United Nations Educational, Scientific and Cultural Organization

Office for Climate Education
UNDER THE AUSPICES OF UNESCO

GGAF
Green Growth Asia Foundation

The Capacity Building Workshop For STEM Teachers For Climate Change Education Through Inquiry Based Science Education (IBSE) Under The Eco-Schools Program

Programme Report

A Partnership Project between Office of Climate Change Education, Paris & Green Growth Asia Foundation

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1.0 Executive Summary

Problem Statement

With a population of over 30 million, Malaysia faces increasing threats from climate change, including erratic monsoons, glacial cap recession, heatwaves, floods, and droughts. Urgent attention is required to enhance community resilience through comprehensive climate change education, preparing citizens to make informed decisions regarding climate change. Integrating climate change education is vital for raising awareness, supporting evidence-based research, and promoting knowledge dissemination, which, in turn, is crucial for successful climate change mitigation and adaptation.

Proposed Solution

The proposed solution for improving climate change education in developing countries involves transitioning to an inquiry-based science education (IBSE) approach, beginning at the preschool level and extending throughout the education system. To address teacher shortages, a robust training program should be implemented, and investments in educational infrastructure are crucial to provide hands-on learning experiences. By emphasizing active student engagement, evidence-based learning, and teacher support, this approach aims to foster critical thinking, curiosity, and creativity while preparing students for the global knowledge economy and scientific advancement.

Overview

The workshop engaged a total of 77 participants, comprising 48 primary school teachers, 25 secondary school teachers, and 4 individuals from various professional backgrounds. In terms of the racial composition, the participants represented a diverse group with 48 Malays, 11 Chinese, 17 Indians, and 1 attendee from a different ethnic background. Remarkably, the workshop drew participants from 6 distinct states, including Kedah, Kuala Lumpur, Melaka, Pahang, Perak, and Selangor, demonstrating a wide geographic reach. Notably, a significant proportion of the attendees were science teachers, underlining the strong presence of educators with expertise in the field.

Therefore, this encourages the implementation of the Capacity Building Workshop on Climate Change Education Pedagogy Through Inquiry Based Science Education (IBSE) as follows:

8 - 13 October 2023

Officiate by
Yang Amat Mulia Tengku Puteri Raja Tengku Puteri Ilyana binti Al-Sultan Abdullah Ri'ayatuddin Al-Mustafa Billah Shah, SIMP

Institusi Latihan Pembangunan Kerajaan Tempatan (I-KPKT) Bukit Tinggi, Pahang Darul Makmur

Partners & Collaborators

The success of the Climate Change Education Workshop 2023 is made possible through collaborative efforts with several key partners and organizations committed to climate change education. These partners include prominent environmental nonprofits, leading educational institutions, governmental bodies, and sustainable technology companies. Some of the notable partners and collaborators include:

Office for Climate Education

The Office of Climate Education (OCE) is a center under the auspices of UNESCO and an observing member of the Intergovernmental Panel on Climate Change (IPCC), devoted to support teachers as well as education systems with education resources, professional development, expertise and implementation of local projects. The OCE will oversee the design and animation of the workshop.

Green Growth Asia Foundation

The Green Growth Asia Foundation is a non-profit organisation that provides a platform for leadership, thought and actionin responding to sustainability challenges in Asia. GGAF is taking a lead in promoting a new growth strategy that strikes a balance between economic development, social inclusivity and environmental sustainability. GGA will oversee the organization of the workshop (identification of the participants, communication, logistics…) as well as its funding. GGA will support the travel and accommodation expenses of OCE facilitators.

French embassy in Malaysia

The French embassy in Malaysia will provide funding and operational support for the OCE team , especially by supporting the travel expenses of 2 OCE facilitator.

Ministry of Education

The Ministry of Education (Malay: Kementerian Pendidikan) is a ministry of the Government of Malaysia that is responsible for education system, compulsory education, pre-tertiary education, technical and vocational education and training (TVET), curriculum standard, textbook, standardised test, language policy, translation, selective school, comprehensive school. MOE will support in providing approval for teachers to join the programme as well as disseminate the invitation to nationwide teachers to apply and join the workshop.

Amanah Lestari ALAM

Amanah Lestari Alam (ALAM) aims to foster partnership between private, public & global organisation to shift Malaysian's behaviour across generations for the planet's future. ALAM aims at creating public awareness and educating the public on environmental conservation as well as instilling a whistle blowing culture to deter environmental damaging acts. For this program, ALAM has provided sponsorship in the form of flight tickets for all facilitators from France and India.

Programme Objectives

Integration of Climate Change Topics in Teacher Education

One approach is to incorporate climate change topics into teacher education programs. For example, this can be done by including instruction on disaster risk reduction, planning, and policy implementation related to climate change.

This ensures that STEM (Science, Technology, Engineering, and Mathematics) teachers have a deep understanding and can effectively communicate the importance of climate change to students.

Enhancing STEM Teachers' Skills

STEM teachers need to be equipped with skills, understanding, and competencies in IBSE methodologies that enable them to effectively teach climate change science.

This can involve practical approaches and experiments in teaching and also providing students with opportunities to ask questions, conduct research, and collaborate on climate change-related projects.

Strong Teaching Framework for STEM Teachers

Providing a robust teaching framework for STEM teachers is crucial. This framework should assist teachers in designing relevant and engaging lessons on climate change. It includes the provision of teaching materials, lesson plans, and appropriate assessment methods that align with the IBSE approach and climate education goals.

A robust teaching framework for STEM teachers empowers them to deliver high-quality education on climate change.

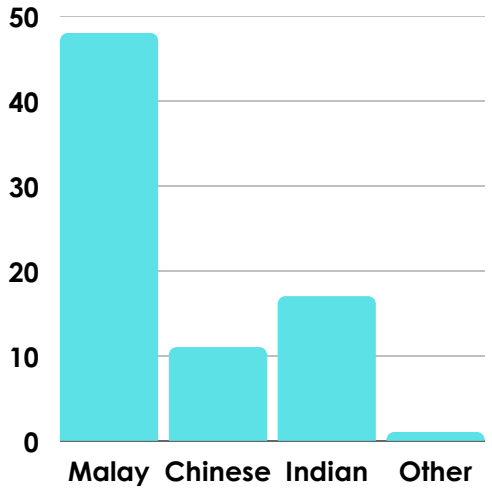
Participants Satisfaction Overview

The summary of participant feedback indicates that a significant majority of attendees have expressed their positive sentiments about the Inquiry-Based Science Education (IBSE) training organized by the Green Growth Asia Foundation and others significance partners. Participants overwhelmingly conveyed their love, enjoyment, and satisfaction with the training.

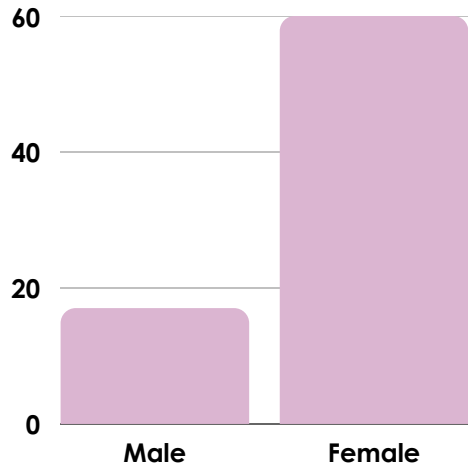
The feedback reflects a high level of contentment and enthusiasm, suggesting that the program has been successful in meeting the expectations and needs of the participants, fostering a strong sense of appreciation for the Green Growth Asia Foundation's efforts in delivering effective science education.

2.0 Participants Demographic

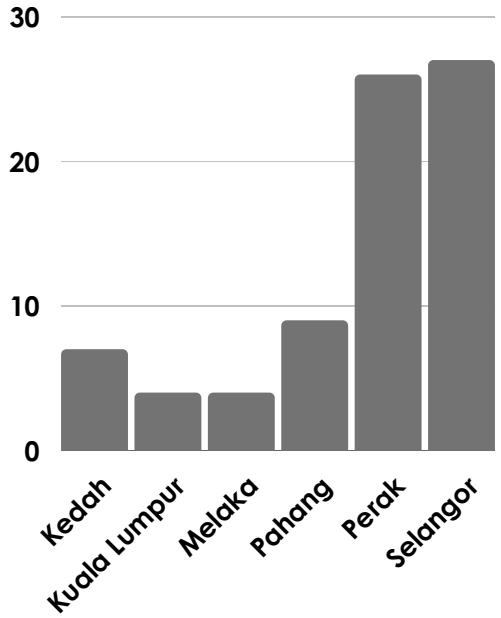
Race



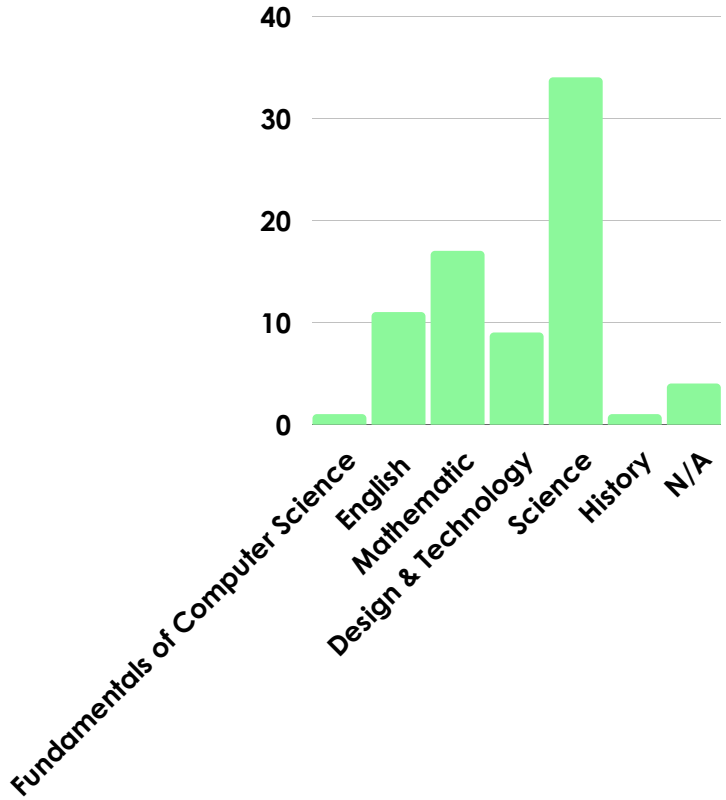
Gender



State



Teacher's Subject Option



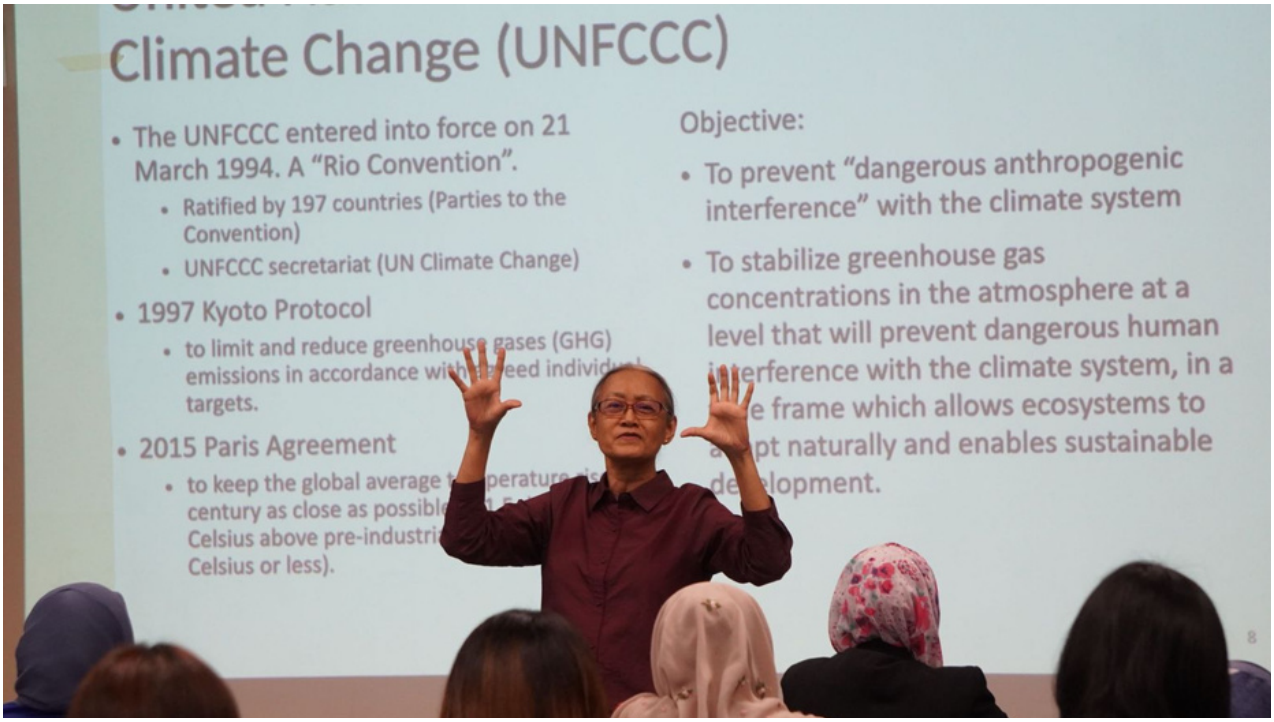
3.0 Program Highlights

Highlights #1 Inauguration Ceremony Officiated by YAM Tengku Puteri Raja Tengku Puteri Ilyana, Royal Patron of Eco-Schools Pahang

A formal inauguration photograph capturing all the participants alongside Yang Amat Mulia Tengku Puteri Raja Tengku Puteri Ilyana binti Al-Sultan Abdullah Ri'ayatuddin Al-Mustafa Billah Shah, SIMP together with other VVIPs

A formal photograph of the I-KPKT staff with Yang Amat Mulia Tengku Puteri Raja Tengku Puteri Ilyana binti Al-Sultan Abdullah Ri'ayatuddin Al-Mustafa Billah Shah, SIMP

A formal photograph of the main organizer; GGAF, partners, and sponsors with Yang Amat Mulia Tengku Puteri Raja Tengku Puteri Ilyana binti Al-Sultan Abdullah Ri'ayatuddin Al-Mustafa Billah Shah, SIMP



The workshop commenced with a thought-provoking session led by Dr. Zelina, who delved into the IPCC findings and their intricate connections with the specific nuances of climate change within our local context

We hold the deep conviction that the enthusiasm and dedication of the teachers who participate in this workshop represent invaluable assets for the education sector of our nation

Highlights #2: 5-Day IBSE Workshop Training

Performing a straightforward experiment to illustrate how heat can be retained in the ocean —an embodiment of simplicity at its finest. Such an approach promises to be highly advantageous for classroom instruction, greatly benefiting the students

Office for Climate Education (OCE) trainers from left Dr. Adeline Aroskay, Mr Nicholas Vogt and Dr. Apurva Barve

Conveying the concept of greenhouse gases ensnared within our planet, as a fundamental concept for elucidating Climate Change within the classroom, is pivotal

Mr. Wan Ahmad Azimi bin Wan Azmin, an enthusiastic educator from SMK Tanjong Sepat, Selangor, is deeply dedicated to igniting awareness about climate change

Mr. Nicholas Vogt consistently demonstrates unwavering commitment, delivers content with creativity, and fosters engaging discussions at every moment

Each passing second unfolds as a unique learning opportunity for the participants, and it is our privilege to treasure every moment of this educational journey

Highlights #3: Closing & Certificates GivingCeremony

Capture the essence of togetherness and achievement with a group photo from the closing ceremony.

The closing ceremony was officiated by Mr. Arman Bin Mohamad Tojid, Head of the Co-Curricular Unit, Student Development Sector, Pahang State Education Department, on behalf of YB. Dato' Sri Ir. Haji Mohd Soffi Bin Tan Sri Abd. Razak, Pahang State Executive Councillor for Agriculture, Agro-based Industry, Biotechnology and Education

The celebration signified the conclusion of the workshop, yet it also serves as the dawn of a new chapter in our Climate Change Education era

4.0 Post-Program Analysis

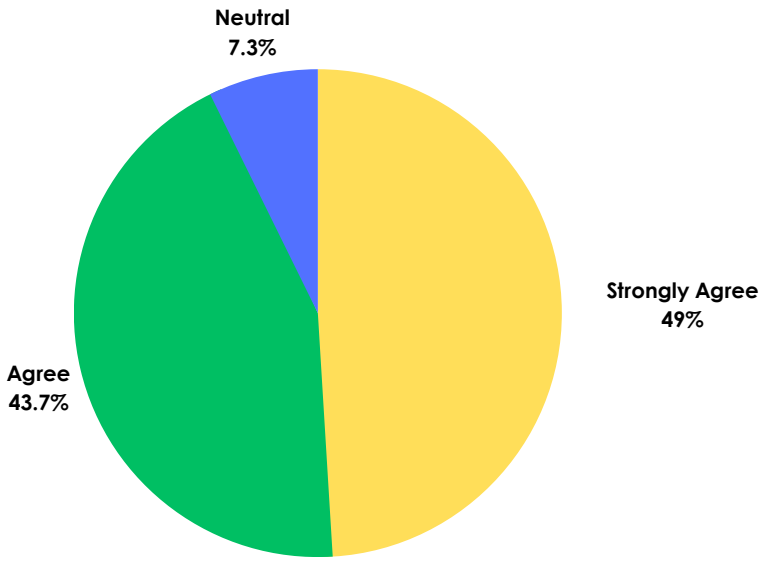
A 5-Day Post-Programme feedback had been collected among participants in this "Capacity Building Workshop For STEM Teachers for Climate Change Education Through Inquiry-Based Science Education (IBSE)" under the Eco-Schools Program.

Overall, we had received at least 207 responses, making it at least 41 responses per day on average per day. Here are the highlights of our data collection.

Highlights #1 "Clarity and Simplicity in Content Delivery"

Chart indicates that in a survey or assessment involving a group of participants, 49% of them expressed a strong agreement with the assertion that the training materials or contents were clear and easy to comprehend. I

In other words, nearly half of the participants found the content to be straightforward and easily digestible.

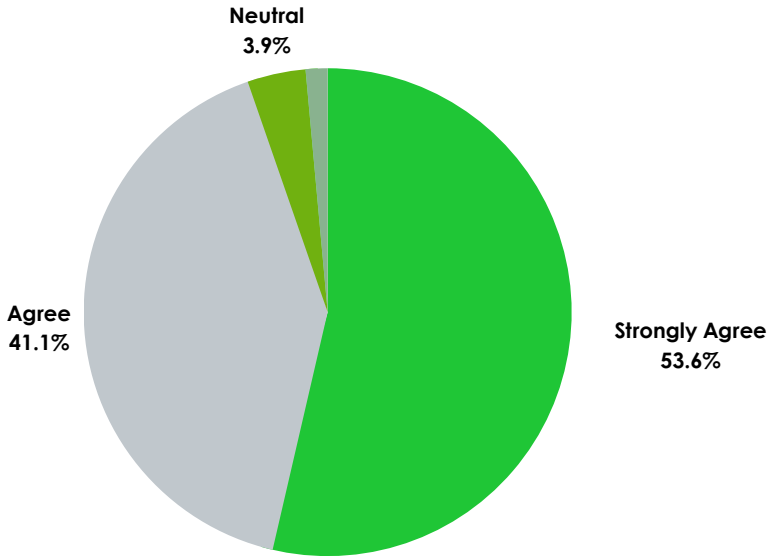


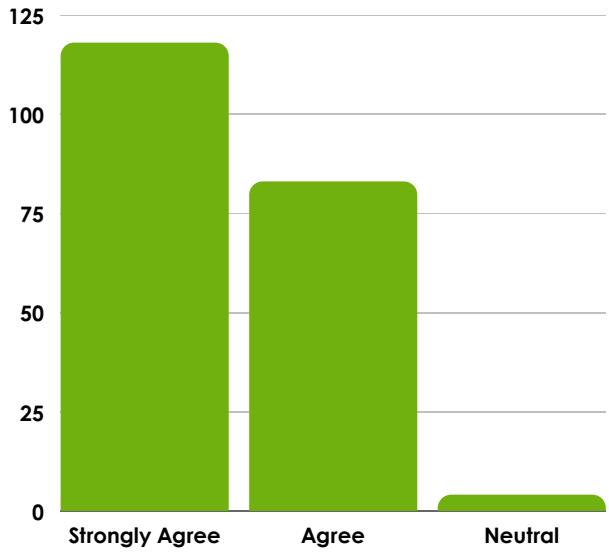
Highlights #2 "Empowering Learning Through the Classroom Environment"

This statistic reveals that slightly more than half, specifically 53.6%, of the participants or respondents provided affirmative feedback.

Most of participants expressed a a strong agreement with the idea that the class environment, including aspects such as the physical classroom, teaching methods, and interactions with instructors and peers, played a significant role in enabling their learning.

In other words, these individuals found the classroom environment to be conducive to their educational growth and understanding.

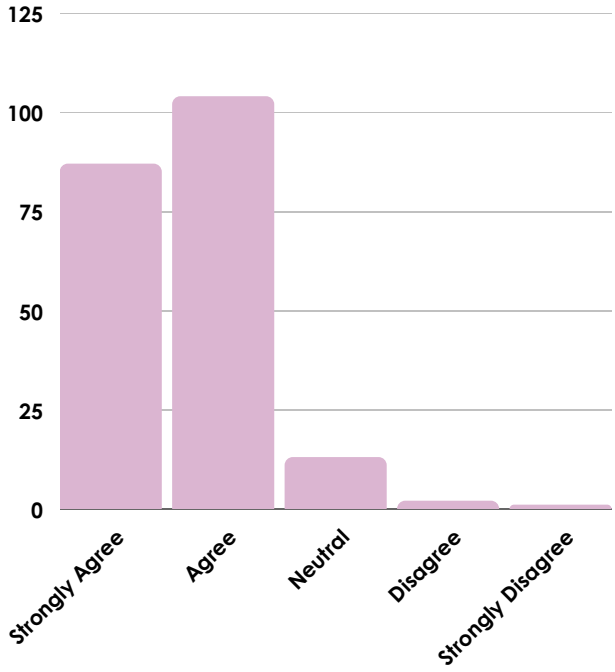




Highlights #3 "Exploring New Horizons: Training's Impact on Knowledge and Practices"

This statistic indicates that a significant majority of the participants, specifically 57.6%, responded affirmatively to the statement, signifying that they strongly agreed with the idea that the IBSE training program had effectively introduced them to new knowledge and practices in the field of science education.

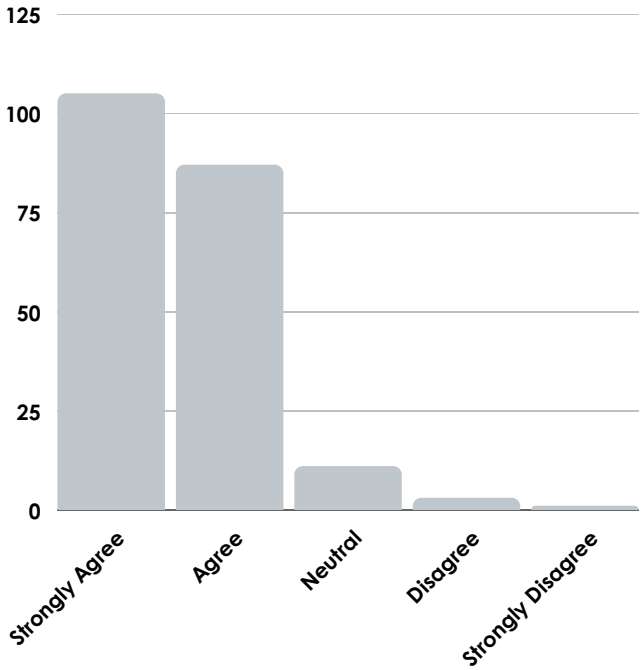
This feedback reflects their perception that the training program was successful in broadening their understanding and imparting new methods and practices within the context of science education.



Highlights #4 "Applying Knowledge: A Clear Understanding of Learning Outcomes"

This statistic indicates that slightly more than half of the participants, specifically 50.2%, expressed agreement with the statement. This suggests that they believe the IBSE training program was effective in providing them with the knowledge and skills necessary to understand how to apply what they've learned in practical scenarios.

In other words, these participants feel confident in their ability to take what they've gained from the training and put it into practice.



Highlights #5 "Highly Recommended: A Course for Colleagues"

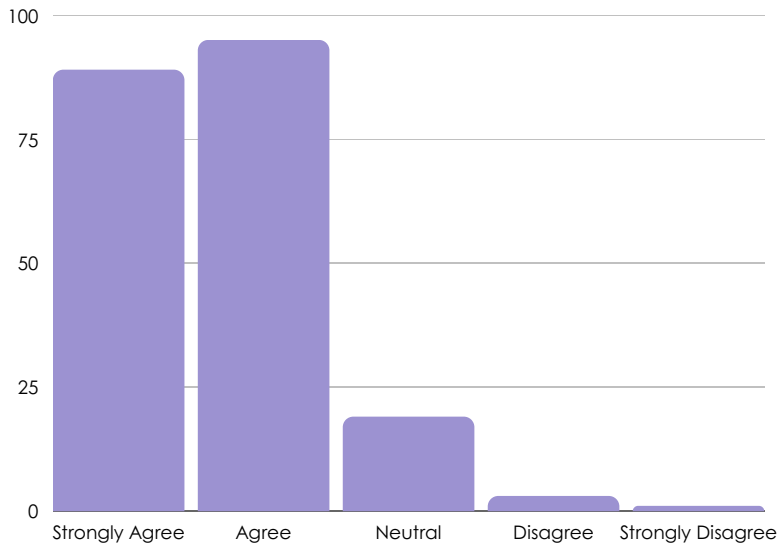
This statistic reveals that just over half, specifically 50.7%, of the participants expressed strong agreement with the idea of recommending the IBSE training program to their colleagues.

It indicates that this group not only found value in the training but also felt strongly about its quality and potential benefits for others in their professional network.

Highlights #6 "Effective Time Allocation: Experiment Implementation in Training"

This statistic indicates that approximately 45.9% of the participants agreed with the idea that the IBSE training program provided them with sufficient time to effectively conduct and complete the experiments as part of their learning experience.

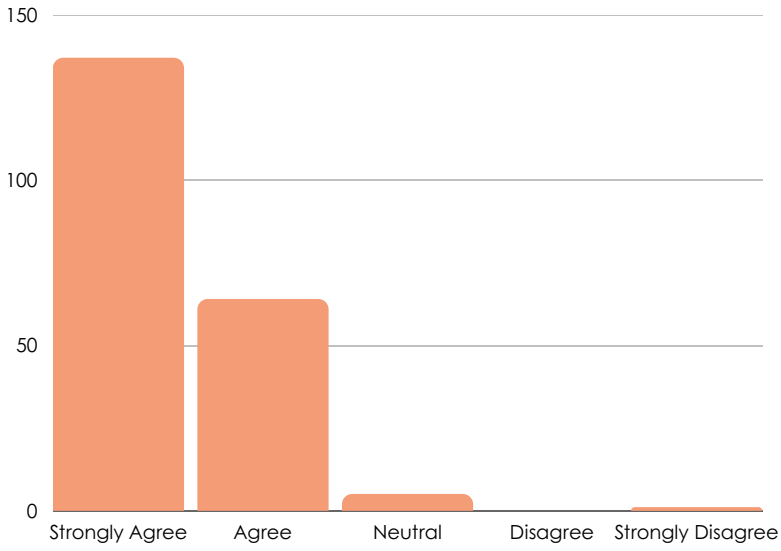
In other words, these participants found the allocated time for experimentation to be reasonable and adequate.



Highlights #7 "Exceptional Support: Praise for the Helpful Staff/Secretariats"

This statistic indicates that a significant majority, specifically 66.2%, of the participants strongly agreed with the assertion that the staff and secretariats involved in the IBSE training were highly helpful.

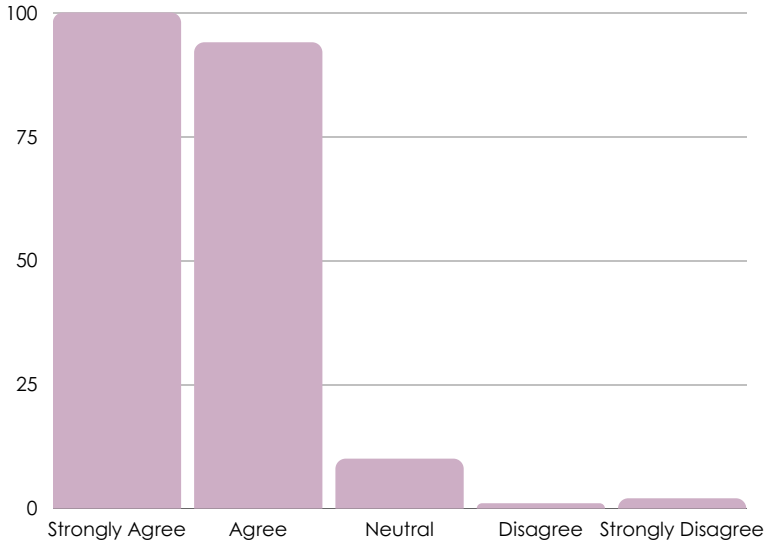
This strong agreement signifies that these participants found the support and assistance provided by the staff and secretariats to be exceptionally effective and valuable.



Highlights #8 "Active Participation: Trainer's Engagement Rate"

This statistic indicates that approximately 48.3% of the participants agreed with the statement that they were effectively engaged during the training sessions led by the trainer.

It reflects their perception that the trainer successfully promoted active involvement and participation during the training.



Highlights #9 "Rating Networking Satisfaction: Participants Feedback on Overall Programme"

In order to validate participants' comments, specifically on their satisfaction with the program, a word cloud has been generated, and in this case, the two dominant words in the word cloud are "good" and "satisfied," indicating a consistent sentiment of contentment and approval among the participants regarding the IBSE training program. It suggests that a significant number of participants have expressed positive feedback about their experience with the IBSE training.

Highlights #10 "Highlighting Course Preferences: Participants Favorite Aspects"

The word "experiment" being the most frequently mentioned term in the word cloud indicates that participants have consistently expressed their enjoyment and appreciation for this specific activity within the IBSE training program. It suggests that participants find the hands-on, practical aspect of conducting experiments to be a highlight of their experience with IBSE training.

6.0 Expenses Summary

ITEM	DESCRIPTION	UNIT	NO. OF UNIT	PRICE PER UNIT (RM)	INCURRED EXPENSES (RM)
LODGING					
Housekeeping	Single Bed	Bed	89	27.56	2452.84
	Queen Bed	Bed	15	32.86	492.9
	Queen Bed (Perdana)	Bed	1	37.10	37.10
Total Expenses					2,982.84
TRANSPORTATION					
Participant Travelling	Bus (Perak)	Bus	1	3,800.00	3,800.00
	Bus (Selangor)	Bus	1	1,400.00	1,400.00
	Bus ticket (Melaka)	Ticket	3	34.35	103.05
	Car (Pahang)	km	2088.8	0.85	1775.48
Trainers Travelling	Taxi (Grab)	Car	1	227.03	227.03
	Flight Ticket	Ticket	3	3,700.00	11,100.00
Staff Travelling	Car (Pahang)	km	422	0.70	295.40
	Car Rental	Car	2	225.25	450.50
	Bus (Ipoh - Kedah)	Ticket	2	25.25	50.50
Total Expenses					19,202.96
WORKSHOP AND TRAINING					
Class and Experiment Material	Apparatus and Stationery	Package	1	795.64	795.64
Total Expenses					795.64
OPENING AND CLOSING CEREMONY					
Opening Ceremony	Backdrop Opening	Pcs	1	1,600.00	1,600.00
	Backdrop Replacement	Pcs	1	900.00	900.00
	Meals VVIP (Santapan Diraja)	Pax	8	80.00	720.00
	Meals (Petugas)	Pax	110	5.00	550.00
	Meals (Guest +Participant)	Pax	200	25.00	5,000
	Banquet Chair Cover	Pcs	200	3.00	600.00
	Banquet Table Cloth	Pcs	25	15.00	375.00
Closing Ceremony	Frame + Certificate	Pax	83	7.19	596.77
Total Expenses					10,341.77
MEALS					
Meals	Breakfast x 5 days	Pax	104	37.50	3,900.00
	Brunch x 4 days	Pax	104	16.00	1,664.00
	Lunch x 4 days	Pax	104	48.00	4,992.00
	Tea/Coffee Break x 5 days	Pax	104	20.00	2,080.00
	Dinner x 5 days	Pax	104	60.00	6,240.00
Total Expenses					18,876.00
EMERGENCY EXPENSES					
Trainer Meals	Lunch	Pax	1	92.00	92.00
Lodging	Transit from Ipoh to Sg.Petani	Room	1	121.90	121.90
Medication	Paracetamol and Cough Syrup	Pcs	1	51.23	51.23
Total Expenses					265.13
Total Programme Expenses					**52,464.34**

7.0 Conclusion

In the face of escalating climate change challenges, Malaysia's recognition of the urgent need for comprehensive climate change education serves as a beacon of hope and determination. With a population exceeding 30 million, this nation stands at the forefront of a battle against increasingly severe climate-related events. The erratic monsoons, receding glacial caps, heatwaves, floods, and droughts are formidable adversaries, and they demand immediate attention and action. Malaysia's commitment to enhancing community resilience through climate change education is a testament to its dedication to forging a sustainable and informed path forward.

This endeavor is not solely about addressing today's challenges; it is about preparing future generations to tackle the pressing global issues that lie ahead. Recognizing the pivotal role of climate change education in navigating a changing world, especially in the context of climate change, Malaysia's emphasis on integrating climate change education is a crucial step. By fostering awareness, supporting evidence-based research, and promoting knowledge dissemination, the nation is laying the foundation for informed decision-making and effective mitigation strategies.

As we look toward the future, we understand that successful mitigation and adaptation to climate change depend on a policy framework deeply rooted in scientific research and rational judgment. Malaysia's approach highlights the significance of equipping young minds with the essential scientific knowledge and skills required to safeguard our planet. Investing in the education of children and youth is not just an imperative; it is an act of hope for a brighter and more sustainable future.

The proposed solution of transitioning to an inquiry-based science education (IBSE) approach starting as early as preschool carries the promise of transformative change. By encouraging active student engagement in inquiry and discovery, this approach nurtures cognitive development, curiosity, and creativity among students. Shifting away from rote memorization toward experiential learning ignites a genuine passion for science. Moreover, by investing in teacher training and modern educational infrastructure, we are empowering educators to guide our youth effectively. The focus on inquiry, evidence-based learning, and technology integration sets the stage for preparing future generations to meet the demands of a rapidly evolving global knowledge economy and contribute to scientific progress.

In this commitment to climate change education, Malaysia is fostering a generation of young minds eager to explore, innovate, and tackle the challenges of tomorrow. It is this dedication to the education of our children and youth that fuels hope, determination, and the belief that, armed with knowledge and a passion for science, they will be the stewards of a more sustainable, resilient, and informed world. It is in the hearts and minds of these young individuals that the future of our planet lies, and we have every reason to be hopeful for the better world they are poised to create.

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