



Regional Seminar on Good Practices in Linking Nuclear Science Technology (NST) into Secondary Education

RAS0091-EVT2302446

29 Oct to 2 Nov 2023

Muscat, Oman

The Regional Seminar on Good Practices in Integrating Nuclear Science and Technology (NST) into Secondary Education, organized by the IAEA Technical Cooperation in Asia and the Pacific in collaboration with the Ministry of Education Oman, is designed to address key challenges in teaching and learning NST among secondary school students. This inaugural seminar aims to engage Project Counterparts, Secondary Teachers, Nuclear Science Institutions, Curriculum Developers, and Ministry of Education Officials responsible for Secondary Education.

These participants bring substantive expertise to the table, acquired through specialized training, which they have since applied either within the classroom or through co-curricular and extra-curricular activities focused on NST topics. Their efforts have yielded impressive results and valuable lessons. Importantly, they have significantly contributed to enhancing students' learning experiences, both within and beyond the confines of traditional classrooms.

The seminar includes keynote talk(s), expert presentations on nuclear science and technology, presentations, active discussions, demonstrations, poster sessions and focused workshops. With the theme "Promoting NST Awareness in Secondary Education Across Asia-Pacific," it aims to empower secondary educators to enhance NST teaching skills, fostering greater awareness and understanding.

The areas covered are:

1. Strategic partnership to support good governance
2. Linking NST with the school curriculum
3. Co-curriculum Activities
4. Teaching strategies and learning facilitation tools
5. Assessment, Monitoring and Evaluation.

Objective: To showcase and discuss effective practices in secondary education programs that incorporate nuclear science and technology, and to deliberate on and finalize the strategic action plan for the region at the secondary education level.

Expected Outputs:

- a. Finalized the guidebook series of sustainable good practices for the integration of NST, along with a strategy for building teacher's skills towards facilitating learning on NST topics in a sustained manner.
- b. Formulated a consensus-driven strategic action plan aimed at advancing the objective of reaching 10 million students by 2025.

Provisional Programme

Sunday, 29 October 2023

Session Chair: OMA (TBC)

Rapporteurs: Mr Musa Muhammad, Brunei & Ms Syrille Glen Batingal, Philippines

Time	Session	Speaker
8:45 – 9:30	<i>Learning Session: Fundamentals of Nuclear Science</i>	TBC
	<i>Rapporteurs Meeting</i>	Ms Bridget Carter & Mr Mohd Hafiz Zin
9:30-10:00	Session 1.1. Welcome and Opening Session <ul style="list-style-type: none">Welcoming and opening remarks from the Chair of the SeminarWelcoming remarks from the Ministry of Education OmanProgramme overview and introduction to the seminar objective themes	Dr Maya Al-Azri, Director of Innovation and Scientific Olympics Department, Ministry of Education, Oman Ministry of Education, Oman TC Division for Asia and the Pacific (TCAP), IAEA
10:00-10:30	<i>Coffee/Tea Break</i>	
10:30-11:15	Keynote Speech	IAEA
	Session 1.2. Current Progress of NST Education at Secondary Level in Asia and the Pacific 1.2.2 Asian Network for Education in Nuclear Technology (ANENT) Strategic Activities 1.2.3 Piloting the International Nuclear Science Olympiad (INSO) in Asia and the Pacific region	Ms Ana Elena Conjares, Chair of ANENT Dr Maya Al-Azri, Chair of INSO
11:15-12:30	Session 1.3. Member States Perspectives: Strategic Partnership to Support Good Governance 1.3.1. Promoting Nuclear Science & Technology Education in Schools through Innovative Approaches: Sri Lanka Perspectives 1.3.2. Science Teacher Academy for the Regions: Fostering Partnership, Empowering STEM Educators in the Philippines	*Each talk is 10 minutes Ms Rajakulasuriyage Perera, Sri Lanka Ms April Dumayag, Philippines

	<p>1.3.3. Promoting Nuclear Science Education for Sustainable Development: Capacity Building of Educators and Collaborative Initiatives in Jordan</p> <p>1.3.4. Incorporation of Nuclear Science Technology in the New Secondary Education System in Myanmar</p> <p>1.3.5. Teaching Practices of Omani Teachers in Promoting Peaceful Nuclear Science and Technology: Reality and Ambition</p> <p>1.3.6 Nuclear Science and Technology Education in Nepal: Initiatives and Future Pathways</p> <p>Q&A and Discussion</p>	<p>Ms. Shefa' Abbaas, Jordan</p> <p>Ms Khin Cho Win, Myanmar</p> <p>Ms Khadija Al Balushi, Oman</p> <p>Mr Shyam Prasad Acharya, Nepal</p>
12:30-14:00	<i>Lunch Break</i>	
14:00-15:30	<p>Session 1.4. Roles of Stakeholders in Supporting NST Education</p> <p>1.4.1 IAEA nuclear knowledge management in supporting member states</p> <p>1.4.2 US Support and Lessons Learned in Promoting NST Education</p> <p>1.4.3 Asian Network for Education in Nuclear Technology (ANENT) network activities in Korea and the importance of strategic partnership</p> <p>1.4.4 Accommodating NST Education to the CoVid19 Paradigm Shift</p> <p>Q&A and Discussion on Strategic Partnership <i>(a. Sharing experiences and challenges faced by project counterparts, teachers, and representatives from institutions</i> <i>b. Exploring opportunities for collaboration and support in enhancing NST education)</i></p>	<p>*Each talk is 10 minutes</p> <p>Ms Alesia Iunikova, Knowledge Management Specialist, Department of Nuclear Energy, IAEA</p> <p>Mr Shayan Shahbazi, Argonne National Laboratory, USA</p> <p>Dr Youngmi Nam, Korea Atomic Energy Research Institute, Republic of Korea</p> <p>Mr Nasaai Masngut, Malaysia</p> <p>Ms Anita Abdul Rahman - Facilitator</p>
15:30-16:00	<i>Coffee/Tea Break</i>	
16:00-17:00	<p>Demonstration Session TBC (Teaching Tools, Survey Meters etc)</p>	

Monday, 30 October 2023

Session Chair: Ms Alesia Lunikova, IAEA

Rapporteurs: Mr Suo Yue, China & Ms Norzamzarina binti Arifin, Malaysia

Time	Session	Speaker
8:45 – 9:30	<i>Learning Session:</i> <i>Bruneian Secondary Science Teachers' understanding of nuclear energy</i> <i>Lecture on Nuclear Energy and Power Generation</i>	Ms Hardimah Said, University Brunei Darussalam Mr Shahbazi, Argonne National Laboratory, US
9:30 - 10:30	Session 2.1. NST Curriculum 2.1.1 Nuclear Science components in secondary education across Asia and the Pacific region 2.1.2 Outreach Activities to Secondary Education Using the Kindai University Reactor 2.1.4 Nuclear Science Olympiad Curriculum and Sample Problems Q&A and Discussion	Ms Anita Abdul Rahman, University Putra Malaysia Mr Genichiro Wakabayashi, Atomic Energy Research Institute, Kindai University, Japan Prof Amanur Rehman, Head of INSO International Juries
10:30-11:00	<i>Coffee/Tea Break</i>	
11:00-12:30	Session 2.2. Linking NST with the school curriculum: Member States Experience 2.2.1. Bridging the Gap: Integrating Nuclear Science and Technology into the School Curriculum in Malaysia 2.2.2. Nuclear Science Technology in Brunei Darussalam's Secondary Education 2.2.3. Best Practices of peaceful Nuclear Science Technology Integration with Secondary School Curriculum 2.2.4. Linking NST with the Science Curriculum 2.2.5. Curricula development in the Syrian Arab Republic 2.2.6. Current Status and Initiative of Introducing NST activities in Saudi Arabia Schools Q&A and Discussion	*Each talk is 10 minutes Ms Siti Aisyah Sahdan, Malaysia Mr Andery Lim, Brunei Darussalam Mr Younis Nasser Salim Al Shidhani, Oman Ms Egoda Gamage Teleshia Permarathne, Sri Lanka Ms Nadia Alghazouli, Syrian Arab Republic Mr Anas Alwafi, Saudi Arabia

13:00-14:00	<i>Lunch Break</i>	
14:00-15:30	<p>Session 2.3. Monitoring and Assessment</p> <p>2.3.1 The Level of Knowledge and Awareness of the STEM Students in Santa Rosa Science and Technology High School on Nuclear Science and Technology: Basis for Special Program Towards NST Curriculum Implementation</p> <p>2.3.2. Exploring science teachers' knowledge on nuclear science through the teaching components of nature of science (NOS)</p> <p>2.3.3 Essential Knowledge Prerequisites for Nuclear Physics Educators</p> <p>2.3.4 Fostering Nuclear Science and Technology in Education Through Innovative Approaches Towards Assessment, Monitoring and Evaluation</p> <p>2.3.5 Empowering Secondary Education Through Science Olympiads and STEM Activities in Nuclear Science and Technology</p> <p>2.3.6 Unveiling the Atom: A Deep Dive into Brunei's Secondary Science Textbooks on Nuclear Science Technology</p> <p>2.3.7 Development of online Learning Hub for Learning Intervention, Advancement and Linking Learners to Nuclear Science Technology</p> <p>Q&A and Discussion</p>	<p>*Each talk is 10 minutes</p> <p>Mr Mike Angelo Borromeo Estopace, Philippines</p> <p>Ms Marlizayati Johari, Brunei</p> <p>Mr Monthery Al-Monthery, Oman</p> <p>Ms Tanzeela Yaqoob, Pakistan</p> <p>Mr Abdallah Al Marhoune, UAE</p> <p>Ms Roslinawati Roslan, Brunei</p> <p>Mr Joesel D. Dariagan, Philippines</p>
15:00-15:30	<i>Coffee/Tea Break in parallel with Poster Viewing and Demonstration Session</i>	
15:00-17:00	<p>Demonstration Session (In Parallel)</p> <ol style="list-style-type: none"> 3D Virtual Reality-Based Laboratory (EON) where experiments can be designed and performed by the students/ Educational Platforms on which lessons are presented. Charge-up! Filling gaps in NST education Kahoot platform as an assessment tool 	<p>Mr Jankly Mimas, Syria</p> <p>Ms Mary Joy Demausa, Philippines</p> <p>Ms V Mulatunga, Sri Lanka</p>

Tuesday, 31 October 2023

Session Chair: Ms Ana Elena Conjares, ANENT Chair

Rapporteurs: Mr Muhtadan, Indonesia & Ms Cheri Anne Dingle, Philippines

Time	Session	Speaker
8:45 – 9:30	<i>Learning Session: Radiation in Medicine and Healthcare Introducing Medical Physics through Outreach Programme</i>	Ms Anita Abdul Rahman, Universiti Putra Malaysia Mr Mohd Hafiz Zin, University Sains Malaysia
9:30-10:30	Session 3.2 Teaching strategies 3.2.1. Talk on Importance of Teaching Strategies 3.2.2. Nuclear Science Education in the Era of the Fourth Industrial Revolution 3.2.3. Fostering Nuclear Science Technology in Princess Chulabhorn Science High School of Thailand Through Active Learning Approaches 3.2.4 Humanizing Nuclear Science Education through Co-curricular Development Q&A and Discussion	*Each talk is 10 minutes Mr. John Domyancich, ANL Mr Khalifa Al-Azri, Oman Mr Poramet Charoynoot, Thailand Mr Vui Ket Kuit, Malaysia
10:30-11:00	<i>Coffee/Tea Break</i>	
11:00-12:30	Session 3.3. Learning Facilitation tool 3.3.1. Teaching nuclear science in a fun and engaging way 3.3.2. Incorporating technology into teaching 3.3.3. Game-Based Learning as a Pedagogical Approach in Delivering Nuclear Science Technology for Secondary School 3.3.4. United in Nuclear, Thriving through Innovation 3.3.5 Mishkat's Experience in Communicating the Concepts of Nuclear Sciences at Young Ages 3.3.6 Presenting Project-based Learning strategy (PPBL) Q&A and Discussion	*Each talk is 10 minutes Ms Salmah Binti Ibrahim, Malaysia Mr Ghanashyam Yadav, Nepal Mr Noradzahar bin Hussaini, Malaysia Ms Ying Gao, China Ms Nora Alshaiki, Saudi Arabia Ms Asila Said Salim Said Al-Mazidi
12:30-14:00	<i>Lunch Break</i>	

14:00-15:30	Session 3.4. Innovative/Online learning
	<p>3.4.1. Latest Strong Japanese Activity on Supporting Promotion of Radiation Education Based on Web-Information Platform "RADI" Prof Takeshi Iimoto, University of Tokyo, Japan</p> <p>*Each talk is 10 minutes</p> <p>3.4.2. Empowering Secondary Education: Utilizing LMS Technology for Basic Nuclear Science and Technology (NST) in the National Independent Learning Curriculum Ms Dhita Ariyanti, Indonesia</p> <p>3.4.3. Simulating the Real Experiments of the NST Topics Using the Octave Software as an Alternative of Using Real Sources Mr. Hamood Salim Said Hamed Al-Shidhani, Oman</p> <p>3.4.4. The Smart Book on Nuclear Science & Technology for Secondary Students Ms Chamika Rathnaweera, Sri Lanka</p> <p>3.4.5. Utilizing Video as an Effective Teaching Strategy: Enhancing Learning and Engagement Across NST Topics Ms Nasa Said Mabrokk Bait Saleem, Oman</p> <p>Q&A and Discussion</p>
15:30-16:00	<i>Coffee/Tea Break in parallel with Poster Viewing and Demonstration Session</i>
15:30-17:00	Demonstration Session (in parallel in 3 corners) <p>1. 7E-Learning Cycle Strategy in Teaching Nuclear Physics Ms Fatma Al-Shukeili, Oman</p> <p>2. Employing Artificial Intelligence Techniques for NST topics in High Education Ms Rahma Mohamed Hilal AL Sabri, Oman</p> <p>3. R2R: Giving Students a Voice on the Debate Surrounding the Suitability of a Nuclear Power Plant for Malaysia Mr Marcus Khoo Hiok Tian</p>

Wednesday, 1 November 2023

Session Chair: Mr John Domyancich, USA

Rapporteurs: Mr Chris Patron, Philippines and Ms Ayu Puspitasari, Indonesia

Time	Session	Speaker
8:45 – 9:30	<i>Learning Session: Application of Radiation in Food, Agriculture and Industry</i>	Mr Swapan Kumar Chakraborty, Bangladesh Atomic Energy Commission
9:30-10:30	Session 4.1 Assessing Progress and Achievements 4.1.1 Achievements in the Second Year of RAS0091 – Secondary Education Section 4.1.2. IAEA NST Education & Exhibition Competition 4.1.3 Strategy for building teacher’s skills towards facilitating learning on NST topics in sustained manner Q&A and Discussion	Ms Nadia Babaei, Iran Ms Bridget Carter, IAEA Ms Marina Mishar, Section Head & PMO RAS0091
10:30-11:00	<i>Coffee/Tea Break</i>	
11:00-12:30	Session 4.2. Co-curriculum activities 4.2.1. Module CAP: An Education Partnership Strategy that connects school curriculum with co-curriculum 4.2.2. Measurement of Natural Radioactivity 4.2.3. Co-curricular Developments: Sustainable Solution for Inculcation of Nuclear Science and Technology in Secondary Education to Achieve United Nations Sustainable Development Goals (UN-SDGs) 4.2.4. Nuclear Science at PSHS 4.2.5. Educational Workshop and Comprehensive National Student Nuclear Technology Competition Q&A and Discussion	*Each talk is 10 minutes Ms Haziemah Harun, Malaysia Mr Myagmarjav Odsuren, Mongolia Mr Muhammad Maqsood, Pakistan Ms Liza-Fe Gallamaso, Philippines Mr Seyed Mohammad Fatemi, Iran, Islamic Republic of
13:00-14:00	<i>Lunch Break</i>	

14:00-14:30	Session 4.3 Testimony from the Youth 4.3.1 International Youth Nuclear Group (IYNG) 4.3.2 My journey from a student to Marie-Curie Fellow to Nuclear Power Designer to now 4.3.3 Remain motivated as Nuclear Advocate	Ms Kristen Maden, IAEA - <i>virtual</i> Ms Wang Xiaoluo, China – virtual Ms Nicole Angela Ramos, Philippines
14:30-15:30	<i>Parallel sessions (3 sessions)</i> Session 4.4a Working Group on Linking NST to Curriculum and Co-Curricular and Extra-Curricular Activities Session 4.4b Working Group on Teaching and Learning Strategies Session 4.4c Working Group on Monitoring, Assessment and Evaluation	Ms Anita Abdul Rahman - coordinator Ms Bridget Carter, Prof Iimoto & Mr Abdallah AlMarhoune Mr John Domyancich & Mr G Wakabayasi Mr Mohd Hafiz Zin & Ms Youngmi Nam
15:30-16:00	<i>Coffee/Tea Break</i>	
15:30-17:00	Group Discussion of NST Education Survey Meeting of Session Chairs and Rapporteurs	Dr Anita Rahman, Malaysia Ms Bridget Carter, Mr Mohd Hafiz Zin

Thursday, 2 November 2023

Session Chair: Ms Marina binti Mishar, IAEA

Rapporteurs: 1-2 teachers (to be nominated and assigned)

Time	Session	Speaker
8:45 – 9:30	<i>Learning Session: Application of Radiation in Arts and Archaeology</i>	Ms Bridget Carter, International Atomic Energy Agency
9:30-10:30	Session 5.1 Summary session – reports from track co-chair/repertoire	Session Chairs Day 1-4
10:30-11:00	<i>Coffee/Tea Break</i>	
11:00-13:00	Session 5.2 Endorsement on Agreed Action Plan to contribute to the goal of reaching 10 million students.	Session Chair
	Session 5.3 Endorsement on Strategy for building teacher’s skills towards facilitating learning on NST topics in a sustained manner	Session Chair
	Session 5.4 Call for Organiser: NST Education Regional Seminar 2025	Session Chair
13:00-14:00	<i>Lunch Break</i>	
14:00-15:30	Session 5.5: Summary and Way Forward	Ms Marina Mishar, SH TCAP, IAEA
	Session 5.6 Closing Remarks by IAEA	Ms Jane, Gerardo-Abaya, DIR TCAP, IAEA
	Session 5.7 Closing Remarks by Chair	Dr Maya Al-Azri, Oman

Posters

Theme	Title	Presenter	Country
1.Strategic partnership to support good governance	1. Nuclear Science and Technology Education: Bangladesh Perspective	Swapan Kumar Chakraborty	Bangladesh
	2. The work in progress to link NST with secondary school curriculum in Syria	Muhammad Hassan Obeid	Syrian Arab Republic
	3. JVET Activities Achievements and Significance	Rieko Takaki	Japan
2. Linking NST with the school curriculum	4. NST Curriculum Development and Teaching Tools in Jordan	Omar Abu Ghalyoun	Jordan
	5. Status of Atomic Energy and Nuclear Science in Secondary Science Curriculum in Nepal	Lav Dev Bhatta	Nepal
	6. Introduce Nuclear Science Technology into The Senior Secondary Curriculum in Sri Lanka.	Vipula Kulathunga, Sri Lanka	Sri Lanka
3. Co-curriculum Development	7. Introducing medical physics through outreach programmes	Hafiz Zin	Malaysia
4.Teaching strategies and learning facilitation tools	8. Supports to Secondary Education by Sending NST Experts to Schools and Developing Information Website "Ene Hyakka"	Noriaki Sakai	Japan
	9. The Application of Radiation Detection in order to Implementing Good Practices in Linking Nuclear Science Technology into Secondary Education Applications at Nuclear Instrumentation Laboratory	Risky Nurseila Karthika	Indonesia
	10. One..Two.. Action!: Role-Playing Method as a Teaching Strategy to Inculcate the Learning of Nuclear Science Technology	Norzamzarina Binti Ariffin	Malaysia
	11. the Use of Learners Guided Activity Sheets (L-GAS) in Improving the Academic Performance of Grade 10 Learners	Chris Patron	Philippines
	12. Fear to Fascination: Breaking the Stereotypes of Nuclear Science Technology (NST) and Promoting its Benefit for Society and the Environment through Curriculum Design and Evaluation	Syrille Glenn Batingal	Philippines
	13. Development and Educational Application of Cloud Chambers Targeting Each General Level	Takehiro Toda	Japan
	14. Teaching strategies in Linking Nuclear Science Technology (NST) into Secondary Education	Saeed Mohammadi	Iran
5.Assessment, Monitoring and Evaluation	15. Utility Standards for Evaluating Quality Assurance in University	Aye Aye Thant	Myanmar