



# **Final Project Report**

## **REPORT ON REIMAGINING A STEM RESEARCH CULTURE:**

## LESSONS LEARNED FROM 20 YEARS OF EVOLUTION FOR INCLUSIVE REPRESENTATION IN SCIENCE AND ENGINEERING

# Asia Pacific Nations Network

Moderator

Ariunbolor Purvee

APNN Chair person

2022

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## WORKSHOP SUMMARY REPORT

Workshop details	
Name of region	APNN
Date and time	The first webinar was held on May 7, 2022 3:00-5:00 AM in UTC via Zoom
	The second webinar will be held on May 21, 2022 3:00-5:00 AM in UTC via Zoom
Type of workshop (dialogue/knowledge sharing)	Speaking and knowledge sharing
Lead organiser name and title	Women in science, technology, engineering and mathematics in Mongolia (WSTEM)
Lead organiser contact email	ariunbolor976@gmail.com
	ariunbolor.purvee@inwes.net
IT person contact email	Boldoonibna@gmail.com
	bold.enkhbold@inwes.net

Summary information		
Number of attendees	Webinar 1:	
	Registrants: 81	
	Participants: 32	
	Webinar 2	
	Registrants: 101	
	Participants: 36	





List of nations	Marlene Kanga, Engineers Australia	
represented	Siddika Sultana, Women in Science and Engineering in	
	Bangladesh	
	Seema Singh, Women in Science and Engineering in India	
	Ryo Kimura, Japan Network of Women Engineers and Scientists	
	Dr. Seongjin Ju, Association of Korean Women Scientists & Engineers	
	Noorfaizah Hamzah, The Institution of Engineers Malaysia	
	Enkhtuul Sharavdemberel, Women in Science, Technology,	
	Engineering, and Mathematics	
	Khin Sandar Tun (Chair) Women Engineer Chapter	
	Federation of Myanmar Engineering Societies	
	Jun Hada, Women in Science and Engineering in Nepal	
	Bridgit Sissons, Institution of Professional Engineers New Zealand	
	Durdana Habi, Women in Science and Engineering in	
	Pakistan	
	Emily Tan, Association of Women in Construction	
	Vishaka Hidellage, Women in Science and Engineering in	
	SriLanka	
	Maan-Yuh Lin, Taiwan Women in Science and Technology	
	Le Thị Hop, Vietnam Association for Intellectual Women	
	Juana Tapel, Philippine Technological Council	

Contributors					
Saturday, May 7, 2022	Saturday, May 7, 2022 3:00-5:00 AM in UTC via Zoom				
Chair / moderator	Dr. Ariunbolor Purvee, APNN Chair person				
Presenters	Dr. Leong Wai Yie, Board member of INWES Dr. Seema Singh, Board member of INWES Dr. Ryo Kimura, Chair of JNWES				
Panellists	Dr. Leong Wai Yie, Board member of INWES Dr. Seema Singh, Board member of INWES Dr. Ryo Kimura, Chair of JNWES				
Other contributors	Dr. Jung Sun Kim, President of INWES				
Saturday, May 21, 2022 3:00-5:00 AM in UTC via Zoom					
Chair / moderator	Dr. Ariunbolor Purvee, APNN Chair person				
Presenters	Dr. Anya Maan-Yuh Lin, Taiwan Women in Science and Technology (TWIST) Dr. Le Minh Thang, Vietnam Association for Intellectual Women, VAFIW Mrs. Hishigdulam Tumurbaataryn, Women in STEM Mongolia				





Panellists	
	Dr. Anya Maan-Yuh Lin, Taiwan Women in Science and Technology (TWIST) Dr. Le Minh Thang, Vietnam Association for Intellectual Women, VAFIW Mrs. Hishigdulam Tumurbaataryn, Women in STEM Mongolia
Other contributors	Dr. Jung Sun Kim, President of INWES





151	Webinar of IN	NWES Asia	Pacific Nations Network	
Nº	Time	Duration	Action	Members
1.	11:00-11:02	5 min	Welcome and introductions of speakers	Dr. Ariunbolor Purvee, APNN Chair
2.	11:02-11:07	5 min	Introduction to the project	Dr. Jung Sun Kim President of INWES
3.	11:07-11:17	20 min	MyRA: Performance Indicators for the Advancement and Evolution of Malaysian STEM Research – A More Inclusive Approach	Dr. Leong Wai Yie, Board member of INWES
4.	11:17-11:27	20 min	Enhancing Research Culture in STEM Tertiary Education in India	Dr. Seema Singh, Board member of INWES
5.	11:27-11:37	20 min	Overcoming the wall of "unconscious bias"	Dr. Ryo Kimura, Chair of JNWES
6.	11:37-12:07	17 min	Discussions	All speakers
7	12:07:12:10	3 min	Closing remarks	Dr. Áriunbolor Purvee, APNN Chair
eco	nd Webinar of	Asia Pacific	Nations Network	
N⁰	Time	Duration	Action	Members
1.	11:00-11:05	5 min	Welcome and introductions of speakers	Dr. Ariunbolor Purvee, APNN Chair
2.	11:05-11:15	10 min	Introduction to the project	Dr. Jung Sun Kim President of INWES
3.	11:15-11:35	20 min	Enhancing research culture of Taiwan for Gender equality: "Wow~ This is so called Gender in Science and Technology (GiST)	Dr. Anya Maan-Yuh Lin, Taiwan Women in Science and Technology (TWIST)
4.	11:35-11:55	20 min	Raising STEM passion for students, especially female students	Dr. Le Minh Thang, Vietnam Association for Intellectual Women, VAFIW
5.	11:55-12:15	20 min	Mongolia's scientific journey in the past 100 years	Mrs. Hishigdulam Tumurbaataryn, Womer in STEM Mongolia
	10 15 10 55	40 min	Discussions	All speakers
6.	12:15-12:55	40 mm	Discussions	Anopeaners





## Report



Ms. RYO KIMURA, JNWES Japan Network of Women Engineers and Scientists Abstract: Why is Japan, a developed country, continuing to be sluggish with a gender gap ranking of 120th? From there, the actual situation of Japanese girls' education can be seen. What is needed to break out of the low rankings that have lasted more than 20 years? In the case of Japan, even if education, funding, society, etc. are all at a higher level than in other countries, but we cannot get out of the gender gap of the STEM society for a long time. One of the causes is "unconscious bias". Japan has nurtured a unique historical culture for a long time. Although it is the pride and culture of the Japanese, but they have created a special unconscious bias in the women's STEM world. Recently, although the number of women in the Japanese STEM industry is visibly increasing, it is still insufficient in Japan, where the birth-rate is declining and the population is aging. In the case of Japan, the correction of unconscious bias is considered to be a major key to the development of women's STEM world.

Dr. Seema Singh, INWES Board member, Women in Science and Engineering | WISE India Abstract: Though tertiary education is supposed to perform three functions i.e. knowledge creation (research), dissemination of knowledge (teaching) and extension of knowledge, however, the Indian STEM education system was mainly performing second work. Even the Indian market was protected and thus, less competition for domestic producers. However, after liberalization and the opening up of the economy during the 1990s, the market has become very competitive. Producers are continuously improving technological inputs to survive in the market. Even the educational sector has also become very competitive. They have to comply with the various national and international ranking systems and accreditation programmes in which research has been given imporatnce. All these have enhanced the significance of research in the STEM tertiary sector. In this background, various measures which have been taken for enhancing research are below:

- 1. Sponsored projects
- 2. Various national and international research competitions for students through corporate houses
- 3. Increase in number of PhD students
- 4. Cash awards for publishing in reputed journals
- 5. Hackathon on important themes for engineering students
- 6. Students' research competition organised by professional bodies and

7. Even the research funding may be done as a Corporate Social Responsibility Activity

Dr Leong Wai Yie, INWES Board member, IET Industry Revolution Malaysia Abstract: This study explores the performance indicators for the advancement and evolution of STEM research in terms of innovation, funding and publication in Malaysia, for last 20 years. STEM Research in institutions of higher learning has always been valued for its

years. STEM Research in institutions of higher learning has always been valued for its contribution to global. STEM Research has been globally acknowledged for being a catalyst to develop the knowledge economy and society. The onset of Malaysian research was in the 1980s. Quality research is of utmost importance to achieve excellence in academic advancement, where it can be evaluated through research funding, post graduate supervision, publications, citations and intellectual properties (IPs). Publications in first quartile (Q1) journals or high impact publications and citations are quick indicators as they reflect international recognition. The number of citations generated measures a successful publications. In Malaysia, the main criteria for an establishment of a Research University (RU) are publications with impact factor (IF) journals followed by external research funding. In Malaysia, all universities are required to do annual self-assessment based the Malaysian





Research Assessment tool (MyRA). MyRA, a research achievement over five years.



Funding, principal investigator or research project leader and publications are several of the main performance indicators in MyRA. This study explores the growth of STEM research in terms of funding and publication in Malaysia. Information for STEM research funding is derived from the government agencies and from the universities involved. For publication output analysis, data from established publication online databases such as Scopus (2012), ISI Web of Knowledge (2012) and SCImago (2012) are analyzed and evaluated. The study aims to prove an overall upward trend to reimaging STEM research in Malaysia, to be more inclusive and diversity.

Prof. Dr. Anya Maan-Yuh Lin, The Society of Taiwan Women in Science and Technology (TWiST) :

Abstract: Gender equity was advocated by Women's Awakening foundation, a grassroots non-government organization (NGO) since 1987. After 10-year evidence-based advocacy, the government finally formed the Women's Rights committee at highest administrative level in 1997. In the following year, a foundation of Women's Rights promotion and development was registered to implement gender actions with government supports. Following the same track, women key opinion leaders in STEM started to introduce the trend in gender mainstream in the National Science Council (current name as Ministry of Science & Technology, MOST) in 2001. In our country, several proactive NGOs related with STEM are influenced by global gender mainstream, including Women in Nuclear Global established in 1994, Working group on Women in Physics & Chemistry in 2001, as well as The Society of Taiwan Women in Science and Technology (TWIST) in 2011

### Ms. Khishigdulam Tumurbaataryn, WSTEM in Mongolia

This presentation discusses the social impact of science governance, particularly stakeholders' engagement as decisive impact factors taking Mongolia as a case. Human intellectual and social evolution stimulate the process of knowledge (re)creation and systematic dissemination, which varies in the outcome. Advancing in knowledge management Mongols once built the most extensive empire in human history. The role of knowledge remains to safeguard Mongolia's sovereignty and contribute to current regional and global development. Since its independence in 1921, Mongolia commenced a contemporary academic institution building journey offering free compulsory education to the public, establishing the Literary Institute (Academy of Science), training young professionals internationally and beginning national tertiary education in 1945. The primary task of the Mongolian academic community remains to enlighten the public, explore tangible and intangible resources, and create and disseminate knowledge by partnering with international scholars. The nature of research project funding altered after the 1990s democratic revolution, but the shift to alternative financial resources progresses slowly. The scarcity of financial resources for research projects constrains academic fairness and competitiveness, negatively impacting the quality of research. In recent years, internationally trained Mongolian scholars, especially natural scientists, have introduced new culture by hosting multi-party funded projects, intensively publishing in IF journals, and contracting recognized publishers.

### Dr. Le Minh Thang, Vietnam Association for Intellectual Women

Abstract: Hanoi University of Science and Technology is one of the biggest Vietnam engineering university that educates about 40.000 students each year, most of them are male students. One of the aims of the university is raising science and technology passion for students and pupils at high school, especially encouraging female students to join engineering field. Hanoi University of Science and Technology branch of Vietnam Association for Intellectual Women understands deeply this wish and also aims the same





since this is a group of women lecturer who are also successful engineers. Thus, since established in 2020, our group has focused on the activities toward guiding and raising



STEM knowledge for students at the university and pupils at high schools. A visiting tour with doing simple experiments in different technology fields such as chemistry, electronics, electrical technology, mechanics was given for pupils. This activity attracts a lot of pupils both male and female to participate. They were curious and excited with new experiments that they've never known before. Moreover, our group has organized a series of public lectures performed by the member of the group about different areas in engineering. These lectures are planed once a month in livestream about many technological and engineering topics such as AI, air pollution, computer vision, fashion and life, etc... Each lecture attracts about 700 views, which is a beginning step to raise STEM passion for students, especially female students since all of speakers are beautiful and successful women engineers at Hanoi University of Science and Technology.

## Resources

https://www.youtube.com/watch?v=CIMoK0ALrYw https://www.youtube.com/watch?v=2Vt9OidCFnw&t=1393s

### **Further actions**

During the two webinars, these were the main obstacles and approaches identified by women in STEM fields, from Asian-Pacific countries:

• Recognizing unconscious bias and educating decision-makers about this problem

- Enhancing the university research culture, to include more women
- Improving performance indicators for women's advancement
- Exposing gender inequalities in textbooks, and written academic

communications • Working to get young girls excited in STEM fields

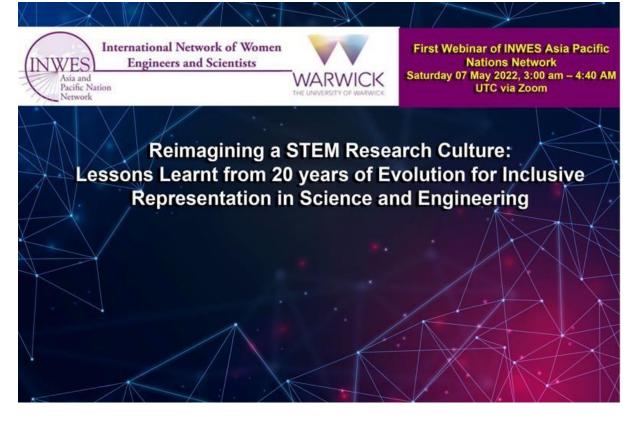
Across all countries involved, decision-makers have been exposed to this information, including adult men, whose positions are most likely to be threatened by change and inclusiveness. The only population that has yet to be exposed to the inequalities faces is young boys. Therefore, in addition to the approaches currently in use (exposing adult men and women to the situation with data, proof, country comparisons of policies and practices, pointing out unconscious bias at play, and evidence in written communications), a future activity could include a follow-on project among these AsianPacific countries wherein each could implement, in their own cultural contexts, ways to incorporate messages of equality in STEM education, to the next generation. This focus on youth would require careful planning, funding, and assistance from Australian, British, and Canadian women's groups in STEM fields, to learn from their own experiences working with youths, not necessarily in the classroom. Invited speakers, extracurricular activities, clubs, and other youth group activities that reinforce the idea of equality in STEM fields could be designed and offered. These follow-on activities would be in addition to continuing to present data, factual information, and suggested policy changes related to women in STEM fields, to each country's current decision-makers.





Appendix 1: Presentations of the first and second webinars attached in email Appendix 2: Group photo of the first and second webinars Appendix 3: Banner of the first and second webinars Appendix 4: Emails of announcement Appendix 5: Brief introduction of Speakers Appendix 6: Emails registrations of the first and second webinars

Appendix 1a: Presentations of the first webinar (only the first two slides are shown here and the rest are attached in the same email sent to this report)









ASIA PACIFIC NATIONS		AGENDA	WARWY The Development of
TIME	Duration	TITLE	Speakers
11:00-11:05	5 min	Welcome and introductions of speakers	Dr. Ariunbolor Purvee, APNN Chair
11:05-11:10	5 min	Introduction to the project	Dr. Jung Sun Kim, President of INWES
11:10-11:30	20 min	MyRA: Performance Indicators for the Advancement and Evolution of Malaysian STEM Research – A More Inclusive Approach	Dr. Leong Wai Yie, Board member of INWES
11:30-11:50	20 min	Enhancing Research Culture in STEM Tertiary Education in India	Dr. Seema Singh, Board member of INWES
11:50-12:10	20 min	Overcoming the wall of "unconscious bias"	Dr. Ryo Kimura, Chair of JNWES
12:10-12:27	17 min	Discussions	All speakers
12:27:12:30	3 min	Closing remarks	Dr. Ariunbolor Purvee, APNN Chair
Content Here	90 min	Three topics	Three invited speakers







Appendix 1b: Presentations of the second webinar (only the first two slides are shown here and the rest are attached in the same email sent to this report)





## REIMAGINING A STEM RESEARCH CULTURE



## AGENDA

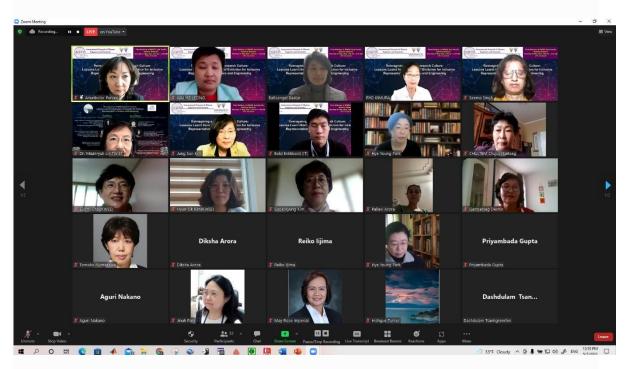
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11:55-12:15	20 min	Mongolia's scientific journey in the past 100 years	Mrs. Hishigdulam Tumurbaataryn, Womer in STEM Mongolia
12:15-12:55	40 min	Discussions	All speakers
12:55:13:10	15 min	Announcement APNN 2022 in Malaysia Closing remarks	Dr. Ariunbolor Purvee, APNN Chair
Content Here	120 min	Three topics, Discussion and Announcement	Three invited speakers

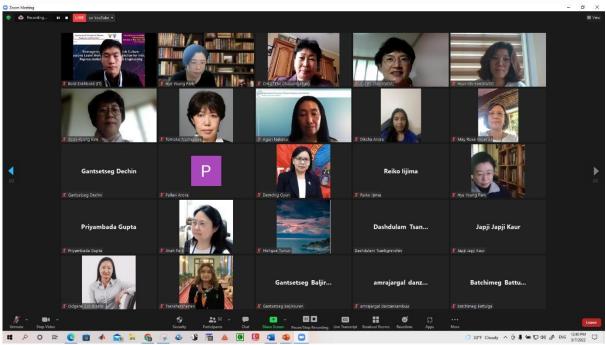






## Appendix 2a: Group photo of the first webinar

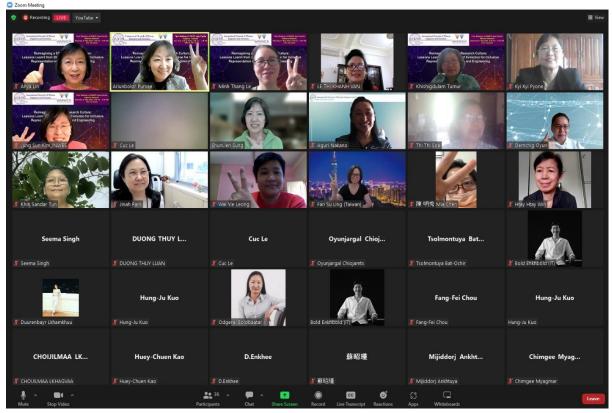








## Appendix 2b: Group photo of the second webinar



## Appendix 3: Banner photo of the first and second webinars







#### Appendix 4: emails of announcement

Dear APNN Country Representatives,

INWES is partnering with the University of Warwick in Coventry, England, on a project that has been funded by that University's "Enhancing Research Culture Fund." Georgia Kremmyda, VP Conferences of INWES and Professor of Engineering at the University of Warwick, was able to secure this funding for INWES. The title of the Project is: "Reimagining a STEM Research Culture: Lessons Learned from 20 years of Evolution for Inclusive Representation in Science and Engineering." The Project began February 1 and will end on July 31, 2022.

APNN is one of the networks involved in this project, which involves participating in two webinars on the subject of the Project: inclusivity in science and engineering. Please see the attached documents which provide further details.

As Chair of APNN, I have been asked to solicit your participation in the first of these two Webinars. Everyone can attend virtually, but if, after reading more about the aims of this project, you determine that you have a particular interest and expertise on this topic, please submit the title and abstract of what you would present. We can select a few members on this panel for the first Webinar, and a small honorarium will be provided. This project has the possibility for generating ideas, and data, for your scholarly research on the topic and its publication, using your information from your own country.

Please review the attached documents and if interested, submit your proposal to ariunbolor976@gmail.com or wstemmongolia@gmail.com before, March 9, 2022. The project team (Enhancing Research Culture Project) will start the first webinar with us (the APNN) on March 24th.

Thank you in advance for your interest and participation in this exciting new opportunity for INWES APNN. It will help shape our future success, and give a great deal of visibility to our organization, going forward, given the participation of all INWES regions in this project!

Please find the attached file of the Budget/Expense sheet to download, fill it in excel and send back it to the <u>ariunbolor976@gmail.com</u> or <u>wstemmongolia@gmail.com</u>.

Respectfully,

Associate Professor, Consulting Engineer

ARIUNBOLOR Purvee





## Appendix 5: brief introduction of speakers

### Ms. RYO KIMURA, JNWES (Japan Network of Women Engineers and Scientists)

Ryo Kimura is a women engineer with only 1.7% in Japan, and also works in rural environment planning, architectural design, landscaping and park design. She has been an engineer for over 40 years. Since 2019, she has been teaching design as a lecturer at Tokyo University of Agriculture and Technology and has been teaching career development classes at Kanagawa Institute of Technology. She has written several technical books. She was President of JSPEW from 2012 to 2018. She is currently the President of JNWES since 2018. Her email address: Ryo.kimura1111@gmail.com

### Dr. Seema Singh, WISE India (Women in Science and Engineering)

Dr Seema Singh is Professor of Economics at Delhi Technological University and has Headed the Dept of Humanities between August 2006 to December 2017. Largely, interested in issues related to Gender, Engineering Education and Labor Market, she has published and presented a number of papers and has also authored many books. She has also supervised scholars for PhD and Post-Doctoral Fellowship and completed successfully several research projects sponsored by national and international organizations. She is a Board Member for South Asia of the International Network of Women Engineers and Scientists (INWES) and Joint Secretary of the Indian Society of Labor Economics. She is also a member of the Editorial Board and Paper Reviewer for many Journals.

Her email address: <a href="mailto:seema.singh@inwes.net">seema.singh@inwes.net</a>

### Dr. Leong Wai Yie IET (Industry Revolution Malaysia)

LEONG received her PhD in Electrical Engineering (Hons I) from The University of Queensland (UQ), Brisbane, Australia in 2005. Leong is the Director of Research Excellence at Perdana University. Wai Yie is currently the Immediate Past Chairperson of The Institution of Engineering and Technology (Malaysia Local Network), the Vice President of the Institution of Engineers Malaysia, Vice President of International Network of Women Engineers and Scientists, and Committee Member of World Federation of Engineering Organization (Women in Engineering Committee). She specializes in medical signal processing and telecommunications research. She has been researching on IR4.0, wireless sensor networks, ultra-wideband and wireless communications, and on Brain Signal Processing for signal conditioning and classification in various EEG-based mental tasks.

Her email address: waiyie@gmail.com

# Prof. Dr. Anya Maan-Yuh Lin, TWiST (The Society of Taiwan Women in Science and Technology)

LEONG received her PhD in Electrical Engineering (Hons I) from The University of Queensland (UQ), Brisbane, Australia in 2005. Leong is the Director of Research Excellence at Perdana University. Wai Yie is currently the Immediate Past Chairperson of The Institution of Engineering and Technology (Malaysia Local Network), the Vice President of the Institution of Engineers Malaysia, Vice President of International Network of Women Engineers and Scientists, and Committee Member of World Federation of Engineering Organisation (Women in Engineering Committee). She specialises in medical signal processing and telecommunications research. She has been researching on IR4.0, wireless sensor networks,





ultra-wideband and wireless communications, and on Brain Signal Processing for signal conditioning and classification in various EEG-based mental tasks. Her email address: myalin@ym.edu.tw

### Ms. KHISHIGDULAM Tumurbaataryn, WSTEM Mongolia

Khishigdulam Tumurbaataryn is an experienced HEIs partnership consultant who engages with academic capacity building and promotes contemporary Mongolian studies internationally. Her working network involves many national HEIs, the Academy of Science, public institutions and businesses. Her projects, such as Prize Winners Lecture Series, Business in Classroom Lecture Series, Academic Leadership and Project Management, involve multi-party collaborative fundraising, partnership development, and building public awareness for science and academia. Her email address: tsegyt@gmail.com

### Dr. Le Minh Than, Vietnam Association for Intellectual Women

Le Minh Thang is a professor at Department of Organic and Petrochemical Technology School of Chemical Engineering, Hanoi University of Science and Technology; she is an expert in the field of catalysis in Vietnam and currently is the committee member of Asia Pacific Association of Catalysis. She obtained her engineer degree of petrochemistry at Hanoi University of Science and Technology in 1997 and her PhD of Chemistry at Ghent University in 2005. She presently is the Head of Hanoi University of Science and Technology branch of Vietnam Association for Intellectual Women and the committee member of Vietnam Association for Intellectual Women