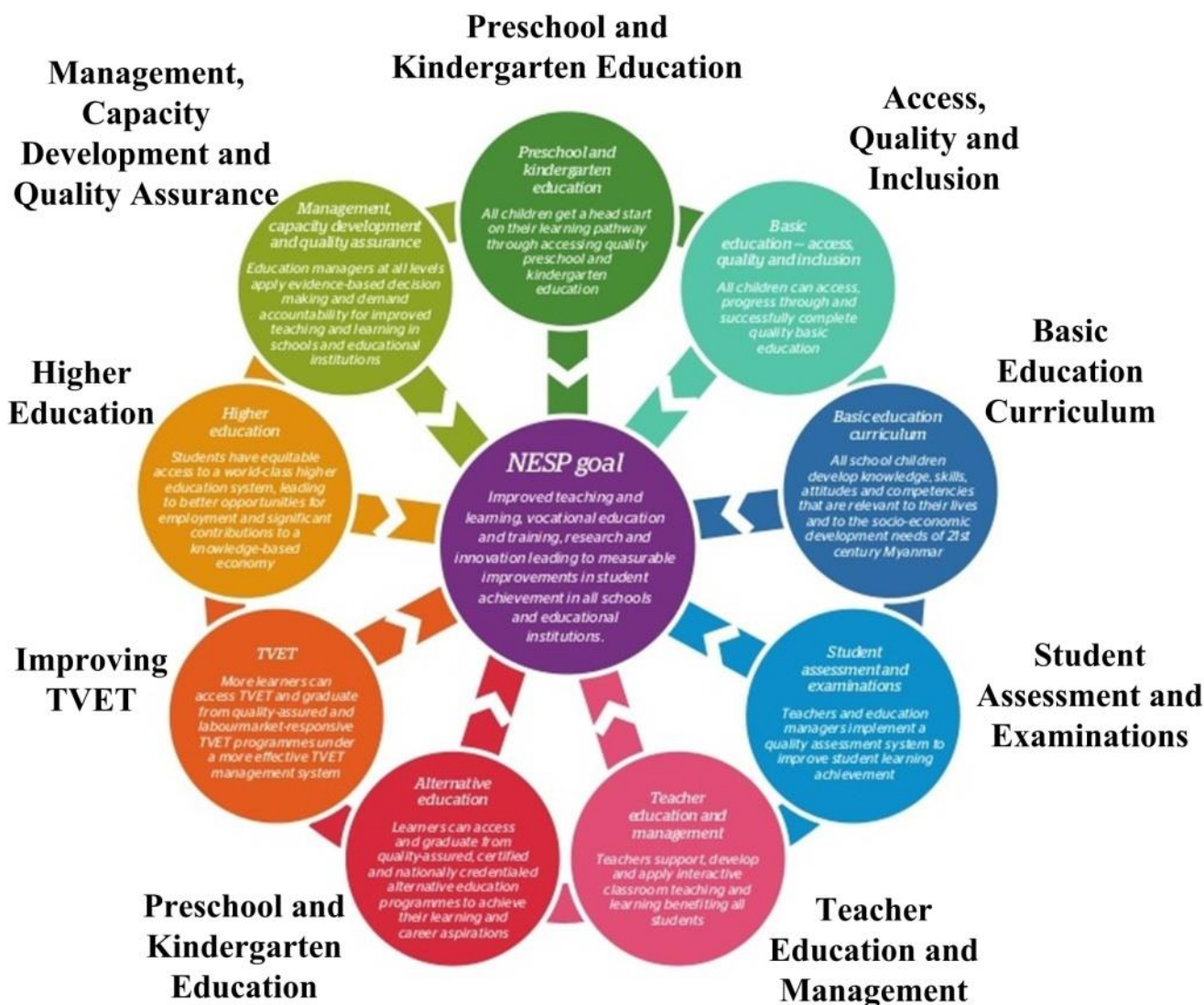
Fig. 6 Nine transformation shifts in Myanmar NESP (MOE, 2016)

Table 2 Strategic plan for higher education in NESP (MOE, 2016)

Strategy 1:Strengthen higher education governance and management capacity		
	Component-strategy	**Direct/Indirect Relevant SDGs**
1	Undertake overseas study tours to document best practices and establish partnerships	[4 QUALITY EDUCATION] [17 PARTNERSHIPS FOR THE GOALS]
2	Establish a National Institute for Higher Education Development (NIHED)	[4 QUALITY EDUCATION]
3	Strengthen governance of HEIs through university charters and university councils	[4 QUALITY EDUCATION]
4	Strengthen autonomy and accountability of HE	[4 QUALITY EDUCATION]
5	Establish a Higher Education Quality Assurance Agency (HEQAA)	[4 QUALITY EDUCATION] [8 DECENT WORK AND ECONOMIC GROWTH]
Strategy 2: Improve the quality and relevance of higher education		
	Component-strategy	**Direct/Indirect Relevant SDGs**
1	Establish a National Research and Innovation Fund and Research and Development Centers at HEIs	[9 INDUSTRY, INNOVATION AND INFRASTRUCTURE] [6 CLEAN WATER AND SANITATION] [7 AFFORDABLE AND CLEAN ENERGY] [13 CLIMATE ACTION] [14 LIFE BELOW WATER] [15 LIFE ON LAND]
2	Develop a policy and strategy for world-class national universities and comprehensive universities	[4 QUALITY EDUCATION]
3	Upgrade facilities at selected HEIs	[4 QUALITY EDUCATION]
4	Enhance the status of e-learning centers and e-libraries	[4 QUALITY EDUCATION]
5	Improve the effectiveness of the distance education system	[4 QUALITY EDUCATION]
6	Undertake professional development for faculty andlaboratory technicians	[4 QUALITY EDUCATION]
Strategy 3:　　　Expand equitable access to higher education		
	Component-strategy	**Direct/Indirect Relevant SDGs**
1	Create a good teaching and learning environment at HEIs	[4 QUALITY EDUCATION] [11 SUSTAINABLE CITIES AND COMMUNITIES]
2	Promote student support programmes	[4 QUALITY EDUCATION]

Under *Strategy1*, *Component1* supports SDG-4 and SDG-17 directly. The other components under *Strategy1* support SDG-4. *Component5* indirectly supports SDG-8 because employment rate and supply-demand matching are essential criterion in HEQAA. It is understandable that if SDG-4 is achieved, all other SDGs such as SDG-8, SDG-1 and SDG-2, could be indirectly achieved.

Under *Strategy2*, *Component1* directly supports SDG-9 and consequently SDG-6, SDG-7, SDG-13, SDG-14 as well as SDG-15. All other components under *Strategy2* support SDG-4.

Under *Strategy3*, *Component1* directly supports SDG-4 and conceptually supports SDG-11 since it is going to develop sustainable campus/ dormitories under the concept of sustainable cities and communities.

As a continued-phase of current NESP (2016-2021), Myanmar NESP (2021-2030) is going to be developed and implemented started from 2021. The Ministry of Education plans to design next NESP

(2021-2030) such that it reaches not only SDG-4 but also other SDGs. For this reason, it is worth to know how current NESP strategies are relevant to other SDGs and impact on awareness of SDGs in higher education society, including students, teachers/lecturers and heads of departments/deans. Therefore, the following survey is conducted for verifying the intuitive analysis above and for making recommendations for future NESP.

4.2 Survey and Results

4.2.1 Methodology

Aiming to verify and support the intuitive analysis of how Myanmar NESP component-strategies link and support SDGs, a survey is conducted. Survey results are reduced as quantitative data. The survey is conducted with the participation of graduated students, undergraduate students, teachers/lecturers and heads of departments/deans from different engineering universities in Myanmar. In survey, both open-end questions and close-end questionnaires are used. Survey questionnaires are designed to explore awareness of SDGs, how their specialized fields/jobs are related to which SDGs, how their research interest are related to which SDGs, what type of SDG-related programs are being offered at their department, what type of SDG-related student activities are being supported and if the concept of SD should be included in curriculum.

From these survey results, two main facts can be seen. First, it is to see which SDGs are being interested or being paid attention by engineering professionals. Second, it is to see if NESP strategies support the SDGs which they are interested in or paying attention to.

The survey is conducted with the participation of 240 respondents. Graduated students, undergraduate students, teachers/lecturers and heads of departments, deans from selected national engineering universities in different areas are chosen as respondents. Graduated students represent the university where they graduated, undergraduate students, teachers/lecturers and heads of departments/deans represent the university where they are currently studying or working.

Half of respondents are male and the other half is female. It includes 53 institute/university heads of departments/deans, 100 institute/university teachers/lecturers, 40 graduated students and 47 undergraduate students from fifteen different engineering universities in Myanmar. Thus, 22% is heads of departments/deans, 16.67% is graduated students, 19.58% is undergraduate students and 41.67% is teachers/lecturers. Approximately, 10-16 responds are collected from each university. All of the universities are public universities.

4.2.2 Awareness on Sustainable Development

From all of respondents, 79% have finished their bachelor degree study. Among them, 41.4% started to joined universities during the period of 2006-2015 when MDGs was set and 31% started their study at university after 2015 when is the beginning of SDGs period.
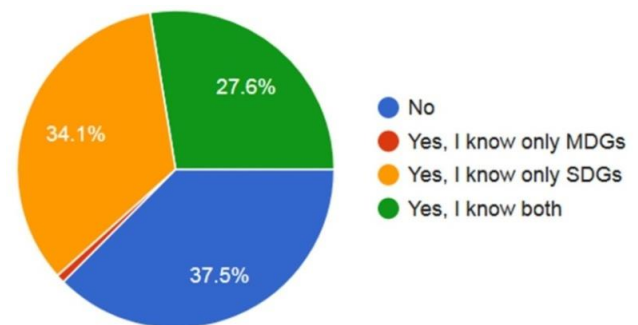

Fig. 7 Familiarity percentage of MDGs and SDGs

According to the results shown in Fig. 7, 37.5% of respondents do not know both MDGs and SDGs at all. Mostly, they are undergraduate students who started to join university after 2015. It is clear that students are less familiar with SD concept. Some possible reasons are because it is not a mandatory topic in a curriculum or less knowledge and information sharing in the class or less participation in SD related activities in the campus. Then, 0.8% know only MDGs, 34.1% know only SDGs and 27.6 % are familiar with both MDGs and SDGs. It shows that awareness of SDGs in education environment is around 60%. Thus, about 40% of respondents have not known or even have not heard about SDGs. Thus, it shows that it is important to hold SD related knowledge sharing talks, seminar, trainings, events, activities in the campus to promote awareness of students and teachers. Also, SD concept should be suitably included in some lecturers in the class.

4.2.3 Relevance of the study field/research/work to SDGs

The results in Fig. 8 show relevance percentage of the study field, research interest and work of respondents to SDGs. It is clear that SDG-4 is mostly relevant to the field of interest/ research/ work of respondent since most of them are heads of departments/deans teachers/lecturers and students. Showing the second largest percentage (49.8%), the field of interest/research/work of respondents are significantly related to SDG-9. SDG-9 is to build resilient infrastructure, promote sustainable industrialization and foster innovation. The reason could be that today most Mechanical, Electronics, Mechatronics, Electrical, IT engineering lecturers and students are interested in and doing researches works focusing on industrial automation and innovation. Meanwhile, Civil engineering students are focusing on innovative infrastructures. It is supported by NESP strategy 2.1.

With relevance percentage of 29.9%, SDG-11 is found at the third place. SDG-11 is to make cities inclusive, safe, resilient and sustainable. Today, most engineering students are interested in and taking part

in maintaining and developing smart home/campus/residents/ cities by means of updated technologies such as IoT (Internet of Things). NESP strategy 2.1 is aligned with it.

SDG-6 is found at the fourth place. SDG-6 is to ensure access to clean water and sanitation for all. In these days, water resource recovery and water and waste water management becomes hot topic in every country. Many of researchers and especially Civil engineering students are working for water and waste water management. NESP strategy 2.1 supports it.

The fifth place is taken by SDG-7 and SDG-17. SDG-7 is to ensure access to affordable, reliable, sustainable and modern energy and SDG-17 is to strengthen the global partnership for sustainable development. Most of Mechanical engineers and Electrical engineers are working for development of renewable energy. Then, today many professors and students are very active in national and international partnership and collaboration in different perspectives. Industry-university linkage is currently being encouraged by MOE and government.

Thus, it promotes SDG-17. The NESP strategy 1.1 supports SDG-17. Thus, the results strongly agree with intuitive analysis of how component-strategies support to other SDGs shown in Table 2.
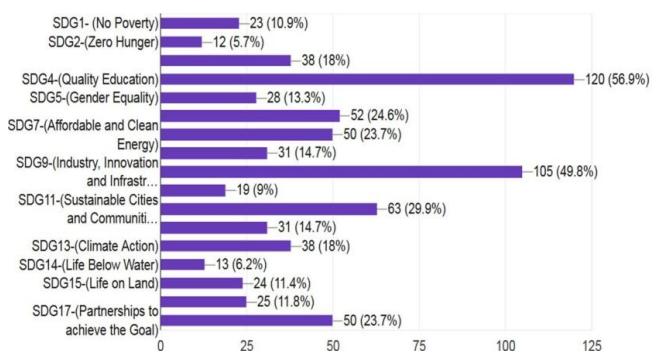

Fig. 8 Relevance of the study field/ research/ work of respondents to SDGs

For other SDGs, showing 18%, SDG-13 (Climate Action) and SDG-3 (Good Health and Well-being) take the sixth level of relevance. In these days, some of lecturers and students are currently participating disaster forecasting and prevention projects and researches. SDG-3 is linked to the engineering researches such as pollution control, biomechanics and digital wellbeing.

With more than 13%, SDG-5 (Gender Equality), SDG-8 (Decent Work and Economic Growth) and SGD-12 (Responsible Consumption and Production) are found at seventh level. Quality assurance which is very important for decent job opportunity is currently being focused in most universities in Myanmar.

Although *Strategy 2-1* supports SDG-14 and SDG-15, the results show less direct relevancy to teachers' researches or students' study. The rest SDGs are less directly relevant to engineering professionals.

4.2.4 SDG Related Programs and Student Activities

In these days, Mechanical and Electrical engineering departments mostly offer energy related programs, Civil engineering departments offer environmental conservation related programs and water related programs. These are related to SDG-6, SDG-7 and SDG-13. Most of departments have partnership and collaboration in which most are school-industry partnership and some are teacher quality enhancement programs. It is aligned with SDG-17.

Most universities have student union and it mostly leads student activities. Student activities include holding project shows which related to SDG-9, campus cleaning activities which is related to SDG-11, volunteering in disaster rescues and other social activities which are related to SDG-3, SDG-5 and SDG-17. Thus, NESP higher education strategies 1.1, 2.1 and 3.1 show a good relevancy.

4.2.5 Perspective on Inclusion of SD in University Curriculum

Today engineering professionals must have interdisciplinary knowledge which includes ethics, economy, social, environment, culture and so on. Thus, even some accrediting bodies (e.g., ABET) have accrediting criteria which states the student must attain and practice SD concept. Thus, it is important to embed the concept of SD in university curricula. Some potential strategies can be found in the work of Segalàs (2009).

Fig. 9 highlights the perspective on inclusion of the concept of SD in university curriculum. More than 95% agree that the concept of SD should be included in university curriculum since it is critically important to explore the interest and care of youth on sustainable development. Based on the review and survey results, the following recommendations can be made for the next phase of Myanmar NESP (2021-2018).
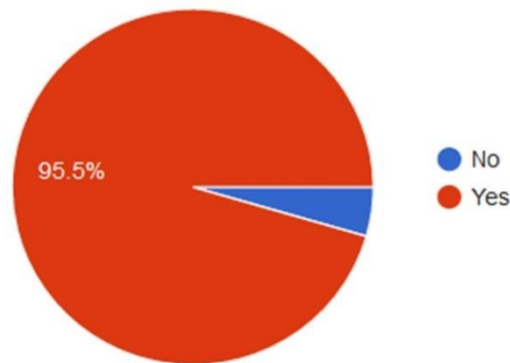

Fig. 9 Perspective on inclusion of SD in curriculum

5. Recommendations for NESP

Generally, NESP should include more strategies that stimulate the concept of Sustainable Development and relate to SDGs. Based on the observations of previous works in the literature and survey results in

this study, the following six recommendations are made to be considered in developing future NESP.

Recommendation 1: Should have policies/ strategies to introduce the concept of "Sustainable Development" as an elementary course in all disciplines of higher education including engineering education. For example, sustainability could be included engineering design considerations. It should be one strategy.

Recommendation 2: Should increase policies/ strategies more to promote the "*Science, Technology and Innovation (STI)*" in universities. STI through researches will contribute a large portion of sustainable development.

Recommendation 3: Should have policies/ strategies to promote "*Education for Sustainable Development*" in teachers' education. Teachers are important ambassadors for increasing awareness of "Sustainable Development".

Recommendation 4: Should have policies/ strategies to promote "Sustainable Development" through campus operation of universities. Campus operation is mostly dominant by students and awareness of SDGs should be increased.

Recommendation 5: Should have policies/ strategies to promote technological entrepreneur (techno-preneur) in institute/ university curricula. Here, technological entrepreneur is aimed for decent work, economy and innovation.

Recommendation 6: Should have policies/ strategies to initiate graduate programs in "Sustainable Development" specialization in universities. This kind of graduate persons will be required in many disciplines in the future.

6. Conclusion

Engineering education is important for achieving sustainable development. The policy/ strategy, education, STI and partnership and collaboration are four interconnected main mechanisms for reaching SDGs. Thus, engineering education must be strategically planned so that it can help in reaching other SDGs. In this work, the relevance of educational strategic plan for SDGs is studied. As a case study, Myanmar NESP (2016-2021) is reviewed and intuitively analysed and then verified through a survey among heads of departments/ deans, teachers/ lecturers and students from fifteen different engineering universities. In the case of Myanmar NESP, the survey results prove that it enhances SDG-6, SDG-7, SDG-8, SDG-9, SDG-11, SDG-13, SDG-14, SDG-15 and SDG-17. Currently, for Myanmar case, awareness of SDGs in education environment is around 60% and about 40% of respondents have not known or even

have not heard. More than 95% of academics agree to include SD concept in engineering curricula. Finally, six potential recommendations are made for developing a national education strategic plan in the future.

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