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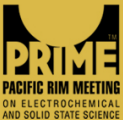
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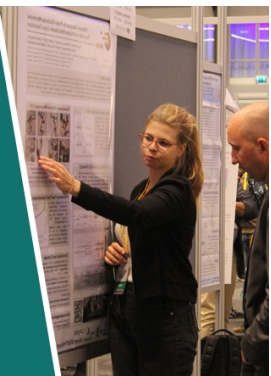
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Recent Trends and A Future Direction of Malaysia's Climate Change Law Program

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Abstract. Climate change is a critical global issue that is predominantly caused by human activities. To equip students in higher education institutions (HEIs) with the necessary knowledge and skills to play an active role in mitigating the effects of climate change, HEIs need to incorporate climate change-related programs into their teaching curricula. These programs should emphasize law and policy, enabling students to become environmentally aware and motivated to act. The Climate Change Institute (Institut Perubahan Iklim or IPI) at Universiti Kebangsaan Malaysia is among several (HEIs) in Malaysia offering a master's program in Climate Change (Coursework), with a specialization in Environmental Science and Earth Science. This paper aims to analyse the structure of existing climate change programs at both public and private HEIs in Malaysia. Desk research is conducted to gather various information from the available structures involving seven public universities and two private universities in Malaysia which offer 24 environmental-related programs both in undergraduate and postgraduate studies. The findings were analysed by a constant comparative approach that is guided by the key themes of the study. The finding shows that all universities that offer law programs do not have climate change postgraduate law programs offered at their faculties. Other faculties, should they have such a similar program, are more related to sciences, engineering, technology and management. This paper concludes by providing insights into the key features of recent trends in the offering of climate change postgraduate law programs in Malaysia. Accordingly, the findings of the study would serve as a significant guide for the development of any new climate change policy and law programs in the future in line with United Nation's Sustainable Development Goal SDG13 on climate action which focus on Target 13.3 in improving education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning. The new climate change postgraduate law program will also contribute to the sustainability of climate action, particularly in capacity building of the people on teaching delivery methods of climate change policy and



law, protecting the planet, promoting prosperity, maintaining peace and establishing connections and partnerships in the teaching methods, such as global learning.

1. Introduction

SDG13 on Climate Action requires members to take urgent action to combat climate change and its impact. To achieve this goal, Target 13.3 was enacted to improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning. The indicator is extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment. In 2021, despite 95% of teachers recognizing the importance of teaching about climate change severity, only one-third are capable of effectively explaining its effects in their region. Additionally, 70% of young people can only describe the broad principles of climate change in 2022 [1]. Progress in 2023 shows that for Target 13.3, an analysis of hundred national curriculum frameworks reveals that nearly half (47%) do not mention climate change [2].

Based on the above, it could be seen that the problem is low to moderate awareness and knowledge levels on climate change, albeit it is imperative for higher education institutions (HEIs) to incorporate comprehensive climate change-related programs into their curricula in order to equip students to actively contribute to the mitigation of climate change impacts.

Furthermore, these programs should also place special emphasis on law and policy, equipping students with the necessary knowledge and skills to become environmentally cognizant and action-oriented individuals. By engaging in this approach, HEIs can provide students with adequate comprehension of the legal and policy frameworks that govern climate change mitigation efforts by incorporating climate change-related programs into their curricula. This includes investigating international agreements, national laws, and regulatory mechanisms designed to address climate change challenges. Students can obtain a thorough understanding of the legal and policy dimensions of climate change, including the roles of governments, organizations, and individuals in implementing effective measures, by delving into these topics. Incorporating climate change-related programs into the curricula of higher education institutions encourages students' critical thinking and problem-solving abilities. By assessing real-world case studies, engaging in policy debates, and participating in simulation exercises, students are challenged to evaluate diverse perspectives, evaluate the efficacy of existing climate change policies, and propose novel solutions. This enhances their capacity to think critically, evaluate evidence, and make well-informed decisions, which are crucial skills for addressing the complex challenges posed by climate change.

Additionally, no past publication has ever pointed out the components of law and policy, science and technology and management courses being offered as formal education programs, which leads to the uncertainty of the effectiveness of the educational programs on climate change and environmental programs. This is the gap that this study is trying to address.

Accordingly, the objective of this paper is to analyses the structure of existing climate change programs at both public and private HEIs in Malaysia, with the aim that the findings would become a basis for the further planning of a new postgraduate program on climate change policy and law which is currently being developed and to be introduced by one higher learning institution in Malaysia.

This paper is divided into four main sections. Firstly, the paper provides an account of literature review on the key concepts engaged in the study. This is rightly significant for setting out the foundation for the investigated concepts of climate change, policy and law, science and technology and management aspects. The following section deliberates on the methodology undertaken in the study, followed by the third section on the results and discussion of the study. The final section concludes the paper by highlighting the key results of the study and proposing a few directions for future research in this area of research.

2. Literature Reviews

Climate change is long-term shifts in temperatures and weather patterns, that mainly caused by human activities. Even though the entire world is affected by climate change, previous studies suggests that the impact may be worse for poor country [3][4]. According to UN's Secretary-General's, "climate action is stalling on key fronts, and the poorest countries and people are being hardest hit. But no country is immune."

The consequences of climate change are diverse. It includes flash floods, intense droughts, water scarcity, severe fires, rising sea levels, melting polar ice, catastrophic storms, and declining biodiversity. Another notable impact of climate change is extreme pollution which necessitates appropriate legal sanctions [5]. In Nigeria for example, while temperature increased by 1.1°C for the 105 years, rainfall decreased by 81 mm [3]. In the context of Malaysia, different climate situations shape the water demands from the community, especially at highly populated areas and areas affected by extreme rain or extreme dryness [6]. In the latest development, catastrophic flood in Pakistan is an extreme example of the impact of climate change. The floods have washed away homes, killed over 1,000 people and affected millions of others. Apart from that, extreme landslides also impacted upon the community in hillsides and mountains, primarily caused by climate change actions [7]. Other than natural disaster, climate change also impacts cultural heritage assets such as historical buildings, archeological sites, and monuments, and their contents and collections [8]. Further, climate change may slow down the achievement of Sustainable Development Goal (SDG) 1 (No poverty), SDG 2 (No hunger) and SDG 3 (Good health) because it impacts the supply of food or food security [9]. Therefore, the mitigation of climate change should be the responsibility of each of us. People need to be educated well on the cause of climate change, how they contribute to the emissions of Green House Gases and what they can do to reduce the impact of climate change.

The law, whether international or domestic jurisdictions, acknowledges that climate change impacts will adversely affect fundamental human rights – which include the right to life, right to the fundamental conditions of life, liberty and security of the person, and the protection of indigenous lands and culture.

2.1 *Climate Change, Policy and Law*

Statistically, climate laws reduce yearly carbon dioxide emissions by an average of 0.8% in the first 3 years, and 1.8% in the longer term; and even some types of laws are better than others at reducing emissions. At the same time, they associated the implementation of the laws with the reduction of emissions where better implementation will cause more reduction of emissions [10]. Hence, proposed togetherness of all parties to create stronger laws to solve this global problem. While the laws have become the evidence for reducing emissions and impacts of climate change, they should become one of crucial components to be incorporated as part of education.

To address the challenge of climate change, other than needs to be a wholesale transformation of the economy [11], there also needs to be a wholesale transformation of law [12] that requires integration between policy, legislation, legal reasoning, and adjudicative decision-making [13]. In Malaysia, the National Policy on Climate Change was introduced in 2009. Following this, the government has announced the drafting of the National Climate Change Legal Framework leading to the Climate Change Act that is expected to be in force in 2024. All these show that climate change is inevitably associated with the policy and law of a country. This also has evidenced a nation-wide cross-sectoral approach for adaptation and mitigation measures thus ensuring climate-resilient development for achieving environmental sustainability.

2.2 *Climate Change and Education*

Education is a key in addressing climate change issues [2]. To study about climate change is about to prepare for the future. Education empowers all people, especially motivates the young to take action. It

can empower and motivates people, to encourage them to be aware, also change behaviour and attitudes towards environment. People, as agents of change, can get together, obtain information, involve in public participation, as well as to make informed decision through education. In the classroom, students can be taught the impact of global warming and learn how to adapt to climate change. A policy paper by the UK Foreign, Commonwealth and Development Office [14] highlights the power of education to help solving and reducing the impact of climate change and environmental crises. A research by North Carolina State University in 2019 shows that, dedicated education on climate change can help change behaviours which harm the environment across a population. Furthermore, a well-educated workforce is vital for the industrial revolution to tackle climate change [15].

Despite signatories to the 2015 Paris agreement agreeing to improve education around climate change, very few countries have put the commitment into action . Hence, international bodies are expecting climate change studies to be part of school curriculums where the UN anticipates the subject to be part of teaching by 2025 [16]. A study of education plans in nearly 50 countries by UNESCO showed that only 19 percent mentioned about biodiversity while the rest make no reference to climate change in their education. Be that as it may, there are countries that have started introducing climate change as education at schools. For example, in 2020, Cambodia has integrated climate change into their curriculum for higher secondary schools starting with 15 pilot schools that assigned with work projects such as tree planting and climate-smart agriculture. Moreover, parliament of Argentina in 2021, had approved a National Law of Comprehensive Environmental Education where environmental education is required to be taught in schools at all age levels.

As such, climate change is a subject that should not be ignored. As argued by Kwauk & Winthrop [17], more environmental awareness in schools will result in consumer behaviour changes, therefore, may reduce energy consumption and waste. In the context of climate change and legal education, Young [18] sees legal education and law have their important roles in mitigating climate change, thus examines ways where legal education can encourage ethical and moral evaluations as well as strategic awareness to ensure the law does not perpetuate inequalities and injustice within the community of states.

A survey conducted by Leal Filho et al. [19] toward representative of 45 developed and developing countries, the most commonly taught subjects in climate change related training were climate change mitigation and adaptation, as well as social and environmental impacts. Courses on environmental, social, and governance reporting, climate diplomacy, and climate leadership, as well as ICT-based courses, were among the least taught-through courses in training. Aside from that, roughly one-third of the sample identified future climate change projections, climate economics, and climate governance as topics that should be considered in educational program (Table 1).

Table 1: Aspects of climate change mostly addressed by courses taught by the respondent and their training needs [19]

Climate Change Aspects	Aspects of climate change mostly addressed by the courses taught (%)	Climate change related field where more training is needed (%)
Carbon cycle and climate-related aspects	29.5	21.7
Projections of future climate change	37.2	35.7
Climate change indicators	35.7	24.8
Climate change mitigation	58.1	14.7
Climate change adaptation	61.2	18.6
Social impacts of climate change	58.1	28.7
Environmental impacts of climate change	59.7	21.7
Economic impacts of climate change	38.8	30.2
Economics of climate change	22.5	37.2
Climate change solutions	41.1	29.5
Climate change policies	42.6	23.3
Behavioral and Lifestyle Changes	24.0	22.5
Sustainable Development Goal 13 – Climate Action	34.1	17.1
Climate smart practices	23.3	27.9
Climate leadership	11.6	26.4
Climate governance	21.7	32.6
Climate diplomacy	9.3	24.8
Sustainability reporting	14.7	27.9
ESG reporting	3.9	20.9

In Malaysia, example of a centre which related with climate change is an institute in Universiti Kebangsaan Malaysia (UKM) called Climate Change Institute or *Institut Perubahan Iklim (IPI)* that offers a Master in Climate Change (Coursework) with specialization on Environmental Science and Earth Science. According Molthan-Hill et al. [20], a climate change education programme should cover both climate change mitigation education and climate change adaptation education components in order to maximise climate action among students. There is less discussion in the literature on the percentage of course allocation between science, management, and technology. Besides the percentage of course allocation between science, management and technology, the primary focus of this paper is to examine the existing climate change related program in Malaysia and insert the legal and policy component as to make the climate change educational program more comprehensive.

3. Methodology

Desk research was conducted to gather some information from the available structure involving nine HEIs (seven public universities and two private universities) in Malaysia which offer 24 environmental-related programs both in undergraduate and postgraduate studies. The findings were analysed by a constant comparative approach that is guided by the key themes of the study, that is, name of the university, name of program offered, broad discipline of the program and percentage wise distribution area of study contained in the programs offered.

Focus Group Discussion (FGD) was also conducted with three main groups namely academics, experts and students to gain their opinions on existing climate change related programs and to seek their views on future directions for new climate change program in Malaysia. It involved five respondents from academics who teach environmental related subjects, two experts or industry practitioners whom one is practising environmental lawyer and another one is sustainability officer in international corporation, and three students who had taken environmental law as their elective paper during undergraduate study. The findings from FGD have been analysed using thematic analysis where specific themes has been identified either using deductive or inductive approaches, revolving around climate change education, as well as a feasible structure of climate change postgraduate program.

4. Results and Discussion

The results will be discussed in two sections; the first section discusses the recent trends based on the existing programs on climate change policy and law offered by HEIs, followed by the second section on the future directions of postgraduate programme in climate change policy and law.

4.1. Recent trends: Existing program offered by the HEIs.

Table 2 yields the existing programs and its broad discipline offered by nine HEIs. Generally, all HEIs offered environmental related programs which are more related to sciences, engineering, technology and management. For example, University Putra Malaysia have several related environmental programs that are offered at the master's level, but on different focus, such as Master of Science (Environmental Protection) and Master of Science in Food Security and Climate Change that focuses on agricultural and natural resources; Universiti Malaysia Sarawak, where the Faculty of Resource Science and Technology offers Master in Environmental Science (Land Use and Water Resource Management); An institute in Universiti Kebangsaan Malaysia called Climate Change Institute (IPI) offers a Master in Climate Change (Coursework) with specialization on Environmental Science and Earth Science; and Universiti Sains Malaysia, through the Centre for Global Sustainability Studies, offers MSc. (Sustainability).

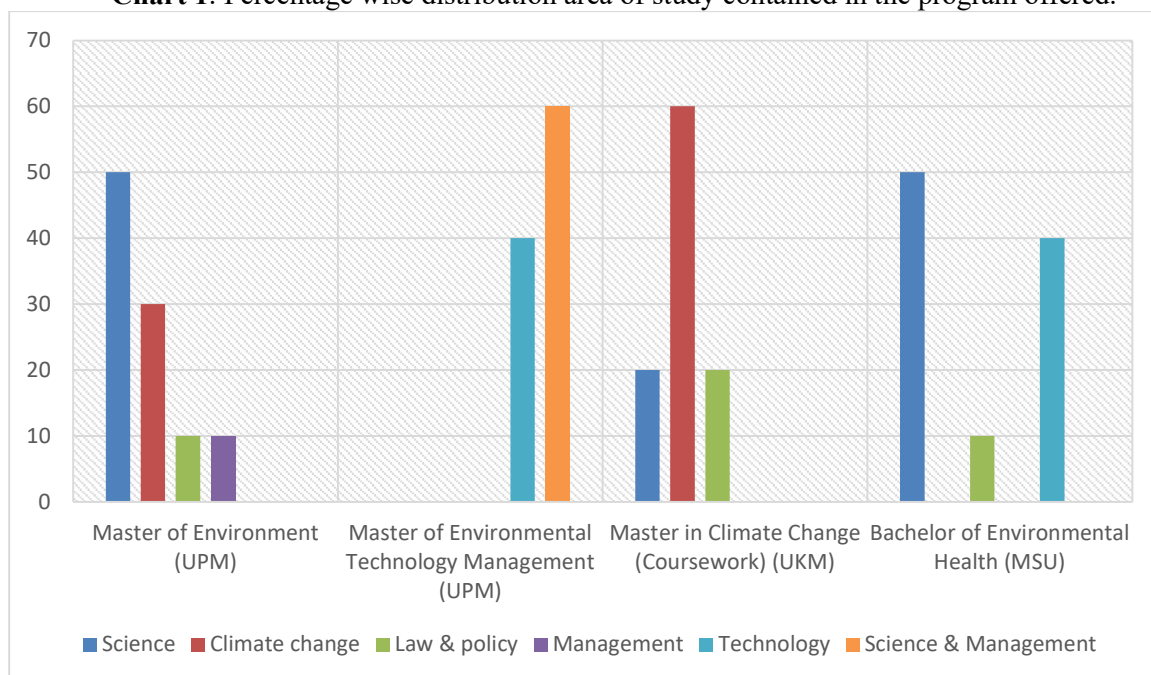
Table 2: Existing program offered by the HEIs.

No	University	Program	Broad discipline
1	Universiti Putra Malaysia/ Faculty of Forestry and Environment	1. Master of Environment 2. PhD	Science
	Universiti Putra Malaysia/ Faculty of Engineering	3. Bachelor of Environmental Sciences and Technology with honors 4. Bachelor of Environmental Management with honors 5. Master of Environmental Technology Management 6. Master of Environmental Engineering 7. Master of Science (Environmental Protection)	Engineering Technology Management
	Universiti Putra Malaysia/ School of Graduate Studies	8. Master of Sciences in Food Securities and Climate Change	Agricultural Natural Resources
2	Universiti Malaysia Sarawak/ Faculty of Social Science and Technology	9. Master in Environmental Science (Land Use and Water Resource Management)	
	Universiti Malaysia Sarawak/ Faculty of Engineering	10. Master in Environmental Management (Development Planning)	
3	Universiti Kebangsaan Malaysia/ Institut Perubahan Iklim	11. Master in Climate Change (coursework) 12. Master of Science (Research Mode) - 13. PhD	Policy Management science
4	Universiti Sains Malaysia/ Centre for Global Sustainability Studies	14. Master of Science (Sustainability) 15. PhD (Sustainability)	Sustainability
5	Universiti Malaysia Perlis	16. Bachelor of Environmental Engineering with honors 17. Master of Science Environmental Engineering 18. PhD in Environmental Engineering	Engineering
6	Universiti Malaysia Terengganu	19. Bachelor of Technology (Environment) with honors	Environmental protection

		20. Master of Science Environmental Technology and Management (Research)	
7	Universiti Teknologi MARA Malaysia/ Faculty of Applied Sciences	21. Bachelor of Science Environmental Technology (Honors) 22. Master of Science (Environmental Technology)	Environmental technology
8	Management and Science University/ Faculty of Health and Life Sciences	23. Bachelor of Environmental Health	Science Management
9	Sunway University	24. Master in Sustainable Development Management	Science Management

Chart 1 below shows the percentage wise distribution area of study among four programs in three HEIs. It reflects that Master of Environment offered by Universiti Putra Malaysia (UPM) is focusing more on science (50%) as compared to law and policy (10%); another program offered by UPM which is Master Environmental of Technology Management has zero component (0%) on policy and law; Master of Climate Change offered by Universiti Kebangsaan Malaysia (UKM) has 20% area of study on policy and law as compared to 60% on climate change; and Bachelor of Environmental Health offered by Management and Science University (MSU) focus 10% on policy and law as compared to more than 50% on science and management.

Chart 1: Percentage wise distribution area of study contained in the program offered.



4.2. Future directions

Findings from the focus group discussion shows that all respondents from academics, experts and students a climate change law and policy program is very relevant nowadays and therefore welcome the idea of introducing such a program at the postgraduate level. All academics and students who are from the law schools/faculties commented that so far, they are only familiar with environmental law as a subject that is made as an elective course at the universities. On that basis where the course will not be

able to cover everything that relates with environmental matters including climate change. One of the academics responded that she has come across the programme alike in India, LL.M in Environmental Law, Energy & Climate Change. As in Malaysia, she found one lacking common feature is the emphasis on public/climate litigation and empowering environmental lawyers. To her, there must be some initiatives to develop, foster and build interdisciplinary communities in respect of climate law. Also, one academic mentioned that the University of Singapore (NUS) once shared that they have one special course on climate change law, politics, United Nation framework, etc. where altogether, there were about nine topics covered as well as the Paris Agreement. Portion is a lot on the Paris Agreement, and also focuses on climate change litigation where, the ASEAN Research Institute on Environmental Law there, gives workshops on climate change litigation and focuses on policy in ASEAN countries.

All three groups of participants seem to agree that the new curriculum should contain major aspects of values, skills and experiential learning. Whilst experts from the industry practitioners and the academia opined there should be fair distribution among all three aspects, ranging between 30-40% for each aspect, the group of students were of the opinion that focus should be more to experiential learning (as much as 50-60%) as opposed to values and skills (20-25% each). This follows their reflections that the proposed new curricula major a topic which is more to technical and scientific, hence the field study or practical learning should be given emphasis so that students may learn more experientially on the field, rather than focusing on values and skills theoretically. In support of the opinion by the academic, one participant mentioned, *“It depends on what type of cohort we are taking in; would they be of LLB or non-LLB background. For non-LLB background students, then values, skills and substance of knowledge should be emphasized and come first.”* Similarly, one participant from the industry mentioned, *“We should focus more on interactive learning during classes, so as to equip the students with the necessary skills and values on the subject matter. Therefore, I view that the distribution should be 1/3 each for the components of values, skills and experiential learning.”* To the contrary, the students viewed that experiential learning should be the primary consideration, taking up as much as 50-60% of the proposed curricula. One student mentioned, *“By going for experiential learning, students would get more experiences from there, and benefit much from the program.”*

All participants unanimously agree that the components of the new curriculum should predominantly focus on law and policy (50-60%) followed by management (20-25%) and science and technology components (20-25%). This is motivated by the central focus of the curricular, that is. climate change law and policy. Table 3 shows among the feedback gathered from the participants in this regard.

Table 3: Responses from participants on components of new curriculum

Academia	“As this is LLM program, focus should be more on law and policy”
Industry practitioners	“If the name is LLM, it might attract more students from legal backgrounds – their career trajectory would be more to policy/legal.”
Students	“At the end of the day, law and policy would work together with management and science and technology, but focus is on law and technology”

Given the fact that the intended curricular is for postgraduate level, the teaching delivery for the program is expected to be more student-centred as opposed to teacher-centred. Adult learners at postgraduate level would appreciate more if the teaching and learning were interactive and revolved around problem-solving and real-world deliberations, as opposed to theoretical discussions. The respondents further agreed that the teaching delivery via face-to-face should be about the same method as remote learning. Additionally, the andragogy approach to be engaged in the delivery of the program is mixed between experiential learning and problem-solving. This is rightly suitable for postgraduate students who might have industry experience in the relevant fields of climate change and environmental law dominance. As

mentioned by an industry practitioner, *“After graduating, they would be engaged in organisations and become pioneers, they would be working on policies, technical, etc. They must have the courage to speak up, hence we need to prepare them with interactive learning and problem-solving.”*

Meanwhile, the assessment is proposed to be continuous assessment (60-70%) coupled with final assessment/examination (40-60%). Although the students and one industry practitioner reflected that emphasis should not be given for final examinations, given that the main focus should be to train the students with experiential learning, knowledge and substance of the subject matter is undeniably an important aspect for law and policy courses. Therefore, there is an option for Malaysian institutions to choose either 60:40 or 70:30 for continuous assessment: final examination. The continuous assessment component could consist of case study or article writing assignments, quiz or projects.

5. Conclusion

The desk research showed that other universities, though offer such related programs, their focus is not directly related to law and policy. In certain cases, they just have one or two courses related to law and policy, because their focus is more targeted towards sciences, technology, natural resources or engineering. These findings have been supported by FGD which claim that even the existing environmental law subject did not have a substantive component to discuss climate change.

The study found that a specialized program on climate change law and policy is much needed to create awareness on relevant national and international laws. Climate change has the potential to change the landscape of the world in many ways. In order to address risks emanating through climate change a specialized course. The global concern over the negative impacts of climate change will inevitably require experts to address the issues through pragmatic solutions. A specialized course will certainly help in creating such climate change experts. The convergence of sustainability and climate change issues requires an in-depth knowledge of domestic and international law. The application of these laws in a country (herein Malaysia) requires the know-how of local scientific and legal environment in conjunction with global developments. Also, corporate law firms require experts in climate change issues to balance commercial and environmental interests. Here, the climate change law and policy experts can fulfill the requirements of law firms and corporations.

Accordingly, based on the findings aforementioned, there are at least a few directions for future climate change postgraduate law programs in this regard. First and foremost, future studies could be carried out to include not only science, technology and management components but also climate change policy and law. Secondly, the andragogy approach should be by way of mixing experiential learning and problem-solving to gain more experience in the area of study. Thirdly, the method of delivery for the new climate change postgraduate law program should focus on student-centred rather than traditional lectures. Fourthly, the continuous assessment of the program should consist of case study or article writing assignments, quiz or projects to train the students with problem solving, knowledge and substance of the subject matter.

In conclusion, the above findings and recommendations would serve as a significant guide for the development of any new climate change policy and law programs in the future in line with United Nation's Sustainable Development Goal SDG13 on climate action which focus on Target 13.3 in improving education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning. The new climate change postgraduate law program will also contribute to the sustainability of climate action, particularly in capacity building of the people on teaching delivery methods of climate change policy and law, protecting the planet, promoting prosperity, maintaining peace and establishing connections and partnerships in the teaching methods, such as global learning.

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