

REPORT

IAP-AASSA-AIPI INTERNATIONAL SEMINAR

“SCIENCE LITERACY IN THE DIGITAL ERA”

INDONESIAN ACADEMY OF SCIENCES (AIPI)
Jakarta, 20-21 June 2023

AASSA International Seminar on SHARE
(Science, Health, Agriculture, Risk & Environment)
Communication Hybrid Seminar

Keynote Speakers:

- Mr. Muhammad Syarif Bando, MM**
Head of National Library of Republic of Indonesia
- Mr. Semuel Abrijani Pangerapan, MM**
Director General for Application of Informatics KOMINFO
- Prof. Dr. Nizam**
Director General for Higher Education, Research & Technology, DIKBUDRISTEK
- Dr. Kavita M. Berger**
Director for the Board on Life Sciences at NASEM USA
- Prof. Xiang-ping Wu**
World Organization for Science Literacy (WOSL)
- Ms. Marielza Oliveira, PhD.**
Director for Partnerships and Operational Programme Monitoring Communications & Information Sector UNESCO
- Prof. Hak-Soo Kim**
Life member of PCST Network

SCIENCE LITERACY IN THE DIGITAL ERA
20-21 June 2023
National Library Building
Jl. Medan Merdeka Selatan 11, Jakarta

ZOOM: s.id/ScienceLiteracy2023
YOUTUBE: Perpustakaan Nasional RI

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SCIENCE LITERACY IN THE DIGITAL ERA

I. BACKGROUND

Digital literacy is the ability using information and communication technology (ICT) to evaluate, create, and communicate information, desirable for well-being of individuals, communities and society. Science is a way of knowing, a process, a product, and an institution. Science enables people to engage in the construction of new knowledge and use information to achieve desired ends. Access to science - whether using knowledge or creating it – necessitates level of familiarity with enterprise and practice of science, as referred as science literacy. Contemporary definitions of science literacy have expanded to include: understandings of scientific processes and practices, familiarity with how science and scientists work, capacity to weigh and evaluate products of science, and ability to communicate and engage in public decisions about science value.

The pandemic era of COVID-19 is the example that digital literacy becomes crucial to the means of promoting awareness and healthy behavior to public by various creative approaches. These evident nurtures the spread of science literacy in society, which refers to general public engagement contribution to information, how science and scientists work, capacity to weigh and evaluate products of science information, and ability to communicate and engage in public decisions about literacy value.

The evident hastens more rapid development of ICT (information and communication technology) due to the restriction of crowd gathering and people should work and educate from home. These momentums make people build a conducive environment of research and development, increasing public awareness and understanding of S&T, community responsibility to make their work more accessible and understandable to public, by developing various applications. One of the applications used is AI development of ChatGPT which gives the opportunities to ease communication and saving time. On the other hand, public need to be aware to its threats and negative impacts, such as data privacy violations and dissemination of inaccurate information.

So that wider coverage of public should be engaged in science literacy, which is relevance as an intermediary among scientists and public in providing information through various platforms, in order to increase the ability to communicate and engage in public decisions about science and technology values.

The Indonesian Academy of Sciences (AIPI) has initiated in proposing a seminar to hasten the spread of science literacy digitally. Science Academies are the prestigious institutions which consist of fellows from various universities and research & development centers. They are proper in spreading the trusted science information throughout digital literacy as one of the tools. The proposal is backed up by the Inter-Academy partnership (IAP) and supported by the Association of Academies and Societies of Sciences in Asia (AASSA) especially the special committee in SHARE Communication (Science, Health, Agriculture, Risk and Environment) in the regional level. In the national level, a respective support of Digital Literacy gained from the Ministry of Communication and Informatics and the National Library of the Republic of Indonesia through the Advancement of Public Literacy Program.

“Science Literacy for the Betterment of Humankind” was firstly proposed by AIPI as a theme of seminar. However, after having discussion with the SHARE Communication Committee of AASSA, it seems that we should raise the issue of digital literacy as well, as the ultimate information in social media recently connected with digital literacy, science literacy, mislead information, hoaxes, etc. The theme of seminar therefore has been changed into “Science Literacy in the Digital Era”.

Sharing best practice and information about the development of science literacy and digitize the communication among countries is essential, especially those producing the fast ICT advancement, to take the opportunity in addressing its advantages and problems. The experience shared in the seminar would be the reference for other countries in addressing the improvement of science literacy system, to attract public in that particular areas. In the national level, the support from government is also a powerful catalyst in producing criteria, policy / regulation, security, program, as well as incentive to speed up the digital literacy development approaching public understanding.

The seminar seeks to address the strategic objectives in promoting the importance of research and education in digital literacy, such as: promoting high-quality, responsible, open, transparent and inclusive information; communicating and disseminating initiatives and creativities in accessible ways; supporting activities that foster the next emerging digital technology through collaborations; promoting public engagement in science literacy.

The seminar should contribute to the capacity building in the regional as well as in global alliances and should give benefits in promoting science-policy interface to advance the evidence-based policy making. So that it will be meaningful in addressing the challenges and contentious issues of science literacy in the digital era.

Beside Proceeding of the Seminar, the output is the Recommendations that should disseminate to AASSA members and stakeholders, to be circulated to their stakeholders and public concerns. AIPI then continue to produce the policy brief from the Recommendations of this Seminar, that should be distributed to the respective governmental bodies and stakeholders.

II. SEMINAR IMPLEMENTATION

Date and duration	: Hybrid seminar, 20-21 June 2023
Place	: AIPI Premises at National Library Building, Jl. Medan Merdeka Selatan 11, Jakarta
Participants/ Speakers	: Government bodies, international bodies and associations, researchers, educators, communities, etc.
Language	: English

AGENDA OF SEMINAR

Time	Sequence	Speakers
DAY 1	20 June 2023	
08:30	Registration	Coffee morning
	Prelude	
09:00	Welcome & Congratulatory Remarks	<p>Opening by Facilitator, the Conversation Indonesia</p> <ul style="list-style-type: none"> • Welcoming Remark: Dr. Finarya Legoh, Chair of SHARE Communication of AASSA • Opening Remark: Prof. Dr. Satryo Soemantri Brodjonegoro, President of the Indonesian Academy of Sciences (AIPI)/ Vice President of AASSA • Opening Remark: Prof. Dr. Ahmet Nuri Yurdusev, President of the Association of Academies and Societies of Sciences in Asia (AASSA)
10:00	Keynote Speakers	<ul style="list-style-type: none"> • Dr. Kavita M. Berger; <i>Addressing Inaccurate and Misleading Information</i>; Director, Board on Life Sciences, Division of Earth and Life Studies, at National Academy of Science Engineering and Medicine (NASEM), USA (<i>online</i>) • Prof. Xiang-ping Wu; World Organization for Science Literacy (WOSL); Chinese Academy of Sciences (<i>online</i>) • Mr. Samuel Abrijani Pangerapan, MM; Director General for Application of Informatics, Ministry of Communication & Informatics (KOMINFO), represented by Dr. Boni Pudjianto, Director of Digital Literacy of Ministry of Communication & Informatics (<i>online</i>) • Mr. Muhammad Syarif Bando, MM: Head of National Library of Republic of Indonesia
11:00		Signing MOU between National Library of Indonesia and Indonesian Academy of Sciences

11:10	Break	
11:25	Session 1	<p>Moderator: Prof. Dr. Anjana Singh; Academician, Nepal Academy of Science & Technology (NAST); Central Department of Microbiology, Tribhuvan University, Kirtipur, Kathmandu, Nepal</p> <ul style="list-style-type: none"> • Dr. Hammam Riza; <i>Science Literacy in the Digital Era: Building Ethical AI Capacity</i>; Centre of AI and Cybersecurity, National Research & Innovation Agency (BRIN); Chair of AI Committee of Centre for Technology and Innovation Studies (CTIS) • Prof. Dr. Zabta Khan Shinwari; <i>Ethical Considerations in Communicating Science in the Digital Age</i>; Pakistan Academy of Sciences; Vice President, Islamic World Academy of Sciences; Quaid-i-Azam University, Islamabad-Pakistan • Dr. Ganigar Chen; <i>Curiosity Wins & Science Communication in the Landscape of Digital Era: NSM Thailand Experience</i>; Vice President of National Science Museum, Pathum Thani, Thailand • Prof. Hendra Gunawan; <i>Nurturing Children's Science Literacy</i>; Fellow of AIPI for Basic Science Commission; Faculty of Mathematics & Natural Sciences, Institute Technology of Bandung • Prof. Dr. Mehmet Emin Aydin; <i>Digital Transformations in Universities – Experiences in Turkey</i>; Turkey Academy of Sciences (TUBA); Necmettin Erbakan Üniversitesi, Konya – Turkey
12:25	Lunch break	
13:30		Book Launching
13:40	Keynote Speaker & Session 2	<p>Moderator: Prof. Zabta Khan Shinwari; Pakistan Academy of Sciences; Vice President, Islamic World Academy of Sciences; Quaid-i-Azam University, Islamabad-Pakistan</p> <p>Keynote Speaker:</p> <ul style="list-style-type: none"> • Ms. Marelza Oliveira, PhD.: Director for Partnerships and Operational Programme Monitoring Communications and Information Sector; the United Nations Educational, Scientific and Cultural Organization (UNESCO) (<i>online</i>) <p>Session 2:</p> <ul style="list-style-type: none"> • Prof. Narinder Mehra; Vice Chair of Indian National Science Academy (INSA); expert in Transplant Immunology and Clinical Immunogenetics

		<ul style="list-style-type: none"> • Prof. Budi Wiweko; <i>Digital Literacy in Health</i>; Fellow of AIPI for Medicine Science Commission; Faculty of Medicine, University of Indonesia (<i>online</i>) • Prof. Dr. KOIKE Toshio; <i>Integration of knowledge and capacity towards building sustainable and resilient society by all</i>; Executive Director, International Centre for Water Hazard and Risk Management (ICHARM), Public Works Research Institute (PWRI), Tsukuba, Japan
14:40	Session 3	<p>Moderator: Prof. Narinder Mehra; Vice Chair of Indian National Science Academy (INSA)</p> <ul style="list-style-type: none"> • Dr. Aristotle Carandang; <i>We are What We Do</i>; Director, Institute of Indigenous Science, Technology, Arts & Society; Philippine Women’s College of Davao, Davao City, Philippines • Dr. Johannes Haryatmoko; <i>Digital Era: Educator’s Mindset Change for the New Learning Models</i>; Fellow of AIPI for Culture Commission; University of Sanata Dharma Jogjakarta (<i>online</i>) • Prof. Dr. Abhi Veerakumarasivam; <i>Bridging the Trust Deficit: Embracing Our Social Responsibility, Enhancing Science Literacy</i>; Provost, Sunway University of Malaysia; Chair, International Network for Government Science Advice Asia (INGSA-Asia) • Dr. Nguyen Tuong Lan; <i>The digital Transformation Program in Vietnam Academy of Science and Technology</i>; Manager of S&T Development of Forecasting Department, Institute for Scientific Information, Vietnam Academy of Science • Melanie Hughes, Curriculum Specialist, Technologies & Simon Collier, Curriculum Specialist, Science; <i>Digital Literacy in the Australian Curriculum: A Focus on Science and Digital Technologies</i>; Australian Curriculum Assessment and Reporting Agency (ACARA) (<i>online</i>)
15:40	Coffee break	
	Interlude	
16:00	Session 4	<p>Moderator: Prof. Dr. KOIKE Toshio; Executive Director, International Centre for Water Hazard and Risk Management (ICHARM), Public Works Research Institute, Tsukuba, Japan</p> <ul style="list-style-type: none"> • Prof. Pavel Krestov; Director of Botanical Garden Institute, Vladivostok – Russia; Vice-President of Far Eastern Branch of the Russian Academy of Sciences (<i>online</i>)

		<ul style="list-style-type: none"> • Prof. Dr. Anjana Singh; <i>University Experience in Science Literacy in the Digital Era</i>; Academician, Nepal Academy of Science & Technology (NAST); Central Department of Microbiology, Tribhuvan University, Kirtipur, Kathmandu, Nepal • Prof. Suhono Harso Supangkat; Institute Technology of Bandung • Mr. Firdza Radiany; Pandemic Talk, UNICEF Indonesia • Dr. Zulfa Zhakiyya; <i>Literacy and Scientific Temper: What is missing? What can be improved? What does it take?</i>; Fellow of Indonesian Young Academy of Sciences (ALMI); State University of Semarang
17:00	Summing Up Day 1	<ul style="list-style-type: none"> • Prof. Dr. Manoj Kumar Patairiya; President International Science Writers Association, New Delhi, India; Former Chair of SHARE Communication • Ms. Dyah R. Permatasari; CEO of DoctoRabbit Science
17:45	Break	
	Dinner	Dinner hosted by AASSA (Speakers & OC)
DAY 2	21 June 2023	
08:30	Registration	Coffee morning
	Prelude	
		Opening by Facilitator, the Conversation Indonesia
09:00	Keynote Speakers	<ul style="list-style-type: none"> • Prof. Hak-Soo Kim; <i>Science Literacy for Problem Solving</i>; Life Member, Public Communication on Science & Technology (PCST); Former Chair and Founder of AASSA Special Committee on SHARE Communication
09:45	SHARE Communication	<p>Moderator: Prof. Dr. Mehmet Emin Aydin; Turkey Academy of Sciences (TUBA); Necmettin Erbakan Üniversitesi, Konya – Turkey</p> <ul style="list-style-type: none"> • Dr. Finarya Legoh; <i>Introducing AASSA Special Committee on SHARE Communication</i>; Chair of SHARE Communication; Faculty of Engineering, University of Indonesia • Prof. Manoj Patairiya; <i>Science Communication in the Age of AI: Opportunities, Challenges and Strategies</i>; President International Science Writers Association, New Delhi, India; Former Chair of SHARE Communication

		<ul style="list-style-type: none"> • Dr. Vishnu Pratap Singh; <i>E-Training Course in Science Journalism</i>; Academic Coordinator of Training Course in Science Journalism, National Council for S & T Communication, Department of S & T India • Dr. Inaya Rakhmani; <i>Communicating Social Science in Digital Times</i>; Honorary member of Indonesian Young Academy of Sciences (ALMI); Director of the Asia Research Centre, Universitas Indonesia • Mr. Ahmad Nurhasim; <i>Science Communication in Indonesia: Progress and Challenge</i>; Science and Health Editor, the Conversation Indonesia • Ms. Dyah R. Permatasari; <i>STEAM Education in the Digital Era</i>; CEO of DoctoRabbit Science
10:45	Break	
11:00	Panel Discussion: Fireside Chat on Digital Literacy Community	<p>Moderator: Dr. Harjanto Halim; Chair of National Education Foundation of Karangturi, Semarang</p> <ul style="list-style-type: none"> • Dr. Ardi Sutedja; Chief Indonesia Cyber Security Forum • Dr. Ganigar Chen; Vice President of National Science Museum, Pathum Thani, Thailand • Prof. Abhi Veerakumarasivam; Provost, Sunway University of Malaysia, INGSA-Asia • Prof. Dr. Agus Haryono; Deputy of Research & Innovation Facility, National Research and Innovation Agency (BRIN)
11:45	Summing Up and Recommendation	<ul style="list-style-type: none"> • Prof. Hak-Soo Kim; Life Member, Public Communication on Science & Technology (PCST); Founder of AASSA Special Committee on SHARE Communication • Dr. Aristotle Carandang; Director, Institute of Indigenous Science, Technology, Arts & Society; Philippine Women's College of Davao, Davao City, Philippines
12:00	Closing Remark	<ul style="list-style-type: none"> • Prof. Dr. Ahmet Nuri Yurdusev, President of the Association of Academies and Societies of Sciences in Asia (AASSA) • Prof. Dr. Satriyo Soemantri Brodjonegoro, President of the Indonesian Academy of Sciences (AIPI) / Vice President of AASSA
12:10		Lunch
14:00		City Tour
19:30		Dinner (speakers & OC)
	23 June 2023	Farewell to international participants

III. DAY 1, 20th JUNE 2023

III.1. WELCOMING AND OPENING REMARKS

Welcoming Remark

The venue is started by the Welcoming Remark by the Chair of Special Committee on SHARE Communication, Dr. Finarya Legoh. First, on behalf of the Organizing Committee she conveys a warmest welcome to the keynote speakers, speakers, panelists, moderators, and invited participants and attendees in the forum in-person and virtually.

The presence, support and contribution to the Seminar, means so much for the OC, uplifting the spirit to organize this seminar, “Science Literacy in the Digital Era”, which lately become more and more important.

The seminar is organized in a hybrid mode to accommodate as many as attendees whose care about the theme, which is notable for progressing the science and technology advancement for the betterment of humankind. To make available to more participants international and nationally, the seminar accommodates the virtual access through zoom and YouTube platform.

Starting more than one year ago, when AIPI proposed a joint collaboration program to the Inter-Academy Partnership (IAP) and the Association of Academies and Societies in Asia (AASSA), then to the Ministry of Communication & informatics, and lately to the National Library of Indonesia, which all welcome the ideas and support it. Then a backup from the Committee on SHARE Communication (Science, Health, Agriculture, Risk, and Environment) is given too. AIPI appreciates for all the support to make this event happen, and thanks to the marvelous Organizing Committee for the good work in realizing the 2-day seminar.

To catch up with current information, we realize that digital literacy is a tool to open our horizon quickly, easily and widely. Rapid development provides many opportunities to ease communication and saving time, however, what we should consider as well is awareness of threats and negative impacts such as data privacy violations, security and dissemination of inaccurate information, and how do we apply ethics in cyberspace.

The OC hope that we could get the experience, knowledge, as well as wisdom, from the speakers and panelists, especially in the digital era of development of science literacy. We hope that we could have a productive discussion that should give advantage to all. She thanks to all.

Opening Remark 1

President of AIPI / Vice-President of AASSA, Prof. Satryo Soemantri Brodjonegoro, as a representative host from the Indonesian Academy of Sciences (AIPI), conveys his opening remark below, after greets to the keynote speakers, speakers, panelists, moderators, and invited participants and attendees in the forum in-person and virtually.

He thanks for their presence, support and contribution, for the Seminar, which is organized as hybrid to accommodate as many as attendees whose care about the theme, “Science Literacy in the Digital Era”. This is noteworthy for progressing the science and technology advancement, as well as humankind’s comfort and convenience life style.

Science literacy is desirable not only for individuals, but also for the health and well-being of communities and society. More than just basic knowledge of science facts, contemporary definitions of science literacy have expanded to include understandings of scientific processes and practices, familiarity with how science and scientists work, a capacity to weigh and evaluate the products of science, and an ability to engage in civic decisions about the value of science. The best concepts of science can be explained in simple terms and do not require complex vocabulary. Scientific literacy allows an individual to share the ongoing exploration, discovery, and inventions.

Science is a way of knowing, a process, a product, and an institution. Science enables people to engage in the construction of new knowledge and use information to achieve desired ends. Access to science - whether using knowledge or creating it – necessitates level of familiarity, with enterprise and practice of science, as referred as science literacy.

Four broad rationales have been proposed as to why science literacy is important and necessary: the economic rationale, the personal rationale, the democratic rationale, and the cultural rationale. The economic rationale is closely related to the impetus for educating the general population in science. The personal rationale is that science literacy helps people respond to issues and challenges that emerge in their personal and community contexts. The democratic rationale rests on the claim that a democracy only functions, or at least functions better, when its citizens are informed participants in civic decision making. While the cultural rationale is the idea that sciences offer some of the best that is worth knowing. Sciences are important cultural activities that offer a powerful way of understanding the world and should therefore be part of what it means to be liberally educated.

Digital literacy is the ability using information and communication technology (ICT) to evaluate, create, and communicate information, desirable for well-being of individuals, communities and society. Rapid ICT development provides various platforms to give the opportunities to ease communication and saving time. On the other hand, public need to be aware to its threats and negative impacts, such as data privacy violations and dissemination of inaccurate information.

The pandemic era of COVID-19 is the example that digital literacy becomes crucial to the means of promoting awareness and healthy behavior to public by various creative approaches. These evident nurtures the spread of science literacy in society, which refers to general public engagement contribution to information, how science and scientists work, capacity to weigh and evaluate products of science information, and ability to communicate and engage in public decisions about literacy value.

It is why, the Indonesian Academy of Sciences (AIPI) has initiated in proposing a seminar to hasten that spread of science literacy digitally. We understand that Science Academies are the prestigious institutions which consist of experts whose are proper in spreading the trusted science information throughout digital literacy as one of the tools. The proposal is backed up by the Inter-Academy

partnership (IAP) and supported by the Association of Academies and Societies of Sciences in Asia (AASSA) especially the special committee in SHARE Communication (Science, Health, Agriculture, Risk and Environment) in the regional level. In the national level, a respective support of Digital Literacy gained from the Ministry of Communication and Informatics and the National Library of the Republic of Indonesia through the Advancement of Public Literacy Program.

Sharing best practice and information about the development of science literacy and digitize the communication among countries is essential, especially those producing the fast ICT advancement, to take the opportunity in addressing its advantages and problems. The experience shared in the seminar would be the reference for other countries in addressing the improvement of science literacy system, to attract public in that particular areas. In the national level, the support from government is also a powerful catalyst in producing criteria, policy / regulation, security, program, as well as incentive to speed up the digital literacy development approaching public understanding.

AIPI proposes to promote the role of academic expertise in advancing on the interconnected goals of healthier populations, more sustainable ecosystems, and more equitable societies. Given recent world events, informed and thoughtful action has become a matter of unmistakable urgency. Climate disasters, COVID-19, and war have together taken millions of lives in a few short years, as well as had enormous costs in public resources needed for healthcare, education, and climate action.

The seminar seeks to address the strategic objectives in promoting the importance of research and education in digital literacy, such as: promoting high-quality, responsible, open, transparent and inclusive information; communicating and disseminating initiatives and creativities in accessible ways; supporting activities that foster the next emerging digital technology through collaborations; promoting public engagement in science literacy.

He hopes that we will have a fruitful discussion that should contribute to the capacity building in the regional as well as in global alliances, and should give benefits in promoting science-policy interface to advance the evidence-based policy making. So that it will be meaningful in addressing the challenges and contentious issues of science literacy in the digital era. Our hope is that people in all fields should have digital science literacy in accordance with their respective capacities, so that they can survive against future challenges. He then thanks to all speakers and attendees.

Opening Remark 2

The second opening remark conveys by the President of AASSA, Prof. Ahmet Nuri Yurdusev, which his speech is stated below, after greets to the keynote speakers, speakers, panelists, moderators, and participants in the forum in-person and virtually.

It was five years ago when he first visited Jakarta and it was on the occasion of another AASSA workshop hosted by IAP and involved again in share communication committee of AASSA. He thanks to local organizing committee, Indonesian Academy of Sciences (AIPI), the National Library and the Ministry of Information and Communication, for organizing and hosting the event. AIPI has been one of the most active academies within AASSA community.

He mentions that the SHARE Communication is one of the oldest and active of special committee within AASSA, which was established at first as SHER Communication in 2015, then became SHARE Communication in 2018. Many seminars and workshops have been accommodated by SHARE Communication Committee, which intentionally to disburse and exchange information regarding SHARE Communication.

This seminar is proposed by AIPI as an active member of AASSA to the Inter-Academy Partnership (IAP) throughout AASSA for the funding and support, for the activity year of AASSA 2022-2023, as the members can propose activities, workshops, seminars, webinars, symposiums or conferences.

IAP as the global network of science academies and science societies with more than 150 members has 4 regional networks, which for Asia is AASSA. The proposal has been submitted to IAP, and after evaluating by the Executive Board it is granted. So far, AIPI never turns down the proposal, always been granted successfully. We are happy that the proposal from AIPI covers the important topic timely, as literacy in general and science literacy in particular have always been significant for scientists, academia, society, and human beings. The literacy especially in science, and communicate our message with the right information, is important for making life easier.

As a scientist within a science organization, we encourage and make possible the science literacy to be communicated to society and to be socialized digitally. Digital revolution is remarkable opportunity to ease communicating general knowledge or specified, and science in particular.

Leadership and scientists enable us to communicate our message and also to communicate reliable information when it comes to science literacy. It has always been important throughout human history. A group of philosophers known as the Sophists in ancient Greeks, they had this argument: we can never know the reality, even if we can, we can never understand its essence. Even if we can understand it, we can never communicate to others. Even if we can communicate it to others, they cannot understand. As you see their argument, the law force against literacy, against scientific, and I have to say that they were deadly wrong.

As scientists and science organizations, we have shown that literacy and science literacy is possible and we can communicate our message to others, to society, to humanity in general. It has become even more significant nowadays with the digital revolution. Digital revolution enabled us remarkable opportunities in terms of accessing, learning and communicating knowledge in general and scientific knowledge in particular.

Yet, just like many other technologies, digital technology also has paved the way for increasing misuse, mistrusted and thus inaccurate information. This brings our enormous responsibility as a scientist and scientific organization, to not only generate the accurate scientific information but also to communicate the correct mislead information via the proper channels. Our job is to explain and to find ways communicating it to society with reliable and proper channels throughout non-digital or digital social media, so that misused and inaccurate information can be decreased and prevented.

By examining the various aspects of scientific in the digital era, this seminar should bring various issues and problems in this respect. It will also contribute to responsible practice to both science community and society at large.

He looks forward to listen the presentations and to learn from the experts. In concluding the remarks, he thanks and congratulates AIPI and partner organizations to organize the seminar, and he makes sure to pledge the continuous support from AASSA for such important program.

III.2. KEYNOTE SPEAKERS

Four online and off-line keynote speakers are present in the seminar. They are:

1. **Dr. Kavita M. Berger** (online); Director, Board on Life Sciences, Division of Earth and Life Studies, at National Academy of Science Engineering and Medicine (NASEM), USA. The title of her talk is: “*Addressing Inaccurate and Misleading Information*”.

The US National Academy of Science, Engineering, and Medicine has been working to tackle misleading information, mainly disinformation and misinformation, through two actions: by creating various initiatives and platforms and by creating a network of global scientists from multiple disciplines.

- The network or the committee of scientists is a distributed network of individuals and organizations that draws on diverse scientific disciplines and sectors to correct inaccurate and misleading scientific information.
- Recommendation: long and short-term plans to attain the objectives that are to address inaccurate and misleading information.
- The need to development of science communication and public engagement to enhance their communication skills to communicate science accurately and effectively.
- The importance of building trusted connections with country-specific programs to combat misinformation in the local language.
- “The best available science at the moment” are: to face uncertainty in the future, open access to science, and make science accessible at all times.
- Scientists must understand and listen to their audiences (putting the values and believes system of the audiences up front).
- Create a framework/ guide to asses specific potentially misleading claims, and counterclaim them with science. The framework is essential because, during counterclaiming, it might also amplify the misinformation.

2. **Prof. Xiang-Ping Wu** (online); a representative from the World Organization for Science Literacy (WOSL), and the Chinese Academy of Sciences (CAS). The title of presentation is “Digital Empowerment to Promote Civic Science Literacy in China”.

- As of now, in China, civic scientific literacy in the proportion of citizens has been growing steadily from 2001 until 2020.

- A new digitalization framework was developed because it has been made apparent that digitalization profoundly impacts to society.
- The outline emphasizes the characteristics of the digital age, one of the things is to popularize science in various platforms and media channels.
- Promote science popularization and integrate that promotion with digital development: mainly for intelligent cities, digital economy, etc.
- The outline ensures the availability of digital resources, which are made available for lifelong learning related to the digital age and how society can adapt.
- The digital divide exists as a result of differences in the digital competence of citizens, which the older generation is the primary concern for this divide.
- To bridge that divide, various stakeholders including the government, must take their part by creating sufficient policies that facilitate the transition for the older generation to the digital era, such as: Internet companies by developing interfaces that are inclusive for older people, media by promoting and reporting the importance of older generations in using their digital skills, community by organizing learning and training activities that are older people friendly, and the elderly should also have the awareness and action of lifelong learning.

Q and A in the Discussion Session:

Q. “In putting forward science literacy, is there a practical action that we can take especially considering that most people are still struggling to provide for their food? As of now, it is important that not have anyone left behind.”

Dr. Berger: As of now, more is needed to battle misinformation, especially in social media. However, some practical actions have been taken, but what is proven to be successful is teaching people how to read and use data visualization—ensuring that they know how to read and understand scientific data, so that people can know the type of influence that is taking place. Currently, we can collect the existing practices and look for the most effective means to promote science literacy.

Q from Prof. Wu: “We see trends from the commercial sector, how integration has become pertinent. How would that reflect on the current issue?”

Dr. Berger: Science changes over time, you might have a set of data and analysis, but with time if we have new data, it changes the analysis. How can we ensure the general public, government, and everyone understand how science works? In an open scientific space, scientists can point out to each other.

Comment: A global governance framework must address the interoperability and interconnectivity that ensure data security and privacy. The creation of rules and regulations for data should also be one of the priorities.

Dr. Berger: It is an enjoyable recommendation. However, data governance is proven to be very complex. The lack of universal interoperability and not shared understanding of digital governance also adds to the situation's complexity.

3. **Dr. Boni Pudjianto** (online); Director of Digital Literacy of the Ministry of Communication & Informatics of Indonesia.

- Science literacy is defined as the ability of people to dissect, understand, and evaluate evidence to conclude.
- In the digital age, science literacy is essential to distinguish misinformation from possible disinformation. It allows people to judge various aspects of information.
- Right now, digital literacy is necessary to navigate and communicate digitally.
- The importance of science and digital literacy has become apparent, especially during the pandemic. For example, despite the development of vaccines to control the spread of the pandemic, we see how false information affected people badly because, despite the development, data, and science behind vaccines, false information is why people refused to get vaccinated.
- We must come forward knowing that digital literacy is part of our everyday lives.

4. **Mr. Muhammad Syarif Bando, MM** (in-person); Head of the National Library of the Republic of Indonesia.

- The main objective of developing literacy is to create a reading society and a learning society to enrich the nation's life, characterized by improving human resource quality as a driving force for national development towards a civil society.
- According to the Perpustakaan Nasional definition, digital literacy means the depth of an individual's knowledge in a particular subject, which can be implemented with high innovation and creativity to produce quality goods and services usable to win the global competition.
- As of now, Indonesia has a lot to learn from its surrounding countries.
- Digital literacy has real-life implications for learning and learning how the economy works.
- The transfer of technology, the knowledge-based economy, and how the economy grows, they rely heavily on the nation's capacity to learn.
- It is important to strengthen the role of libraries in developing repositories and transforming knowledge, as well as enhancing literacy culture to improve the capabilities of human resources.
- This will help narrow the income per capita gap among the population and prepare for new threats arising from the widespread implementation of Artificial Intelligence (AI) and the hegemony of superpower nations in controlling global economic resources and markets.

Before coffee break for 15 minutes, there is an event of signing Memorandum of Understanding (MoU) between the National Library of Indonesia and the Indonesian Academy of Sciences (API) for a mutual collaboration regarding developing and disseminating Science and Technology literacy to public.

III.3. SESSION 1

Session 1 is moderated by **Prof. Dr. Anjana Singh**, the academician from the Nepal Academy of Science & Technology (NAST); she is also a Professor from the Central Department of Microbiology, Tribhuvan University, Kirtipur, Kathmandu, Nepal. Five speakers present their talk, they are:

1. **Dr. Hammam Riza**; Centre of AI and Cybersecurity, National Research & Innovation Agency (BRIN); Chair of AI Committee of Centre for Technology and Innovation Studies (CTIS), with a title of: “*Science Literacy in the Digital Era: Building Ethical AI Capacity*”.

- Who leads AI technology by 2030 will lead the world by 2100. The discussion of AI has been surrounded by whether this will be an utopia or a dystopia.
- There have been various use cases of AI, but AI has enormous potential to be developed as it can transform various livelihood sectors.
- Using science literacy, we can drive our goals to ensure ethical and responsible AI.
- There should be a framework to ensure the ethical use of AI and sustain the trust of employees and customers, answering privacy and data security concerns.
- What constitutes AI ethics? AI Ethics is a collection of considerations for responsible AI that combines safety, security, human concerns, and environmental considerations.
- Experience with AI has demonstrated that following good AI ethics is not just responsible behavior, it also requires to get good business value out of AI. Ethics issues can pose business risks such as product failures, legal issues, etc.
- AI systems can only be as biased as the data that has been provided. We must ensure data diverseness to reduce AI bias so that AI will not amplify or perpetuate societal prejudice and tension.

2. **Prof. Dr. Zabta Khan Shinwari**; Pakistan Academy of Sciences; Vice President, Islamic World Academy of Sciences; Quaid-i-Azam University, Islamabad-Pakistan; with a title of “*Ethical Considerations in Communicating Science in the Digital Age*”.

- We must consider the importance of accuracy and transparency in reporting methods, the data provided and resources.
- Open access as something to uphold accuracy and transparency leads to conflicts of interest such as privacy and data protection, as there are ethical considerations related to privacy.
- Science communication and academia is to facilitate sharing knowledge and understanding of specialists or experts to a non-specialist group.
- Who is responsible, or who should be doing science communication? Science communication is being done voluntarily by academia. However, its importance also requires particular skills to support its action.
- There is a need for advocacy for science communication, ensuring there is information turns into strategy and becomes active. Advocacy shall also improve research and enriches the field of science.
- Does the media accurately portray public attitudes? Does the media influence public attitudes or concerns? Are public concerns an influencer of behavior? They concern in science communication.

3. **Dr. Ganigar Chen**; Vice President of National Science Museum (NSM), Pathum Thani, Thailand. The title of her talk is “*Curiosity Wins & Science Communication in the Landscape of Digital Era: NSM Thailand Experience*”.

- The National Science Museum of Thailand has recently adopted science communication and digitalization as part of its development.
- As of now, the National Science Museum is implementing a public-driven science communication to improve inclusivity and reach out to a larger audience.
- Firstly, this science communication implied that there should be better engagement and it has to stipulate a sense of curiosity-interesting based upon the audience.
- Secondly, the museum intended to create a sense of community through community building. That is by having the engagement answered by the museum.
- Thirdly, that is only possible by opening up and receiving public feedback and monitoring.
- Lastly, in terms of execution and implementation, the museum uses content management and strategy by working close with the specialists.
- Reflecting upon the growth of NSM's social media presence and engagement that has significantly spurred curiosity and interest in the people, there has to be a specific framework for content creators when using science communication.
- We should always catch up to learn new tools and adapt to new landscapes, also adapt an agile working style (work and learn vastly).
- It is essential for literacy and learning institutions to optimize the use of digital resources.

4. **Prof. Hendra Gunawan**; Fellow of AIPI for Basic Science Commission; Professor in the Faculty of Mathematics & Natural Sciences, Institute Technology of Bandung; with a talk of “*Nurturing Children’s Science Literacy*”.

- There is a significant concern surrounding the growth of Gen Z in Indonesia and how Gen Z is living in the Z era, which implies excellent interconnectedness and digitalization. However, that might be paired poorly with their literacy scores in Indonesia.
- The big question regarding science literacy is: “What is available on the Internet (including all the apps) that can support Gen Z education (broadly)? What can we contribute to our children’s science literacy?”
- A strategy to increase this interest in science literacy is to publish popular materials related to science and the kids’ interest, and making them accessible to kids. (It can be started with blog and books, then it became audiobooks, visual books, and other familiarized materials).
- As of now, there have been plenty of publications on scientific endeavors, but they are targeted for scientific purposes and need more dissemination to the youth and public.
- The creation of these books can reach a larger audience and provide options for parents and children to choose science books that are understandable and digestible for children.
- Scientists must be more active in promoting science to society, especially to the youth, by using various media available on the Internet and/ or others.
- Supports and sponsoring from the government and industries are essential. In my case, which is presented here, sponsorship for producing and distributing books is helpful. Besides, sponsorship for events such as Science Festival is also crucial.
- Scientists and science graduates who are potential to become science communicators should be encouraged and supported.

5. **Prof. Dr. Mehmet Emin Aydin**; Fellow of Turkey Academy of Sciences (TUBA); Professor from the Necmettin Erbakan Üniversitesi, Konya; the title is “Turkey *Digital Transformations in Universities – Experiences in Turkey*”.

- Due to the COVID-19 pandemic, the world has to move to the digital environment, where traditional habits and concepts have been changed rapidly. From the lessons learned of the data related to academic lifecycle and learning, it becomes more imminent to adapt to these changes.
- Institutions are practicing and adopting guidelines for remote teaching and assessment. In Turkey, several platforms are being developed, namely: ULAKBİM Databases (aggregated open access for scientific publication), National Thesis Center, DergiPark (National open journal collection), TRindex (TR Index was developed following international standards for researchers to access national and scientific content electronically), TUBA Open Course Materials Portal, YÖK (Council of Higher Education) Courses Platform and virtual laboratory.
- For the development of digital research and education ecosystem, the infrastructure, connectivity, digital equipment, institutional digital capacity, and digital competence of staff should be improved.
- High-quality and user-friendly learning content should be prepared to combine with existing content and learning methods.
- Scientific works such as research, innovation, and publication, should be supported.
- Promotion regulations of academic staff should be adjusted periodically to increase the quality of research, education, and publication.

After the lunch break of 60 minutes, there is an event of Book Launching written by the AIPI fellows to commemorate AIPI’s existence. Due to in “Bahasa Indonesia”, the books are given to Malaysia and Indonesian participants.

III.4. SESSION 2

Session 2 is moderated by **Prof. Zabta Khan Shinwari** from the Pakistan Academy of Sciences; Vice President, Islamic World Academy of Sciences; Professor from Quaid-i-Azam University, Islamabad-Pakistan

One keynote speaker and three speakers present their talk, they are:

1. The online keynote speaker is **Ms. Marielza Oliveira, PhD**. She is the Director for Partnerships and Operational Programme Monitoring Communications and Information Sector, from the United Nations Educational, Scientific and Cultural Organization (UNESCO). The title of her presentation is “*Information for All Programme (IFAP)*”.
- To achieve the sustainable development goals, participation in knowledge creation, sharing, and innovation sharing is needed to ensure that they are done to improve people's lives, not just wealth.

- Although technological and scientific progress offers economic growth, it also exacerbates inequality within and between nations.
- Scientific literacy has become a crucial navigating device in a rapidly changing world; thus, societies must be equipped with pertinent competencies.
- The supporting components of science, such as scientists and educational systems, should be strengthened to withstand digital transformation.
- Digital transformation, including Artificial Intelligence adoption, is changing how people function and has become a priority in every organization in the private and public sections.
- UNESCO plays a leading role in facilitating international cooperation and shaping a human right based digital future. While there are plenty of organizations and companies that are working to make computers smarter and more connected, for UNESCO, what matters is to make people smart and more connected.
- For that, UNESCO starts with digital literacy, a definition that contemplates tangible skills such as producing, using, sharing information in digital domains, including computational skills that focuses on how skills are used in real-life situations that encompass a learning process that is gradual and lifelong, and enables critical participation in different types of digital environments, from normal email to plain websites all the way to the metaverse.
- UNESCO's definition brings together media literacy, information literacy, and digital literacy to highlight the kinds of competencies that emphasize the development of research-based skills and the ability to engage meaningfully, with all forms of content sources and mediators, regardless of the technology that they use.
- UNESCO is working to address complex technology governance challenges, setting standards for artificial intelligence policy making, and ensuring inclusive digital technologies and policies and transformation for a brighter future.
- UNESCO is actually a standard center in the area of digital transformation. Our recommendations and guidelines, including on transparency of digital platforms, open science and open data, on the ethics of artificial intelligence, the ICT competencies for teachers, and others are flexible and adaptable instruments that can foster innovation while protecting accountability and rights.
- UNESCO develops an artificial intelligence and digital transformation competency framework for civil servants, to place all its tools to civil servants and asks to reach out to UNESCO.

2. **Prof. Narinder Mehra**; Vice Chair of the Indian National Science Academy (INSA); expert in Transplant Immunology and Clinical Immunogenetics, with “*Science Literacy in the Digital Era*”.

- The Indian National Statistics Office states that a digitally literate person is at least five years old and can navigate the internet via a web browser, using email, and find, evaluate, and communicate information using social media tools.
- Core components of the Digital India initiative:
 - Digital infrastructure creation
 - Digital delivery of services
 - Digital literacy
- Six common topics all digital literacy curriculum should include:
 1. Information literacy

2. Ethical use of digital resources
 3. Understanding digital footprints
 4. Protecting yourself online
 5. Handling digital communication
 6. Cyberbullying
- The digitalization in India 2019 report revealed that 99,9% of internet users in India used a mobile device to access the web. Age, gender, occupation, geography, caste, and other variables have also been shown to shape the diffusion of technology in India.
 - The digital tools introduced during the COVID-19 pandemic in India, has been proved critical in combating the virus and revealing their potential data collection aspect, which impacted policymaking. As a result, India attempts to build a digital health ecosystem through the Ayushman Bharat Digital Mission (ABDM).
 - Most transformative digital solutions do not accessible because they are blocked by copyright and proprietary systems and are unevenly distributed in terms of language, content, and infrastructure.
 - No global governance framework can ensure the interoperability across systems, address data security and privacy concerns.
 - G20 could become the apt platform to build a future-ready vision for digital health and other similar facets of life.
3. **Prof. Budi Wiweko** (online); Fellow of AIPI for Medicine Science Commission; Professor at the Faculty of Medicine, the University of Indonesia. His talk includes “*Digital Literacy in Health*”.
- Three important things that will disrupt healthcare providers and systems within the next 20 years: Generic medicines, Digital medicines, and AI and Robotics.
 - The role of digital technology will be more important in delivering health services in the future.
 - Technological progress in the health sector could inform people on what course of actions to take regarding their healthcare needs. It could also assist in further testing and experimentation on a variety of problems.
 - Mobile health applications could spread knowledge and improve the precision of knowledge already possessed by the user; digital support groups could also provide an alternative source of information.
 - Establishing a big data center could promote the importance of data and the spread of knowledge by providing the needed infrastructure to disseminate knowledge which is crucial in the digital age.
4. **Prof. Dr. KOIKE Toshio**; the Executive Director, International Centre for Water Hazard and Risk Management (ICHARM), Public Works Research Institute (PWRI), Tsukuba, Japan. His talk includes: “*Integration of knowledge and capacity towards building sustainable and resilient society by all*”.
- Human loss due to disasters mostly occurs in the lower-middle and low incomes countries.
 - Economic loss occurred to upper middle and high incomes countries. However, relative to GDP, the most affected were still the lower middle and low incomes countries.

- The Science Council of Japan recommends that the scientific community should develop the Online Synthesis System (OSS) to promote Disaster Risk Reduction (DRR) and Sustainable Development, and it should foster for facilitators.
- Facilitator not just as "masters of ceremony" but as "catalytic beings" who can establish the relationship in communities, explain causes and structure of problems and its local implications, and suggest goals and solutions to stakeholders, and convince communities.
- Online Synthesis System could assist facilitators in reaching out to communities by providing the opportunity to connect society in general with scientific communities, which would allow novel generation of knowledge.

III.5. SESSION 3

Session 3 is moderated by **Prof. Narinder Mehra**, the Vice Chair of the Indian National Science Academy (INSA) and expert in Transplant Immunology and Clinical Immunogenetics. Five speakers present their talk, they are:

1. **Dr. Aristotle Carandang**; the Director for Institute of Indigenous Science, Technology, Arts & Society, Philippine Women's College of Davao, Davao City, Philippines. His talk is "*We Are What We Do*".
 - The digitalization of the Reference for Emergency and Disasters (RED) book has been done, which includes the educational posters on disasters to reach more people.
 - According to the data from Macrotrends, the Philippines' population will increase and according to the United Nations projection the population rate will not go down until 2100.
 - The number of internet users in the Philippines has increased over 11 years from 2013 to 2023, for about 85.2 million people are connected.
 - The reason for using the internet in the Philippines at the top is to find information, almost the same numbers as staying in touch with friends and family.
 - Despite the high percentage of internet users to find information in the Philippines, however the information about interest in science is few or non-existent.
 - The Philippines used the penta-helix model for cross-sectoral collaboration, including the media as one of its sectors.
2. **Dr. Johannes Haryatmoko** (online); Fellow of AIPI for the Culture Commission; Senior lecturer at the University of Sanata Dharma Jogjakarta; with a talk of "*Digital Era: Educator's Mindset Change for the New Learning Models*".
 - The education system must keep up and change to keep up with the changing demands of the innovation era.
 - The trend of workforce availability in agriculture, blue-collar, and white-collar workforce demands are declining; while the workforce in services remains, and the creative workforce is rising.
 - The analytical and critical thinking competency is required to develop the skills needed to meet the demand in the digital era.

- A change in educators' mindset and role must occur to facilitate learners in their educational pursuits, and a better learning model must be implemented to support the needs of learners.

3. **Prof. Dr. Abhi Veerakumarasivam**; the Provost of Sunway University of Malaysia; Chair, International Network for Government Science Advice Asia (INGSA-Asia). His talk includes "*Bridging the Trust Deficit: Embracing Our Social Responsibility, Enhancing Science Literacy*".

- Despite the erosion of trust in many societal sectors, scientists are still more trusted.
- Mal-information, separate from misinformation and disinformation, is the manipulation of information with the intent to harm and is quite real.
- It is important to establish methods and tools to examine and distinguish inaccuracy in scientific claims because it affects how individuals -both in the science community and elsewhere- form their perceptions of risks, thereby, their decision-making.
- The data might be translated into something other than good information, impacting the kind of knowledge it derives.
- In a post-normal world, the demands put on scientists and their disciplines expand, requiring more significant efforts and cooperation to address.
- The measuring devices and values applied to determine good researchers and research studies might need to be updated in identifying research that has an actual impact in the generation of knowledge.

4. **Dr. Nguyen Tuong Lan**; the Manager of S&T Development of Forecasting Department, Institute for Scientific Information, Vietnam Academy of Science. Her talk consists of "*the digital Transformation Program in Vietnam Academy of Science and Technology*".

- The national digital transformation in Vietnam refers to a model driven by the changes with the application of digital technology in all aspects of human society.
- The digital transformation in Vietnam targets the digital economy to account for 20% of Vietnam's GDP in 2025, by targeting businesses that want to adopt digital transformation to improve their efficacy.
- The program includes other goals by 2025 ranging from finance and banking, healthcare, education, agriculture, transport, logistics, energy, natural resources, environment, and manufacturing, also parts of the national administration services.
- The Vietnam Academy of Science and Technology (VAST) in its digital transformation program up to 2025 aims to improve operational efficiency and effectiveness, develop the digital economy, and ensure information security.
- To improve operational efficiency and effectiveness, VAST intends to almost entirely adopt a digital approach where many of the workloads are done in the digital environment.
- While developing the digital economy, VAST intends to build and submit a project to launch a high-performance computing and data storage center which would contribute to developing the digital economy and digital society in Vietnam.
- On ensuring information security, VAST intends to rank and adopt a plan to ensure information security, training all of its staff on information safety and security, and strengthening the application of modern IT equipment and security technology following the

4-layer model, to ensure network safety and security and VAST's information system to operate smoothly 24/7.

5. **Dr. Melanie Hughes**, the Curriculum Specialist in Technologies; and **Dr. Simon Collier**, the Curriculum Specialist in Science (online); the Australian Curriculum Assessment and Reporting Agency (ACARA). Their talk consists of “*Digital Literacy in the Australian Curriculum: A Focus on Science and Digital Technologies*”.

- Developing science literacy enables students to engage meaningfully with contemporary issues, evaluate points of view, and make informed decisions.
- The Australian curriculum encourages interest in scientific elements from early in the education process.
- 3 Dimensions of the Australian Curriculum:
 - Learning areas
 - General Capabilities
 - Cross-curriculum priorities
- Science, digital technologies, digital literacy, and sustainability are the essential components of science literacy in the digital era.
- The application of digital technologies in transforming science-based data into engaging educational tools which could improve interest in science and science literacy.
- The science curriculum is divided into three categories:
 - Science inquiry
 - Science understanding
 - Science as a human endeavor

Q & A in the Discussion Session

Q: What kind of security issues do you think about regarding science literacy in the digital era?

Dr. Hughes: In the curriculum, we have as general capabilities ethical understanding, and we also, through digital technologies, teach students to think about privacy and security of data so that they handle data ethically. They collect the data ethically, and they consider whose data it is and where it should be stored and how it should be shared and whom with. So, these are all important considerations. I think specifically when we talk about scientific data, we also have considerations about where the data is sourced and whether that data is true and valid data and is peer-reviewed.

Q: How does the Jakarta Healthy Reproduction program help women know about their reproductive health?

Prof. Wiweko: These programs have released by us, to be designed to empower women, particularly assisting in family planning. By using these mobile applications, we hope they know well when to start a family, when to get married, when the appropriate time to conceive, and also very importantly the pregnancy in a healthy condition, to plan for their future of human resources in Jakarta.

Q: I am sure the patient always has that curiosity in their mind to go for a second opinion or third opinion that can now be obtained within a matter of minutes rather than waiting for days or weeks.

Prof. Wiweko: Yes correct, this mobile application also provides young women with knowledge about healthy reproduction and sexual reproductive health and rights which is very important for the generation.

Q: I want to ask Dr. Johannes, who talked about the educator's mindset change, and already we see the class when I go to take a class when I used to go to take a lecture, say three decades ago the house used to be all full nowadays more than half of the students are not there because they think whatever you are going to talk about they might as well see in their hostel room only how is this, I mean you talked about the mindset change in the digital era?

Dr. Johannes Haryatmoko: I think, for instance, with the flip learning the student is not in school most part the activities are outside of the room, in the room they will give a kind of problem-solving case and so with the internet I think now quite a lot of resources to learn something, I think what is called the offline things will be in decline, and people will study more independently. That is why with ChatGPT we are as lecturer not afraid because ChatGPT in bloom's taxonomy will only replace up to the fourth level and unable to replace the fifth and sixth level, and so the lectures should focus on the fifth and sixth level in the bloom's taxonomy to hold their role in educating students.

Q: My question is for Aristotle who talked about we are what we do could you elaborate a bit more on that?

Dr. Aristotle Carandang: We are what we do is a focusing now on the more marginalized people because they are the most vulnerable they have no access to almost everything from healthcare to sanitation to the internet and most of the time though not every time they are taken advantage by the more educated of us, it's quite sad because they give their full trust and it's something that we discovered while we immersed ourselves in the communities, it has come to the point that they no longer trust researchers because of the previous that had visited them and have not come back for whatever reasons, and yet nothing was returned to them. That's where we come in, maybe what they call magic is what we call science, and that's what we looked into deeply.

One concrete proof of this is the ethnical community of Matigsalug which, if translated, means "people from the river," and yet their problem is water. It's too ironic. They thought that all the illnesses and the water-borne diseases they experienced were because of the angry spirits, but when we presented the magic of science, they understood fully. Now they test their waters, are empowered, and have learned the basics of having clean potable water through our water system.

Comment: I think we can end up by making one statement; let us use this digital literacy technology and take it to the rural household or marginalized communities everywhere. Digital literacy would be helpful since they cannot come to the classroom. Maybe the digital way could be used to educate them as well.

III.6. SESSION 4

After 15 minutes coffee break, Session 4 starts with **Prof. Dr. KOIKE Toshio**; Executive Director, International Centre for Water Hazard and Risk Management (ICHARM), Public Works Research Institute (PWRI), Tsukuba, Japan, as the moderator. Five speakers are invited to talk:

1. **Prof. Pavel Krestov** (online); the Director of Botanical Garden Institute, Vladivostok – Russia; Vice-President of Far Eastern Branch of the Russian Academy of Sciences; the title of his talk is “*Climate Change and the North: What We Need to Take with Us into (let’s say) Year 2070*”.

- Big data sets open great opportunities to understand our global flora's state and identify evolutionary patterns and trends. So, in combining big data sets and artificial intelligence might allow us to predict different changes in the world flora.
- In making big data about plant systems, the main constraint of biologists is the low number of people capable of collecting data in the field. Through applying big data and artificial intelligence in studies, biologists can enhance their decision-making in formulating strategies for the future.
- During an assessment of the impact of a tropical cyclone causing rock slides in southern Russia where the forest was devastated in 2016, remote sensing data was broadly employed, and the neural network named Convolutional Neural Network (CNN) was trained to recognize windstorm damages and was combined with ultra-high satellite imaging through deep machine approaches, which produced good data.
- The world is changing rapidly, which prompts strategic decisions in planning to be made quickly. The role of scientific literacy is becoming more important, the use of big data and artificial intelligence, which allow precise and quick information gathering, would allow decision makers to keep up with it.

2. **Prof. Dr. Anjana Singh**; Academician, Nepal Academy of Science & Technology (NAST); Central Department of Microbiology, Tribhuvan University, Kirtipur, Kathmandu, Nepal. Her presentation covers “*University Experience in Science Literacy in the Digital Era*”.

- Digital literacy in science is the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills.
- During the pandemic era of COVID-19, digital literacy has become crucial in promoting awareness and healthy behavior to the public through various creative approaches.
- Science literacy was also crucial in avoiding misinformation and promoting awareness within individual and collective decision-making.
- Few students faced problems in digital literacy in science due to poor network, unscheduled power cuts, and few of them did not have gadgets. Besides, teachers also faced challenges running the online classes, which cause mental fatigue.
- Some science students say face-to-face is more effective due to the practical courses requiring tools that may be unavailable.

3. **Prof. Suhono Harso Supangkat**; Director of Smart City and Community Innovation Centre, Professor from the Institute Technology of Bandung, with a talk of “*Digital Literacy Improvement through Living Lab*”.

- The supporting facilities in cities are limited in accommodating the rising of urban population. The research and rating of digital transformation of cities in Indonesia showed that the situation is very far from the ideal conditions, which are rated as follows:
 - Ad Hoc - least
 - Existence
 - Survival
 - Mature
 - Transformed - most
- Based on the survey of digital literacy status in Indonesia by the Ministry of Communication and Informatics in collaboration with Katadata Insight Center (KIC), the status on a scale of 1-5 is 3.54.
- The Smarter World Living Lab is a concept used to develop smart cities by designating smaller components of a city to observe and implement changes, in which the impact and scale would be more manageable and easier to be measured.
- The way that the Smarter World Living Lab aims to achieve its goals is by utilizing five components which are:
 - Open Innovation
 - Real Life Environment
 - Multi Stakeholder's Participations
 - Co-Creation
 - User Engagement

4. **Mr. Firdza Radiany**, from Pandemic Talk, UNICEF Indonesia, with his talk of “*Pop Science Contents*”.

- The difficulties of providing scientific contents on the social media in Indonesia lies in the behavior of the people using it. Algorithmically, science contents will lose when compared to the contents of gossip, politics and sports.
- In Indonesia, experts provide scientific education in social media like they are writing a thesis, so less attractive. Experts and scientists should learn that the structure of educational content in social media differs from teaching on campus.
- Indonesia has three pillars of scientific literacy: governments, academics, and ordinary people. Due to the ineffective communication links between the three pillars, the intermittent connections were disrupted with hoax, anti-scientific, misleading and conspiratorial information.
- To encourage scientific literacy in netizens, scientific content must be packaged in an easily consumed, attractive and digestible format.
- Using storytelling in presenting scientific content could make its consumption is more accessible and more appetizing.

5. **Dr. Zulfa Zhakiyya**; the fellow of the Indonesian Young Academy of Sciences (ALMI); from the State University of Semarang. Her talk covers to “*Literacy and Scientific Temper: What is missing? What can be improved? What does it take?*”.

- The root of the problem regarding digital literacy in Indonesia lies in the unequal redistribution of resources. The data on internet penetration in Indonesia shows that 75% of internet penetration occurs in Java and Sumatra, and the rest is spread across the archipelago.
- The scientific temper central to scientific inquiry and observations need to be included in spreading scientific literacy in Indonesia.
- Students could be weaned through project-based learning to develop their scientific temper and improve their scientific literacy. Scientific, social, and school environments should be shaped to build scientific literacy.

Q & A in the Discussion Session

Q: How to identify the gap in society and try to fill the gap to solve the problem?

Prof. Supangkat: In our experience in the intelligent city living levels how to engage between the society and innovator, we invite, for example, a medium enterprise people, then we make a question about our innovation with the incentive of digital payment, then we try to understand the level of literacy of the people, and then we organize small training to explain our innovation and also how to implement, but not so easy because of the education of small and medium enterprises are very low, so we must carefully explain about our innovation and technology in real life, this is our challenge to connect our innovation and people.

Q: Sakhiyya proposes a learning framework for fostering the scientific temper does that thesis make an essential point for your living lab, do you have any similar experiences or solution to foster the scientific temper in the community?

Prof. Supangkat: The gap between people as a trendsetter in our city is based on the education of the player in the small and medium enterprises and also the government as the authority is also essential to make policy for shaping the small area in the smart city, between government, innovator, and also the society as the implementation must communicate better. Also, government literacy to implement, deploy, and adopt the technology is a challenge in regional development.

Q: How to share such integrated scientific knowledge with the community?

Prof. Krestov: Because we share the same ecosystem and climate in Asia, sharing findings and scientific data is imperative between nations. The interconnected nature of our shared ecosystem and climate should be apparent to influence societal change.

Q: Professor Anjana, through your experiences, do you have any ideas or comments regarding improving digital communication compared to face-to-face interactions?

Prof. Anjana Singh: The limited supporting infrastructure for digital interactions, such as power cuts and limited connections to the internet, hampered our educational process. 50% of the students also stated that they encountered difficulties when it came to the more practical part of the process. Still, other parts, such as submitting reports and sharing manuscripts, were made easier with the online system.

III.7. SUMMING UP DAY 1

The seminar of Day 1 is summed up by **Prof. Dr. Manoj Kumar Patairiya**, the President of International Science Writers Association - New Delhi, India; Former Chair of SHARE Communication; together with **Ms. Dyah R. Permatasari**, the CEO of DoctoRabbit Science.

- It is essential to bridge between the scientific community and society at large, to hasten the information and communication of public understanding.
- Digital means of communication is to enhance science literacy and to achieve the goals of our forerunners in making science more accessible to the public.

IV. DAY 2, 21st JUNE 2023

IV.1. KEYNOTE SPEAKER

The Keynote Speaker for Day 2 is **Prof. Hak-Soo Kim**. He is the Life Member of Public Communication on Science & Technology (PCST), and Former Chair and Founder of AASSA Special Committee on SHARE Communication. His speech is “*Science Literacy for Problem Solving*”.

- We need to develop science for problem solving because it has become more and more fundamental today.
- There are two kinds of problems:
The situational problems: WHAT problems? The examples: situational troubles, threats, risks, etc. what problems?
The behavioral problem: HOW (to do) problems? For examples: steps, procedures, performance, etc.
- New science literacy is needed for: science of needed behavioral architecture (Theory FOR), such as: ever-intelligent, ever-ideational, ever-problem-solving, ever-beyond-AI.

Q: Essential of the behavioral architectures are minding to moving. How about encouraging for next step?

A: Not always. Minding examples focusing attention, questioning, imagining, constructing. And moving are facing, acting, and putting ideas into action.

IV.2. SHARE COMMUNICATION

The session is moderated by **Prof. Dr. Mehmet Emin Aydin**, from the Turkey Academy of Sciences (TUBA), and Professor from Necmettin Erbakan Üniversitesi, Konya – Turkey. Six speakers share their ideas and information.

1. **Dr. Finarya Legoh**; Chair of Special Committee on SHARE Communication, and Senior Lecturer at the Faculty of Engineering, University of Indonesia. She informs the audience about “*Introducing AASSA Special Committee on SHARE Communication*”.

- At first, the Committee started with SHER Communication (Science, Health, Environment and Risk), then has added with “agriculture” to become SHARE. R&D activities should be able to deliver not only their technical publication, but also their practical implication with special emphasis on the industrialization and commercialization of the R&D outcomes.
- It is important that scientists keep full integrity when they publicize their R&D products and watch for fake, fabricated products.
- Science breakthrough is effective by using social media, as many people nowadays using social media and internet to seek information about everything.

- Fake news raises various problems which can even cause horizontal conflicts, business losses, and social problems to national problems.
 - To overcome this, needs to educate public to get the proper information from the trusted sources. Strict arrangements are also needed.
2. **Prof. Manoj Patairiya**; the President for International Science Writers Association, New Delhi, India; Former Chair of SHARE Communication. His presentation covers “*Science Communication in the Age of AI: Opportunities, Challenges and Strategies*”.
- Science communication is the key to the real treasure of scientific knowledge, only by which the benefits of science and scientific temper could be carried to the common man, and thus the common man is benefited with the new advancements in various fields of science and technology.
 - The program elements divided into: training, software development, research, field programs, etc.
 - Use of all kinds of mass media, such as: printed, broadcast, digital, folk, interactive; as well as various digital form: graphic, video, music, etc.
 - Advantage of digital media: low cost or no cost, offers two-way communication, encourages public participation, use of regional language, etc.
3. **Dr. Vishnu Pratap Singh**; the Academic Coordinator of Training Course in Science Journalism, National Council for S & T Communication, Department of S & T India. His presentation covers “*E-Training Course in Science Journalism*”.
- E-training involves the use of a computer or any other electronic device to provide training or educational material.
 - Science journalism conveys reporting about science to public, the field typically involves interaction between scientists, journalists, and particular public.
4. **Dr. Inaya Rakhmani**; Honorary member of Indonesian Young Academy of Sciences (ALMI); Director of the Asia Research Centre, Universitas Indonesia. Her talk is “*Communicating Social Science in Digital Times*”.
- The background:
 - Digital society: algorithms, filter bubbles, echo chambers.
 - There is a disconnection between scientists and their public, which this disconnect is not new regarding hierarchies vs networks.
 - Universities and state/government research bodies are bureaucratic. Public are ideally egalitarian, open, specifically so in democratic contexts.
 - Social media and the networked model: collapsed, direct, social media, etc.
 - Against this background, as scientists more generally and social scientist more specific, communicate our research, and synthesis?

- Insights:
 - Structure of social media algo homogenized.
 - Polaris Tires the marketplace of ideas.
 - Challenges scientists to converse and discuss our work in interdisciplinary ways.
 - To communicate our findings to the relevant public.

- Science communication as a strategy:
 - Digital literacies are technical solution to structural problems.
 - Digital and wealth inequalities / divides.
 - We need to problematic these inequalities in our work, and discuss openly with amateur professional (vloggers, podcasts, graphic animators).

5. **Mr. Ahmad Nurhasim**; Science and Health Editor for the Conversation Indonesia. His talk is about “*Science Communication in Indonesia: Progress and Challenge*.”

- There are challenges to develop science communication in Indonesia, such as:
 - Lack of knowledge and skill on science communication.
 - Regulation matter of university, ministry of education, grant provider.
 - Academic culture.

- We should unlock the knowledge of researchers and academics to provide public with clarity and insight into society. If knowledge production increases, so is less sci-comm; if lack of capacity and regulation, will be less support.

6. **Ms. Dyah R. Permatasari**; the CEO of DoctoRabbit Science, her talk covers “*STEAM Education in the Digital Era*”.

- STEAM education is designed to stimulate critical thinking of students.
- The main principles are: student centered, problem/ project-based learning, multidisciplinary integration, contextual, and collaborative work.
- We have challenges in implementing STEAM education in Indonesia, such as: teacher preparedness, student preparedness, professional development, and laboratory facilities.
- Digital tools could help to make STEAM education more effective, as the STEAM education are varies, consist of: robotics, coding and programming, 3D printing, virtual simulations, artificial intelligence.

IV.3. PANEL DISCUSSION: FIRESIDE CHAT ON DIGITAL LITERACY COMMUNITY

The panel discussion is moderated by **Dr. Haryanto Halim**, Chair of National Education Foundation of Karangturi, Semarang; with four panelists from different background and professionals. They are:

1. **Dr. Ardi Sutedja**; Chief of the Indonesia Cyber Security Forum.
2. **Dr. Ganigar Chen**; the Vice President of National Science Museum, Pathum Thani, Thailand.
3. **Prof. Abhi Veerakumarasivam**; Provost from the Sunway University of Malaysia, also a representative from INGSA-Asia.
4. **Dr. Ayom Widipaminto**; Director for Repository, Multimedia & Scientific Publishing, the National Research and Innovation Agency (BRIN).

The discussion is intense and lively, talk about:

- When using digital applications and tools, you have to be aware of the fast development of upcoming technology. For example, AI is able to using your face or voice now, and it can be used to trick other people.
- The ethic in this digital era, especially in data sharing, is consent from the person who owns the data. However, we need to think more about ethics as it is still risky for the audience related to cybersecurity (how to protect us related to cybersecurity).
- Senior citizens also need digital literacy and refresh their information and knowledge to be able to use digital literacy.
- Local wisdom can be applied to encourage local people in socializing science literacy.
- You cannot solve cybersecurity with regulation, because we need to pay attention to people (related with other people's lives) and business perspectives (economic sides).
- We should not limit technology development. In this digital era, some restrictions of using social media / digital tools like what China did is not always right. China has a different structure in politics and we're not going there related to technology development in Indonesia. People need to explore technology, keep innovating, and doing more to go anywhere further. However, the important thing is we should always rely on ethics.
- We cannot afford the use of technology in the digital era, so critical thinking is a must. We have to be able to gather the right information and make the right decision (problem solving). In the future, we all know that we will be overwhelmed with so much information in digital technology, so we need to know how to choose the proper information. This is the key. We need to find a connection between science education where we cultivate the scientific mindset and science communication where we make the information relevant to people.
- Science literacy is global, but Indonesia has a special condition. So, we need to customize, considering the local needs and local advantage for each county.

IV.4. SUMMING UP DAY 2

1. From Prof. Kim's speech about science literacy for problem solving, he emphasizes that we always continuously fail because we put science first, besides we need behavioral structure. He came up with a theory with 4 "evers": ever intelligent, ever ideational, ever problem solving, and ever beyond AI.
2. Dr. Finarya Legoh shares about the journey of science communication activities within AASSA Committee, the transition from SHER to SHARE communication. She comments that arranging a kind of face-to-face seminar is not an easy task, so she suggests that a hybrid or online seminar can be a solution to ease the arrangement.
3. Prof. Manoj Patariya shares about the experience in developing science communication in India environment, while Dr. Vishnu P. Singh shares about science journalism in India and its engagements.
4. Dr Inaya Rakhmani talks about the difference of social and economic conditions brought about by social media, and Mr. Nurhasim shares about the experience of science communication, challenge and progress in Indonesia, from the perspective of popular science information shared by the Conversation Indonesia.
5. Ms. Dyah R. permatasari stresses the importance of STEAM education, which is designed to stimulate critical thinking of students.
6. The panel discussion mentions the collective responsibility and collective accountability, where both must be balanced, in using and sharing the science literacy in digital media.

The recommendation of the seminar is prepared by **Prof. Hak-Soo Kim** and **Dr. Aristotle Carandang**, stated as:

- The discussion should be continued. Previously in the panel, we talked about collective responsibility and other important items that we should deal with it later. The SHARE Committee should continue the discussion.
- Transfer of technology (digital technology) not only make our live easier, but also make our live more complicated, full of uncertainty and complexity. So, we need science communication to reduce the risk of the threats.
- More online programs will be organized because it is not easy to meet together off-line.
- We should encourage and a force of collaboration programs research projects among member countries on science literacy, workload networking for collaboration in the future.
- Global initiative should be taken to expand the horizon.

V. CLOSING OF SEMINAR

The Presidents of both AASSA and AIPI close the Seminar that have been implemented throughout the two-day event continuously on 20-21 June 2023 with hybrid platform.

Prof. Nuri Yurdusev

For the closing at the end of seminar, Prof. Yurdusev stresses the important focus of the seminar, which topic has the interdependency matters between science and science communication, and goes hand in hand with science and digital literacy.

The talks and the works point out different perspectives and point out the beneficials, open the horizon of science literacy, digital media and science communication, which I myself learn a lot from this seminar.

AASSA will continue to support the SHARE Committee and members, as given in the past for various activities of science communication. AASSA also opens to all suggestions, gives supports to initiatives regarding science communication and literacy, as far as the work and the funding is eligible.

Such meetings are good for not only gathering and exchange ideas, and not always for the scientific purposes, but also for other options and we need to meet old and new friends, broaden the family network of AASSA.

He encourages all audience to talk to their academies, as some of academies have been actively coming to the seminar as speakers, but AASSA also suggests that the academies should also take part in organizing the events, that the AASSA members and stakeholders can meet. So that AASSA is more noticeable to the member academies.

Prof. Yurdusev thanks for all the contributions and thanks to AIPI and the team for realizing the seminar with hard work, professionalism, to make it all possible. He pleases the audience to give applause to the success of the seminar.

Prof. Satryo Soemantri Brodjonegoro

In this closing, Prof. Satryo S. Brodjonegoro as the host organizer of the seminar, conveys his grateful once again for the audience presence, support and contribution in the seminar during the two consecutive days on 20-21 Juni 2023.

This seminar is a long journey of SHARE Communication since 2015, of the concerted efforts from each member of the Committee as well as members whose have passion in nurturing SHARE Communication; where the noteworthy recommendation yielded from each seminar and workshop are significant for today's activities. He is glad to be the part of nurturing that long journey too

since 2015 and hope that the issues generated and recommendations proposed will find a room on action plans of each academy, because they are inter-connected globally.

He appreciates the SHARE Communication speakers who have passion in different and various path, but at the end the objectives and output are accumulated to the well-being of nationwide. We must learn to use of the digital technology development without being trapped in it, and how we should always consider the ethics and threats by using its applications.

As the Vice-Chair of AASSA, Prof. Satryo personally convey his sincere appreciation for the valued contributions and supports from the attendees and speakers, the passion following the dense program, for the friendship to make the seminar lively and happy. He hopes that the deep commitment and the essential recommendations outlined in the seminar should be progressing, and build a collaborating program within members.

He then congratulates to the success of this lively seminar, and expresses the deepest gratitude to all parties who have contributed to the seminar: IAP, AASSA, Kominfo, Perpustakaan, and organizing committee, who work effortlessly to realize the seminar successfully.

VI. SUMMARY

The seminar's objectives address the strategic objectives of Inter-Academy Partnership in promoting the importance of science in research, education, and literacy, such as: promoting high-quality, responsible, open, transparent and inclusive research; communicating and disseminating academy initiatives and outputs in innovative, creative, and accessible ways; supporting activities that foster the next generation through collaborations with the national young academies; promoting public engagement in and appreciation of science, medicine and engineering. The objectives also connected to several SDGs goals: Good health and well-being (SDG 3), Quality education (SDG 4), Industry, innovation and infrastructure (SDG 9), and Reduced inequalities (SDG 10).

To convey the content of seminar resonates strongly to stakeholders and regional networks, AIPI decides to organize seminar in a hybrid mode. So that the message of seminar can be delivered online and in-person in a large coverage area and capture more desired participants, especially abroad. The call, circulation and promoting of seminar are delivered to AASSA members, stakeholders and organizations related to the theme of seminar. The recommendation serves collaborative action plans and should be pursued in supporting sustainable and inclusive growth across the globe, as science and technology is important enabler to the quality of life improvement.

The Special Committee of AASSA in SHARE Communication (Science, Health, Agriculture, Risk and Environment) assists the seminar in formulating the catchier and more interested theme of the seminar, which can be related to science communication as a basis empowerment of science literacy. The formulation also broadens the topic into benefit, threat, misinformation, hoaxes, and advantage & threat of Artificial Intelligent, such as: ChatGPT.

In a wide range of impact, public policies and decisions are highly dependent on the availability of scientifically-based data analyses. Taking the example of the COVID-19 pandemic which is handled at a local and global levels differently, but the determinants involve the most relevant

data and infrastructure to deal with the disease, the involvement of R&D and supported information, as well as on the social economic of health and wellness.

The position of Science Academies as a prestigious organization and fellows with knowledge resources can lead the capacity building in the region. So that through AIPI and stakeholders support, the capacity building within and outside institutions can be disseminated within the targeted community and areas. AIPI is the auspices of the Indonesian Academy of Young Scientists (ALMI), the Indonesia Science Fund (DIPI), and the Conversation Indonesia. They are extended supports of AIPI in programs and activities, in which the proxy in reaching various speakers and participants.

Moreover, the program gets beneficial by engaging and gain support from the international organization as speakers, such as from UNESCO, WOSL (World Organization in Science Literacy), PCST (Public Communication on Science & Technology), various experts from AASSA members and others, as well as strong government institutions responsible for digitized science literature. The resonance of seminar is stronger and louder in the local Indonesia and regional areas. The Ministry of Communication and Informatics has the responsibility to accelerate the digital literacy with its internet access, while the National Library as the center of local libraries hastens the program of digital literacy. The support of the two strong national institutions emphasizes the objectives of seminar.

The Ministry has several programs connected to accelerate digital literacy to public regarding knowledge, access and training. These programs are supported with many resources and ease us when collaborating with the Ministry. The National Library has branches in 38 provinces in Indonesia. By collaborating with the National Library and broadcast the seminar in a hybrid platform, AIPI could reach and disseminate the seminar and its important contents to all provinces, and AIPI could be the think tank of them.

The social media and web-based method play an important role to disseminate and promote the seminar as well as the digital literacy (with science content). The approach of press release and invite online newspapers and newsrooms are a helpful communication strategy to reach participants as well as disseminate the output. Social media platform such as: Facebook, YouTube, Instagram, WhatsApp, are used to open the channel of seminar as well as to educate public on science literacy.

The keyword is actually collaboration as many as we can to gain interaction with science literacy and how we could gain benefit of it, while disseminate the knowledge to society at large.

VII. ORGANIZING OF SEMINAR

Date and duration	: Hybrid seminar, 20-21 June 2023
Place	: AIPI Premises at National Library Building, Jl. Medan Merdeka Selatan 11, Jakarta
Participants/ Speakers	: Government bodies, international bodies and associations, researchers, educators, communities, etc.
Language	: English

ORGANIZERS

The Indonesian Academy of Sciences (AIPI) was established in 1990 by the Law of the Republic of Indonesia No. 8/1990 on the Indonesian Academy of Sciences. It is an Indonesia's independent body that gives opinions, suggestions, and advice to the government and society on the acquisition, development and application of science and technology. It organized into five commissions: Basic Sciences, Medical Sciences, Engineering, Social Sciences, and Culture. AIPI promotes science through scientific conferences and policy discussion forums, publications, national and international relations, and other activities (www.aipi.or.id/).

The Inter Academy Partnership (IAP) is the global network of science, engineering and medical academies working together to provide independent expert advice on scientific, technological and health issues. Under the umbrella of IAP, more than 140 national, regional and global member academies work together to support the vital role of science in seeking evidence-based solutions to the world's most challenging problems. IAP harnesses the expertise of the world's leading scientific minds to advance sound policies, improve public health, promote excellence in science education, and achieve other critical development goals (www.interacademies.org).

The Association of Academies and Societies of Sciences in Asia (AASSA) was established in 2012 through the merger of the Association of Academies of Sciences in Asia (AASA) and the Federation of Asian Scientific Academies and Societies (FASAS). The aim of AASSA (www.aassa.asia) is to promote solidarity and cooperation among the scientific and technological academies in Asia and Australasia, and to play a central role in collaborations to further develop the region through science and technology. One of AASSA Special Committee is SHARE Communication (Science, Health, Agriculture, Risk, Environment) which takes part in organizing the seminar. AASSA is one of the four Regional Networks of IAP.

The Ministry of Communication & Informatics (Kominfo) has the task of organizing government affairs in the field of communications and informatics. One of the functions of the Ministry is formulation and stipulation of policies in the field of resource management, postal and informatics equipment and operation, management of informatics applications, and management of public information and communication (www.kominfo.go.id/).

The National Library of the Republic of Indonesia (Perpusnas) carries out governmental duties in the library sector in accordance with statutory provisions, such as: establish national, general and technical policies for library management, fostering cooperation, developing national library standards. Its functions among others are: assessing and preparing the national policies of libraries and determining the information systems provided (www.perpusnas.go.id).

Advisory Committee Chairs

Prof. Satryo Soemantri Brodjonegoro (President, AIPI)

Prof. Nuri Yurdusev (President, AASSA)

Mr. Samuel Abrijani Pangerapan (DG for Application of Informatics, Kominfo)

Mr. Muhammad Syarif Bando (Head of National Library of Indonesia)

Members

Prof. Hak-Soo Kim (Founder of SHARE Communication)

Prof. Manoj Patairiya (Former Chair of SHARE Communication)
Dr. Bonifasius W. Pudjianto (Director of Informatics Empowerment, Kominfo)
AASSA Special Committee on SHARE Communication

Organizers

Dr. Finarya Legoh (International Relation & Funding, AIPI / Chair for Special Committee on SHARE Communication, AASSA)

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(doctoRabbit Science)

VIII. DELIVERABLES OF SEMINAR

The deliverables of Seminar consist of:

- Recommendations following the closing of Seminar, drafted and circulated to the team of committees, to the final one – will be circulated to AASSA members, stakeholders, and asked to be disseminated to respective institutions.
- Policy Brief about the issue to the Government and related organizations, following the Recommendations.
- E-Proceeding of the Seminar.
- Designed material for: certificates, flyers, short introduction of Seminar which was put in the social media and website.
- Dissemination on information of Seminar and by invitations to Universities and R&Ds, stakeholders, and blasting the News in the social media such as Instagram, Facebook and website of AIPI and stakeholders, which the online attendees came to and left from the Webinars.

Dissemination on Information and News about Seminar at Social Media

The dissemination and promotion about the Webinar are executed through social media such as: Facebook, twitter, Instagram, YouTube, website of AIPI and partners. Besides, the invitations attending through particular invitees are disseminated through email and WhatsApp, and a few through personal letters.

The advantage of organizing the hybrid seminar relies on the dissemination and promotion of the Seminar information. This is done by the application of social media and ICT for promotion. The attendance can be gathered as many as possible of the capacity of the Zoom platform, as far as the attendees are situated within the availability of different time zone, while the rest of capacity can be allocated in the YouTube. The information consists in English and Bahasa Indonesia.

YouTube Day 1: <https://www.youtube.com/watch?v=xiFz--RGZao>

YouTube Day 2: <https://www.youtube.com/watch?v=IoaaPpGdRHI>

(with 1,390 subscribers)

<https://aipi.or.id/frontend/news/read/4245426f4b5470706d43334c2b38486567442b36726449596a4f684f7567734c656455586946596d547437764b7a6b6f4b756a4c666154466c317041617949423734313144584e6c584c4b384a3872735a5637446d673d3d>

<https://www.interacademies.org/event/digital-science-literacy-betterment-humanity>

<https://en.antaranews.com/news/285801/reading-culture-vital-to-boost-development-national-library>

<https://www.scribd.com/document/655195079/SeminarProgram-ScienceLiteracy-in-Digital-Era>

<https://twitter.com/ConversationIDN/status/1669677345257693185>

<https://voinews.id/index.php/component/k2/item/26193-science-literacy-is-important-in-a-digital-era>

<https://tuba.gov.tr/en/news/aassa-meeting-on-scientific-literacy-in-the-digital-age>

<https://perpusnas.go.id/en/berita/dukung-pengembangan-literasi-sains-perpusnas-sediakan-beragam-konten-digital>

<https://www.radarbogor.id/2023/06/20/literasi-sains-di-era-digital-sangat-penting-ini-alasannya/>

<https://www.rri.go.id/index.php/iptek/266837/kepala-perpusnas-literasi-dapat-meningkatkan-income-perkapita>

<https://www.antaranews.com/berita/3598062/kaperpusnas-budaya-membaca-penting-tingkatkan-pembangunan-nasional>

<https://rm.id/baca-berita/nasional/176759/budaya-literasi-penting-untuk-hadapi-perkembangan-teknologi>

<https://beritakota.id/ini-upaya-perpusnas-dukung-literasi-sains/>

<https://suarapemerintah.id/2023/06/kembangkan-literasi-sains-perpusnas-sediakan-beragam-konten-digital/>

<https://jakarta.suaramerdeka.com/nasional/1349208193/budaya-literasi-adalah-kunci>

<https://www.merdeka.com/peristiwa/kepala-perpusnas-tanpa-literasi-sdm-di-negara-kaya-sumber-alam-tak-akan-maju.html>

<https://mediautama.co/budaya-baca-sangat-penting-untuk-mendorong-pembangunan-perpusnas/>

<https://www.harianterbit.com/nasional/2749211986/upaya-mencerdaskan-kehidupan-bangsa-syarif-namdo-memiliki-daya-membaca>

<https://www.sonora.id/read/423817661/perpustakaan-nasional-mendukung-perpustakaan-sains>

The National Library of Indonesia is the center and the umbrella for the Provincial libraries of Indonesia. So, APIPI has an advantage of having collaboration and the support from the National Library, as they disseminate the information and the online Seminar to its Provincial library branches throughout the 38 provinces of Indonesia. So that the seminar can accommodate big capacity of online participants throughout the network access of the National Library.

With the hybrid platform organization, many advantages can be gained for the online access, as:

- Offer more flexibility, ease of access, and convenience of any chosen locations, although internet access and communication device is a prerequisite.
- Promote wider outreach about the information and theme, safe budget and time, no distance and time zone barriers for national and international speakers and attendance.
- Increase attendance with the level of flexibility, whether will be registered on-site or online.
- Overcome geographic limitations as allowing the possibility of speakers from other countries to contribute their expertise within several hours avoiding the business travelling and accommodation. However, the duration of seminar should be taken properly not too long.
- Provide easy access, especially for invited speakers which can interact from their own locations, although the time zone difference should be considered carefully and adjusted to the agenda of seminar.

However, it should also be considered the disadvantages of online seminar:

- For online speaker and attendees, the inter-action between the speakers and participants are limited, only during the Q&A session if it there is.
- Decrease in personal contact and less spontaneous.
- Must provide secure and safe access to avoid instability of connection and chance of hacking; must consider the quality equipment, connection speed, backup technologies, and multi-media and ICT technical experts.
- From the online speakers and attendees' sites, good internet connection at the receiving end is also the key in ensuring a smooth seminar.

On the other hand, the advantages of face-to-face seminar:

- The human inter-action between speakers and participants are more available and can be continued during the break or after the venue.
- The atmosphere of seminar can be detected and ensured, having check the reactions of participants.
- Promote more collaborative possibilities with real inter-action.
- More control of the session and less distraction occurs for attendees in various session circumstances (watch the presentations, no turn off cameras, come and go to the sessions, no answering mobile phones, etc.)

Synthesis

- Online Seminar or Hybrid can be valuable when they are offered and consumed under the right circumstances. They can be an excellent alternative to face-to-face seminar sessions, also considering the optimum and a very cost-effective solution for certain objectives. They are particularly effective for information that through relatively short presentations and not for themes that require long explanations or substantial discussion and groupwork.
- Face-to-face seminar sessions are appropriate and should be preferred whenever possible, for subjects that are less ‘straight forward’, require longer explanation and substantial exchange between the speakers and participants. It is much easier for the speakers to control the environment and keep participants engaged and motivated throughout the session.
- At the end of the day, nothing beats face-to-face interaction and communication between people. And this applies, at large, to delivering training sessions as well. However, there are cases when online seminar could be an optimum solution. These days, for many learning programs it may be the only viable and effective solution.
- Engagement with other international organizations besides IAP and AASSA, such as UNESCO, WOSL, PCST; then with the Ministry of ICT and the National Library, is beneficial to resonate the digitized science literacy louder and broader, as they are responsible in speeding up the development of digital literacy in general and science literacy in particular.

IX. BUDGETARY OF SEMINAR

(The budget is in USD)

Proposed of total budgetary seminar is : AASSA 19.400 + AIPI 21.120 = Total 40.520

The disbursements:

AASSA grant (without airfares)	: 10.815
AASSA grant for airfares	: 8.400 (note: direct transfer from AASSA to persons)
AIPI & local partners funding	: 21.120
TOTAL BUDGET	: 40.335

The AASSA grant for the webinar received excludes airfare tickets is USD 10.815.

The total AASSA grant includes airfare tickets for 14 persons, for a maximum USD 600 per person are 19.215.

The grant is paid for the access of online seminar, implementation, publication and dissemination.

The AIPI & local partners’ funding is 21.120.

The budget covers documentary, proceeding, circulation of invitations to stakeholders, secretariat, staff costs and miscellaneous.

The detail of the budgetary report is attached, with the details of receipts have already been sent to the AASSA Secretariat.

X. CLOSING OF REPORT

APII conveys the appreciation and thankfulness to AASSA and IAP, as well as the local partners: the Directorate General for Digital Literacy of the Ministry of Communication and Informatics, as well as the National Library of Indonesia, for the collaboration and continuous support to the opportunity of APII in hosting the important of International Seminar on Science Literacy in the Digital Era at Jakarta base, Indonesia.

The invited speakers and moderators from AASSA, APII, UNESCO, NASEM, fellows and stakeholders suggested by the Committees are reliable and proficient, make the presentations and discussion lively and enriched. The hybrid seminar gives the opportunity to invite speakers and participants from not only Jakarta – Indonesia, but also from abroad without difficulties, the only one is needed is the different time zone adjustment. This approach could be implemented as a whole virtual or hybrid in the future seminar / workshop / meeting with the precaution for smooth internet access and proficient ICT technical assistance for the smooth implementation process.

The Seminar is implemented in hybrid platform with less audience on-site, but the spirit and important issues as well as valuable discussion gained can be captured, enriched and represented in this report, Proceeding and Recommendations.

Thank you for the opportunity.

Jakarta, 2 October 2023

Reported by:
Finarya Legoh &
Rapporteur Team

APPENDIX 1. RECOMMENDATIONS

SCIENCE LITERACY IN THE DIGITAL ERA

Date and duration: Hybrid Seminar, 20-21 June 2023

Place: AIPI, at National Library Building, Jl. Medan Merdeka Selatan 11, Jakarta

Organizers: IAP, AASSA, AIPI

Participants/Speakers: Government bodies, international bodies, associations, researchers, educators, communities, etc.

Rationale

1. Science changes over time, you might have a set of data and analysis, but with time if we have new data, it changes the analysis. How can we ensure the general public, government, and everyone understand how science works? “The best available science at the moment” is to face uncertainty in the future, open access to science, make science accessible at all times.
2. We need to develop both science and science literacy for problem solving because they have become so needed today. There are two kinds of problem: a) the situational problem: WHAT problems? b) the behavioral problem: HOW (to-do) problems? Solving the latter constructively ought to be given the first priority over solving the former. Then it will enable humanity to survive with four “evers”: Ever intelligent, ever ideational, ever problem solving, and ever beyond AI.
3. A global governance framework must address the interoperability and interconnectivity that ensure data security and privacy. The creation of rules and regulations for data should also be one of the priorities.
4. Marginalized people need to be considered, because they are the most vulnerable – less access to almost everything, from healthcare to sanitation to the internet.
5. Science literacy enables students to engage meaningfully with contemporary issues, evaluate points of view, and make informed decisions. The curriculum encourages interest in scientific elements from early education process. The application of digital technologies in transforming science-based data into engaging educational tools which could improve interest in science and science literacy.
6. Three pillars of scientific literacy: governments, academics, and ordinary people. Due to the ineffective communication links between the three pillars, the intermittent connections were disrupted with hoax, anti-scientific, and conspiratorial information.
7. Most transformative digital solutions are not accessible because they are blocked by copyright and proprietary systems and are unevenly distributed in terms of language, content, and infrastructure. No global governance framework can ensure interoperability across systems and address data security and privacy concerns.
8. The importance of accuracy and transparency in reporting methods, data, and resources. Open access as something to uphold accuracy and transparency leads to conflicts of interest to such as privacy and data protection. There are ethical considerations related to privacy.
9. There is a disconnect between scientists and their public which is not new due to hierarchy vs network, as universities and state/ government research bodies are

bureaucratic, while public are ideally egalitarian, open, specifically so in democratic contexts.

10. Misinformation especially in social media is exceeded. What is proven to be successful decrease the misinformation is teaching people how to read and use data visualization—ensuring that they know how to read and understand scientific data, so that people know the type of influence that is taking place. Currently, we can collect the existing practices and look for the most effective means to promote science literacy.
11. When using science literacy, we must ensure ethical and responsible Artificial Intelligence (AI), as there have been various use cases of AI. Ethics issues can pose business risks such as product failures, legal issues, etc. There should be a framework to ensure the ethical use of AI and sustain the trust of employees and customers, with privacy and data security concerns. However, AI has enormous potential to be developed as it can transform various livelihood sectors.

Recommendations

1. Generate a framework/ guide to assess specific potentially misleading claims, and counterclaim them with science. The framework is essential because, during counterclaiming, it might also amplify the misinformation.
2. Bridge the digital divide, various stakeholders including the government, must take their part by creating sufficient policies that facilitate the transition for the older generation to the digital era: for internet companies – develop interfaces that are inclusive for older people; media – promote and report the importance of older generations in using their digital skills; community – organize learning and training activities that friendly to older people.
3. Popularize science in various platforms and media channels, which the outline ensured the availability of digital resources, which are made available for lifelong learning related to the digital age and how society can adapt.
4. Prepare for new threats arising from the widespread implementation of Artificial Intelligence (AI) and the hegemony of superpower nations in controlling global economic resources and markets.
5. Develop strategy to increase the interest of young generation in science literacy, e.g.: publish popular materials related to science and making them accessible to kids (started with blog and books, then it became audiobooks, visual books).
6. Activate scientists in promoting science to society, especially to the youth, by using various media available on the Internet (and others). Encourage and support scientists and science graduates who are potential to become science communicators.
7. Implement a public-driven science communication to improve inclusivity and reach out to a larger audience, as science communication implies that there should be better engagement and it has to stipulate a sense of curiosity-interesting based upon the audience. There has to be a specific framework for content creators when using science communication.

8. Include six common topics in all digital literacy curriculum with: 1) Information literacy; 2) Ethical use of digital resources; 3) Understanding digital footprints; 4) Protecting yourself online; 5) Handling digital communication; 6) Cyberbullying.
9. Assist facilitators Online Synthesis System in reaching out to communities by providing the opportunity to connect general society with scientific communities, which would allow novel generation of knowledge.
10. Establish methods and tools to examine and distinguish inaccuracy in scientific claims, because it affects how individuals -both in the science community and elsewhere- form their perceptions of risks, thereby, their decision-making.
11. Use and take the digital literacy technology to the rural and marginalized communities everywhere. Digital literacy would be helpful since they cannot come to the classroom. Maybe the digital way could be used to educate them as well.
12. Encourage scientific literacy in netizens, scientific content must be packaged in an easily consumed and digestible format, i.e. using storytelling in presenting scientific content could make its consumption more accessible and more appetizing – to bridge scientific community and society at large essentially, to making science more accessible to public.
13. Unlock the knowledge of researchers and academics to provide public with clarity and insight into society; and overcome digital divides, structural public problems and inequalities with science communication as a strategy, such as: digital literacies to structural problems, using social media with the help of professional (vloggers, podcasts, graphic animators, etc.).
14. Advantage digital media for communication: low cost or no cost, offers two-way communication, encourages public participation, use of regional language, etc.
15. Need to know how to choose the proper information, need to find a connection between science education where we cultivate the scientific mindset and science communication where we make the information relevant to people. Although science literacy is global, but we need to customize and to consider the local needs and local advantage according to a special condition of society or a nation.

Finalized Recommendations

1. Transfer of technology digitally is not only making our live easier, but also more complicated, full of uncertainty and complexity. So, we need science communications to reduce the risk of the threats.
2. Encourage various development of science literacy in the digital era, and what should always bear in mind is ethics, which is placed as the most important one.
3. Global initiative should be taken to expand the horizon and to accommodate collaboration among global researchers.
4. The research projects in member countries on science and literacy - we need a force of collaboration programs between members and workload networking for collaboration in the future.
5. More online programs should be organized because it is not easy to meet together offline.

APPENDIX 2. PROMOTION AND FLYERS OF SEMINAR

AASSA International Seminar on SHARE
(Science, Health, Agriculture, Risk & Environment)
Communication Hybrid Seminar

Keynote Speakers:



The flyer features a central graphic with a network of nodes and arrows. Six circular portraits of keynote speakers are arranged around this graphic. A red starburst graphic on the right says 'BOOK LAUNCHING' and a yellow starburst at the bottom right says 'FREE E-Certificate'. Logos for AASSA, IAP, and AAPI are at the bottom.

Mr. Muhammad Syarif Bando, MM
Head of National Library of Republic of Indonesia

Mr. Semuel Abrijani Pangerapan, MM
Director General for Application of Informatics KOMINFO

Prof. Dr. Nizam
Director General for Higher Education, Research & Technology, DIKBUDRISTEK

Dr. Kavita M. Berger
Director for the Board on Life Sciences at NASEM USA

Prof. Xiang-ping Wu
World Organization for Science Literacy (WOSL)

Ms. Marielza Oliveira, PhD.
Director for Partnerships and Operational Programme Monitoring Communications & Information Sector UNESCO

Prof. Hak-Soo Kim
Life member of PCST Network

SCIENCE LITERACY IN THE DIGITAL ERA
20-21 June 2023
National Library Building
Jl. Medan Merdeka Selatan 11, Jakarta

ZOOM: s.id/ScienceLiteracy2023
YOUTUBE: Perpustakaan Nasional RI

Hybrid Seminar Day 1

SCIENCE LITERACY IN THE DIGITAL ERA
20 June 2023
Auditorium of National Library Building
Jl. Medan Merdeka Selatan 11, Jakarta

Welcome & Congratulatory Remarks

- Dr. Finarya Legoh, Chair of SHARE Communication of AASSA
- Dr. Boni Pujianto, Director of Digital Literacy of Ministry of Communication & Informatics (KOMINFO)
- Prof. Dr. Satryo Soemantri Brodjonegoro, President of the Indonesian Academy of Sciences (IAPI)
- Prof. Dr. Ahmet Nuri Yurdusev, President of the Association of Academies and Societies of Sciences in Asia (AASSA)

Keynote Speakers

- Dr. Kavita M. Berger, Director, Board on Life Sciences, Division of Earth and Life Studies, National Academy of Science Engineering and Medicine (NASEM), USA
- Prof. Dr. Wu Xiang Ping, World Organization for Science Literacy (WOSL); Chinese Academy of Sciences
- Mr. Semuel Abrijani Pangerapan, MM; Director General for Application of Informatics, Ministry of Communication & Informatics
- Mr. Muhammad Syarif Bando, MM; Head of National Library of Republic of Indonesia

Session 1

- Dr. Hammam Rita; Centre of AI and Cybersecurity, National Research & Innovation Agency (BRIN); Chair of AI Committee of Centre for Technology and Innovation Studies (CTIS)
- Prof. Dr. Zabta Khan Shiwari; Pakistan Academy of Sciences; Vice President, Islamic World Academy of Sciences; Qaid-i-Azam University, Islamabad-Pakistan
- Dr. Ganigar Chen; Vice President of National Science Museum, Pathum Thani, Thailand
- Prof. Hendra Gunawan; Fellow of IAPI for Basic Science Commission
- Prof. Dr. Mehmet Emin Aydin; Turkey Academy of Sciences (TUBA); Necmettin Erbakan Universitesi, Konya – Turkey

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Keynote Speaker 2

- Ms. Marielza Oliveira, PhD.; Director for Partnerships and Operational Programme Monitoring Communications and Information Sector; the United Nations Educational, Scientific and Cultural Organization (UNESCO)

Session 2

- Prof. Narinder Mehra; Vice Chair of Indian National Science Academy (INSA); expert in Transplant Immunology and Clinical Immunogenetics
- Prof. Budi Wicoko; Digital Literacy in Health; Fellow of IAPI for Medicine Science Commission; Faculty of Medicine, University of Indonesia (online)
- Prof. Dr. KOIKE Toshio; Integration of knowledge and capacity towards building sustainable and resilient society by all; Executive Director, International Centre for Water Hazard and Risk Management (ICHARM), Public Works Research Institute (PWRI), Tsukuba, Japan

Session 3

- Dr. Aristotle Carandang; Director, Institute of Indigenous Science, Technology, Arts & Society; Philippine Women's College of Davao, Davao City, Philippines
- Dr. Johannes Haryatmoko; Fellow of IAPI for Culture Commission
- Prof. Abhi Veerakumarasivem; Provost, Sunway University of Malaysia, INGA-Asia
- Dr. Nguyen Tuong Lan; Manager of S&T Development of Forecasting Department, Institute for Scientific Information, Vietnam Academy of Science
- Melanie Hughes, Curriculum Specialist, Technologies ACARA & Simon Collier, Curriculum Specialist, Science ACARA; Australian Curriculum Assessment and Reporting Agency (ACARA)

Session 4

- Prof. Pavel Krestov; Director of Botanical Garden Institute, Vladivostok – Russia; Fellow of Far Eastern Branch of the Russian Academy of Sciences
- Prof. Dr. Anjana Singh; Academician, Nepal Academy of Science & Technology (NAST); Central Department of Microbiology, Tribhuvan University, Kirtipur, Kathmandu, Nepal
- Prof. Suhono Harso Supangkat (Institute Technology of Bandung)
- Mr. Firdza; Pandemic Talk, UNICEF Indonesia
- Dr. Zulfa Zhakiyya; fellow of Indonesian Academy of Young Scientists (ALMI); Universitas Negeri Semarang
- Prof. Isa Habibbayli, President of Azerbaijan National Academy of Sciences

Summing Up Day 1

- Prof. Dr. Manoj Kumar Patariya; President International Science Writers Association, New Delhi, India; Former Chair of SHARE Communication
- Ms. Dyah R. Permatasari; CEO DoctorRabbit Science

Hybrid Seminar Day 2

SCIENCE LITERACY IN THE DIGITAL ERA
21 June 2023
Auditorium at National Library Building
Jl. Medan Merdeka Selatan 11, Jakarta

Keynote Speakers

- Prof. Hak-Soo Kim; Life Member, Public Communication on Science & Technology (PCST); Former Chair and Founder of AASSA Special Committee on SHARE Communication
- Prof. Dr. Nizam, Director General Higher Education, Research & Technology; Ministry of Education, Culture, Research & Technology of Indonesia

SHARE Communication

- Dr. Finarya Legoh; Chair of SHARE Communication; Introducing AASSA Special Committee on SHARE Communication
- Prof. Manoj Patariya; President International Science Writers Association, New Delhi, India; Former Chair of SHARE Communication
- Dr. Inaya Rakhmani; University of Indonesia / Advisory Committee of Indonesian Academy of Young Scientists
- Mr. Ahmad Nuhasim; Science and Health Editor; The Conversation Indonesia
- Ms. Dyah R. Permatasari; CEO DoctorRabbit Science

Panel Discussion Community on Digital Literacy

- Moderator: Dr. Harjanto Halim; Chair of National Education Foundation of Karangturi, Semarang (tbc)
- Dr. Ardi Saleh; Chief Indonesia Cyber Security Forum
- Dr. Ganigar Chen; Vice President of National Science Museum, Pathum Thani, Thailand
- Prof. Abhi Veerakumarasivem; Provost, Sunway University of Malaysia, INGA-Asia
- Prof. Dr. Agus Haryono, Deputy of Research & Innovation Facility, National Research and Innovation Agency (BRIN)

Summing Up and Recommendation

- Prof. Hak-Soo Kim; Life Member, Public Communication on Science & Technology (PCST); Former Chair & Founder of AASSA Committee on SHARE Communication
- Dr. Aristotle Carandang; Philippine Women's College of Davao, Davao City, Philippines

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APPENDIX 3. EXAMPLE OF CERTIFICATES OF SEMINAR



APPENDIX 4. BANNERS AND NAME TAGS

PERPUSTAKAAN NASIONAL
REPUBLIC OF INDONESIA

KEMKOMINFO

APII
THE ASSOCIATION OF INSTITUTE OF POLICY AND INFORMATION INSTITUTE

iap
SCIENCE HEALTH POLICY
the intercommunity partnership

aassa
THE ASSOCIATION OF ACADEMIES AND SOCIETIES OF SCIENCES IN Asia

WELCOME TO PARTICIPANTS
AASSA International on SHARE
(Science, Health, Agriculture, Risk & Environment)
Communication

SCIENCE LITERACY IN THE DIGITAL ERA
Hybrid seminar
20-21 June 2023
National Library Building
Jl. Medan Merdeka Selatan 11, Jakarta

Zoom: s.id/ScienceLiteracy2023 | Youtube: Perustakaan Nasional | **FREE Certificate**

MEMANGUN BANGSA CERDAS
BOOK LAUNCHING

PERPUSTAKAAN NASIONAL
REPUBLIC OF INDONESIA

KEMKOMINFO

APII
THE ASSOCIATION OF INSTITUTE OF POLICY AND INFORMATION INSTITUTE

iap
SCIENCE HEALTH POLICY
the intercommunity partnership

aassa
THE ASSOCIATION OF ACADEMIES AND SOCIETIES OF SCIENCES IN Asia

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SCIENCE LITERACY IN THE DIGITAL ERA

AASSA International
Seminar on SHARE
(Science, Health, Agriculture, Risk & Environment)
Communication
20-21 June 2023

Narinder K Mehra
SPEAKER

SCIENCE LITERACY
IN THE DIGITAL ERA

Hybrid seminar
20-21 June 2023
National Library Building
Jl. Medan Merdeka Selatan 11 Jakarta

AASSA International
Seminar on SHARE
(Science, Health, Agriculture, Risk & Environment)
Communication
20-21 June 2023

Kim Han Seul
PARTICIPANT

MEMANGUN BANGSA CERDAS
BOOK LAUNCHING

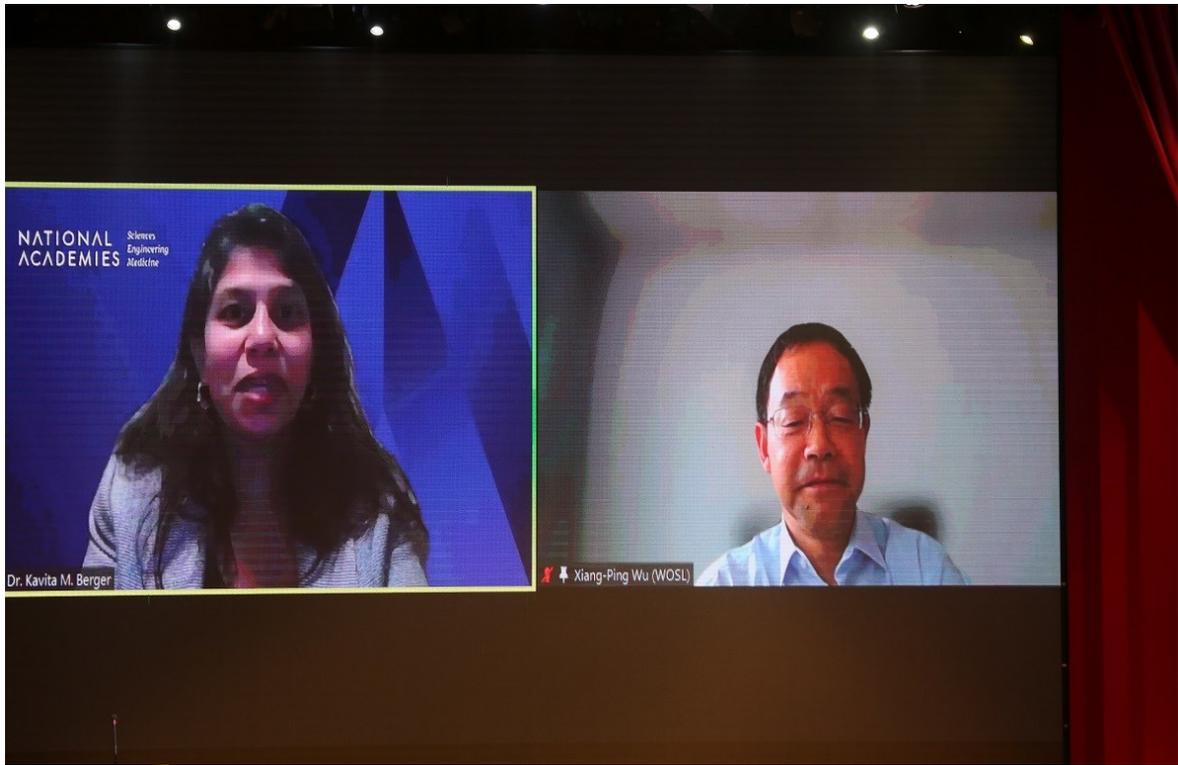
SCIENCE LITERACY
IN THE DIGITAL ERA

ZOOM: s.id/ScienceLiteracy2023
YOUTUBE: Perustakaan Nasional



APPENDIX 5. PHOTOS







APPENDIX 6. LINKS TO PRESENTATION MATERIALS AND OTHERS

Presentations:

<https://bit.ly/materiliteracy23>

Photos:

https://bit.ly/Foto_AASSA_20-21_June_2023

Certificates of appreciations:

https://bit.ly/aassa_sertifikat_moderator_pembicara