NATIONAL INSTITUTE OF SCIENCE AND TECHNOLOGY POLICY

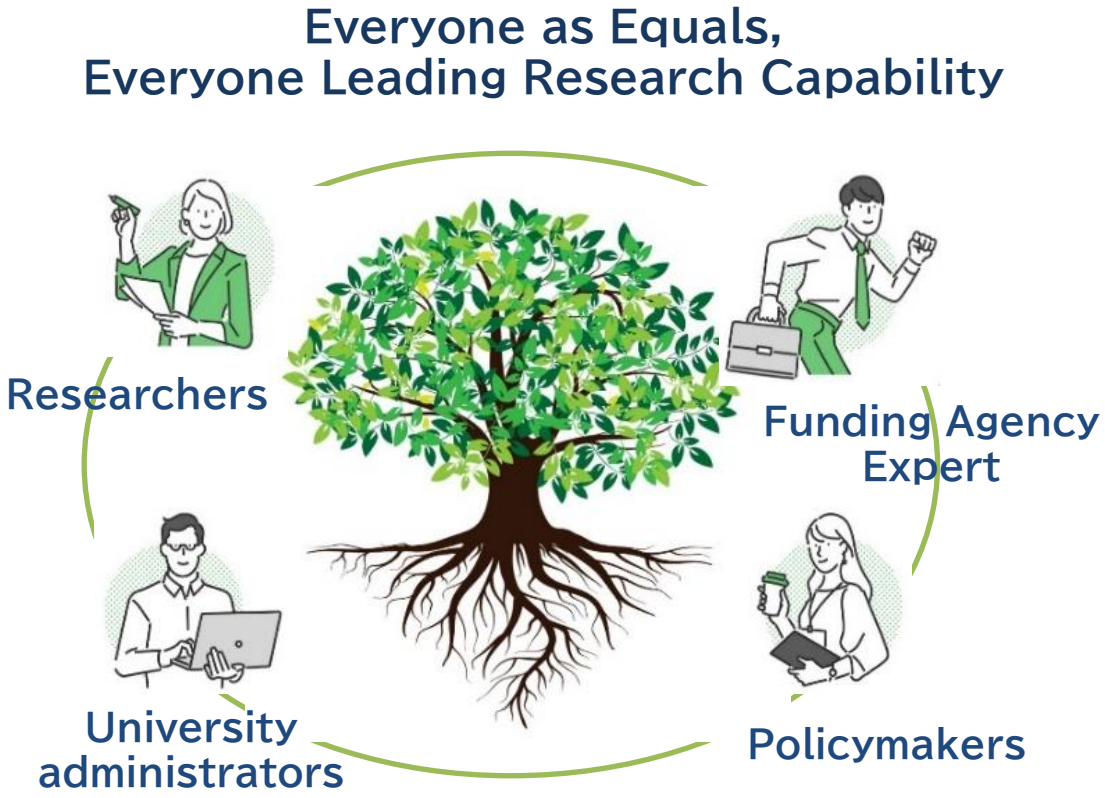
Results of Dialogue at the NISTEP Co-creation Workshop
(Provisional Translation)

December 20, 2024

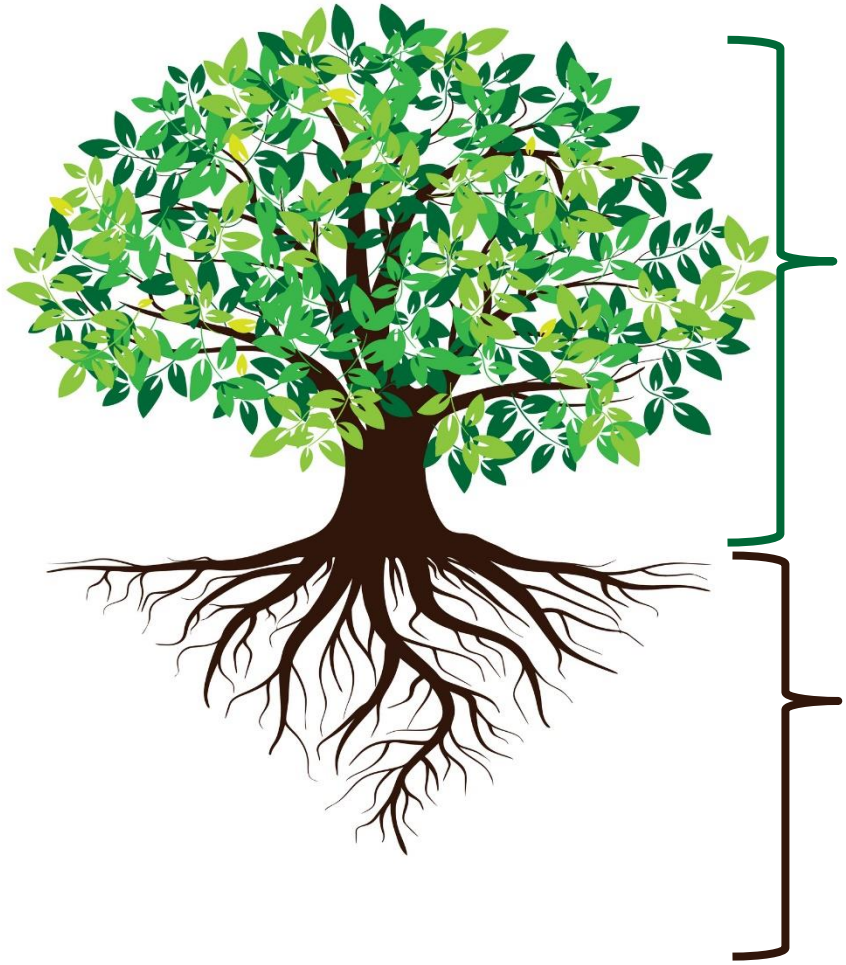
National Institute of Science and Technology Policy, MEXT
SAKAI Tomoko

Overview of NISTEP Co-Creation Workshop

- Date: Friday, November 22, 2024, 1:00 p.m. - 4:00 p.m.
- Format: Online
- Participants: 12 researchers, URA, funding agency experts, and policy makers (3 groups of 4)
- Contents: Conducted a dialogue on rethinking research capabilities and efforts to fostering a “foundation for maturing research capabilities” in collaboration with diverse actors.



Foundation for maturing research capabilities



Research Capability

- **Capability for creating new knowledge**
  - Human resources
  - Physical resources and infrastructure
  - Knowledge and Technology Accumulation
  - Outcome Creation and Application, etc.

Foundation(environment and culture) for Maturing Research Capability

- A foundation that supports research capabilities and allows each actor to take on challenges with confidence
  - Plurality and inclusiveness
  - Freedom and autonomy
  - Openness and credibility
  - Mutual benefit and collaboration
  - Sustainability and stability

In recent years, there has been an international movement for behavioral change in research.

Reconsidering research evaluation metrics - developing Responsible Research Assessment (RRA), Promoting open science, etc.

Dec. 2012

DORA

https://sfdora.org

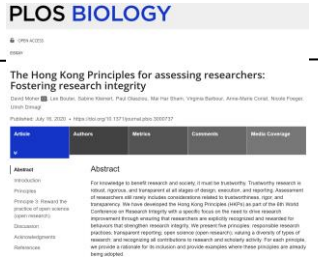
May 2013

Leiden Manifesto

Sept. 2018

Plan S

July 2020

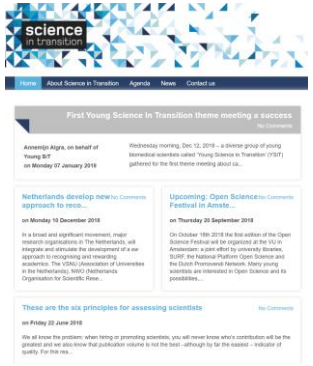


Hong Kong Principles

Nov. 2021

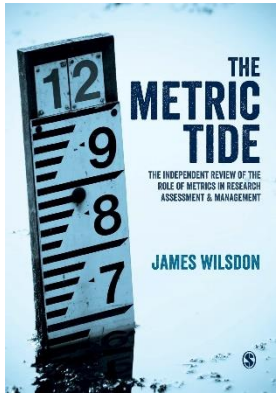
EC Scoping Report

May 2013



Science in Transition

May 2015



Nov. 2019

Room for everyone 's talent Netherlands initiative

Nov. 2020

GRC meeting

Nov. 2021

UNESCO Recommendations

This international movement has been gathering pace.

Jan. 2021

Strategy Evaluation Protocol (SEP) 2021–2027

Dec. 2022

CoARA
Coalition for Advancing Research Assessment

CoARA

Sept. 2023

Research Excellence Framework (REF) 2028

Apr. 2024

Barcelona Declaration

Sept. 2024

EC Scoping Report

Jan. 2022

OpenAlex

OPEN ALEX

Points of the international movement for behavioral change in research

(1)Keywords

- Plurality, Inclusiveness
- Freedom, Autonomy
- Openness, Credibility
- Mutual Benefit, Collaboration
- Sustainability

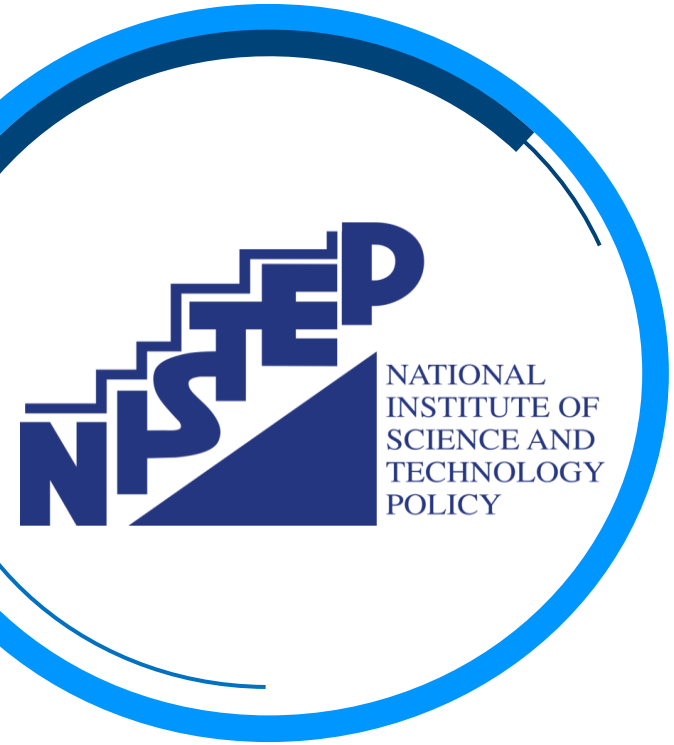
(2)How to be

- Dialogue

(3)Action

- Environmental and cultural change

Proposed components of foundation for maturing research capabilities



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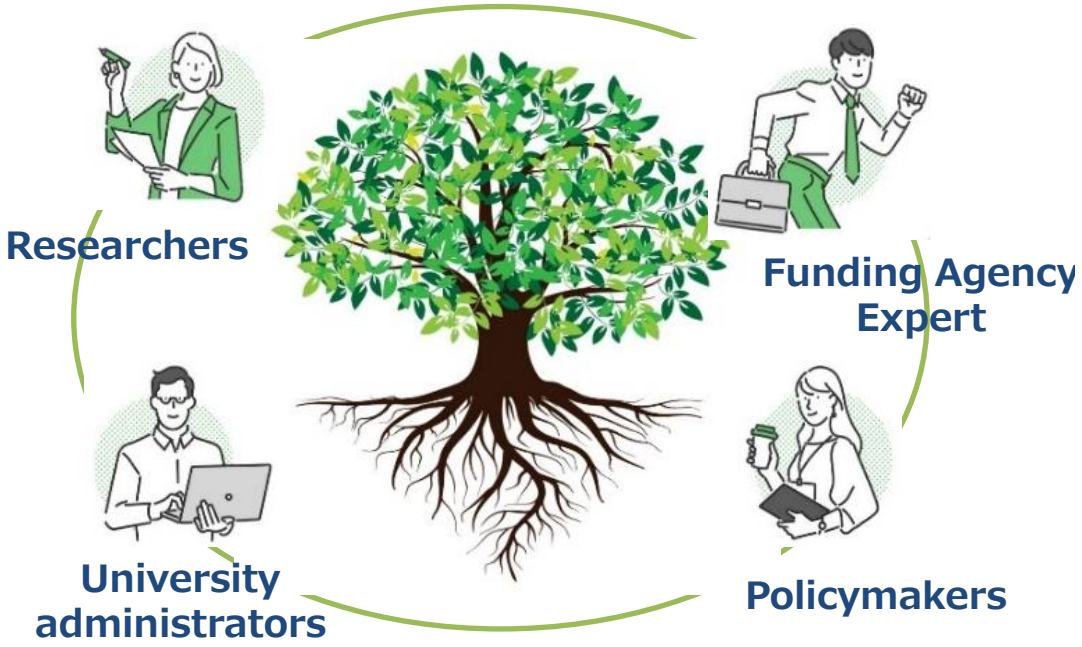


- Participants come from diverse fields as mathematics, engineering, molecular biology, embryology, and museum studies.
- More than half of the participants were women.
- Foreign researchers working as Principal Investigators (PIs) in Japanese organizations also participated.
- Young and mid-career researchers and professionals at the forefront.

How to facilitate group dialogue

[Contents of dialogue]

Dialogue 1: Exploring new perspectives on “Foundation for Maturing Research Capability”

(1) What is your idea of “Research Capability (driving force, philosophy of action)”?

(2) What is your idea of the “Foundation for Maturing Research Capability”?

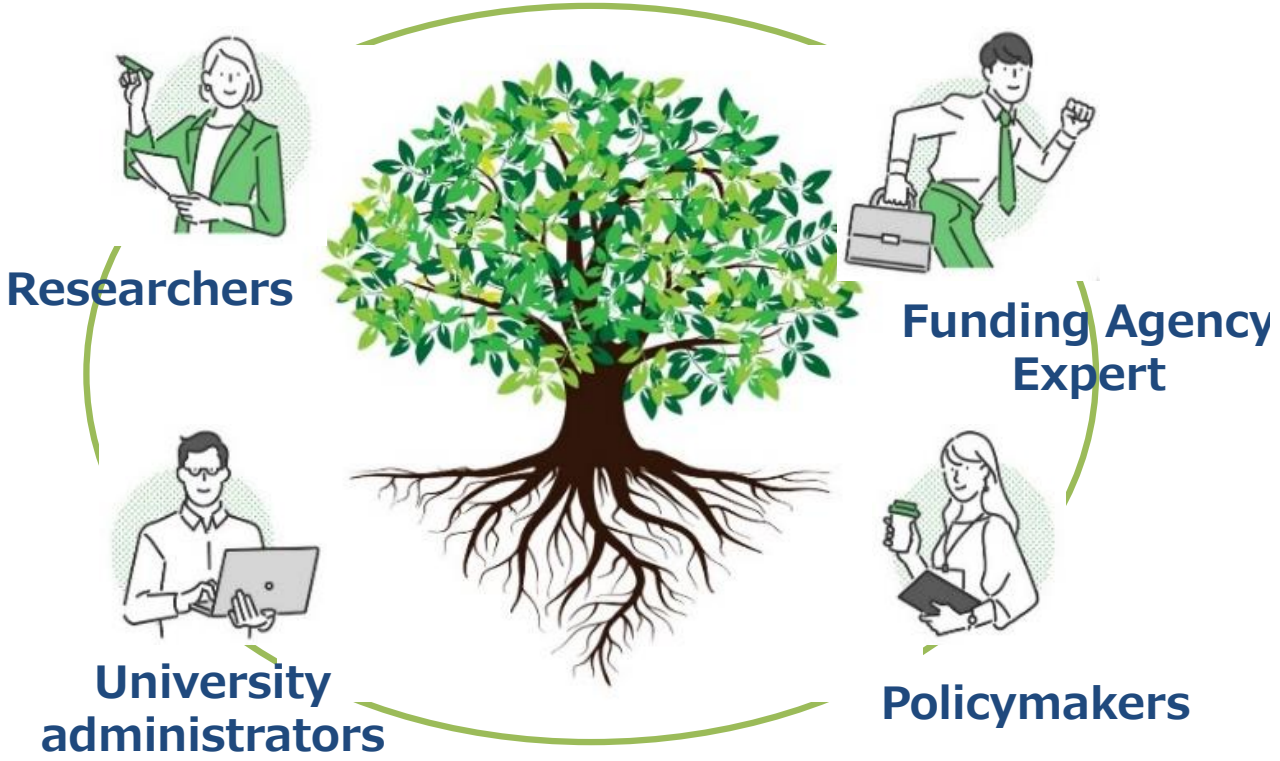
Dialogue 2: Efforts required to foster the “Foundation for Maturing Research Capability” in the next 20 years

(3) What can we do for each other in fostering the “Foundation for Maturing Research Capability”?

The new perspectives, new insights, and new values that emerged in this dialogue were all an important part of the dialogue process.

Everyone as Equals, Everyone Leading Research Capability

- We had different positions and roles, but we were united by a common wish to contribute to science and technology.
- By bringing together a diverse range of actors, including researchers, experts in the management of universities and research institutions, funding agency experts, and policy makers, we have been able to mature the foundations of research and create new value.



Research Capability

Elements of “Research capability” derived from dialogue

Driving force/philosophy of action

Creativity and knowledge systematization: the ability to create new value

- **Unrestricted creativity**

The creative power to generate new ideas and concepts and the systematization of knowledge to support them are essential for all research-related activities. This ability is necessary for all stages and actors from theoretical and basic research to social implementation.

Intellectual curiosity and persistence: the ability behind the creation of new value

- **Intellectual curiosity**

The foundation of research capability lies in “intellectual curiosity” about unknown phenomena and issues. This curiosity is the driving force that propels research activities.

- **Sustained ability to pursue intellectual curiosity**

“Persistence” and “tenacity” to endure long-term trial and error and pursue intellectual curiosity are essential.

The ability to grasp the essence: a foundation that facilitates the creation of new value

- **Ability to deeply observe phenomena and capture their essence**

The ability to deeply observe natural phenomena and issues and **to grasp the essence** behind them is the key to generating new knowledge.

- **Ability to open up uncharted territory**

Keen powers of observation, the ability to discern the essence of issues, and the mental strength to confront difficulties and lead the way to solutions are essential.

Elements of “Research capability” derived from dialogue

Propulsion / Approach

Ability to expand the value of research

- **Ability to share the significance of research with society**

The key to expanding the value of research is to share the results and significance of research with **society as a whole**, and to gain its understanding and support.

- **Collaboration with diverse fields, professions, and industries**

By collaborating across different fields, specialties, and , we can take on **complex problems that cannot be solved alone** and produce innovative results.

- **Fostering a rich research culture**

Forming an **atmosphere and culture in which colleagues enjoy and enhance each other’s research** is an important factor in improving the quality and value of research.

- **Collaborative bridging between sectors**

Collaboration will be enhanced by individuals who can connect different sectors and discuss a common research vision, **acting as bridges** across disciplines.

Power of collaboration: connecting the baton to maximize research results

- **Role of experts at each stage**

Each phase has its own professional roles for researchers, technicians, URA/FA professionals, and policy makers.

- **Importance of collaboration in connecting the baton**

When each specialist **collaborates with each other** and connects the baton, the flow of research becomes smoother and results **are maximized**.

“Value of research” and “Research capability” derived from dialogue

The value that is expressed

Novelty and creativity: the ability to open up unexplored areas

- **Creation of new value**

The ability to pursue new discoveries and ideas and **create value that transcends time and field** is required.
A humble attitude that flexibly incorporates knowledge, values, and methodologies from other fields will further expand creativity and open up new possibilities.

Social implementation capability: ability to apply research results to society

- **Application and contribution to the real world**

The ability to apply research results to **industry, medicine, education, and other** fields and to contribute to **solving specific social challenges** is required.

- **Collaboration between researchers and diverse collaborators**

This power is maximized **not only through the efforts of the researchers, but also through collaboration with relevant actors.**

Ability to disseminate research results

- **Ability to disseminate research results**

The ability to communicate research results to **society and different fields in** an easy-to-understand manner to gain support and utilization.

Examples: Exhibitions at museums and science museums, information dissemination through the media.

“Value of research” and “Research capability” derived from dialogue

Unexpressed and unnoticed value

Valorization of all processes, including failures

- **Failure is the seed of discoveries**

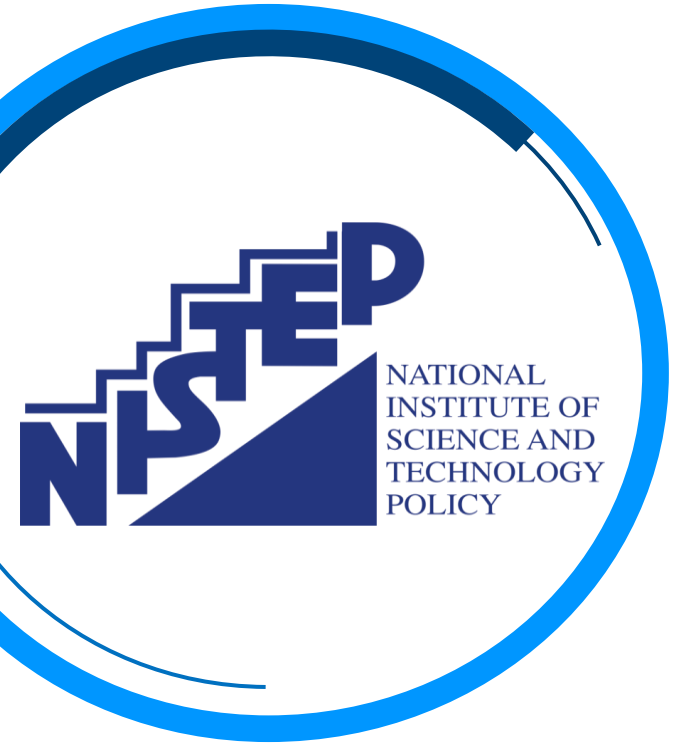
Failure in research is not merely the end of the process but can **feed discoveries and methodologies.**

- **A culture that does not overlook potential value**

A culture that respects potential values and abilities, rather than judging them solely on their current value, is necessary. Processes that, at first glance, may be considered “failures” can become **valuable information and assets** for the next generation to take on challenges.

- **Differences between AI and humans about “failure”**

Unlike humans, AI does not have information on “failure” and cannot experience failure itself. However, incorporating “failure” data into AI could **lead to new intellectual values and creative** approaches.



Foundation for maturing research capabilities

“Foundation for maturing research capabilities” derived from dialogue <Environment>

Ensuring Flexible Environments

- **Securing time and space to concentrate**

It is necessary to create an environment in which **time, space, and resources** are available so that people can concentrate on research-related activities.

- **Flexible system that is not affected by life stages or workload**

A system that allows for flexible activities without being influenced by life stages or workload (e.g., report preparation) is needed.

Ensure human resource mobility

- **Ensuring freedom of movement**

The **free movement of** human resources allows them to respond flexibly to their own career development and life events.

- **Assistance in making appropriate career choices**

An environment and culture in which **appropriate career** choices are made according to life stages and circumstances is required.

Maintenance of facilities and equipment

- **Challenges for research facilities at local universities**

A lack of **research facilities and common equipment** is a challenge for local universities.

- **Need for a well-developed environment**

To improve the quality of research activities, facilities, and equipment must be **enhanced and shared.**

“Foundation for maturing research capabilities” derived from dialogue <Environment>

Enhancement of specialized departments and the skills and value of the administrative force

- **Establishment of specialized departments and mechanisms**

Establish a mechanism to reduce the burden on researchers by **establishing a department dedicated to** patent and intellectual property management, public relations activities, and fundraising.

- **Improving the skills and value of the profession**

URA professionals and FA professionals will enhance their professional knowledge and management skills to support the improvement of the skills and value of the administrative force throughout the organization.

Building a research environment that overcomes language barriers

- **The challenges and importance of language barriers**

Language barriers can be a major obstacle for foreign researchers and international students when conducting **research activities** in Japan. It is necessary to create an environment that resolves this and allows for the incorporation of **diverse opinions and knowledge**. No one wants to work in a place where their voice is not heard.

- **Specific measures for building an environment**

Promoting the use of English at key meetings such as faculty meetings
Introducing **a multilingual translation function using generative AI**

“Foundation for maturing research capabilities” derived from dialogue <Funding>

Introducing a variety of funding sources

- **Diversifying funding sources**

In addition to government support, it is also important to use a variety of funding sources to make up for any shortfall in basic expenses.

Examples: Developing a system for accepting **donations**
Utilizing **crowdfunding** and **corporate sponsorship**
Obtaining funding through **joint research agreements** and **social partnership programs**

Securing stable funds and positions

- **Stable funding as the basis for research continuity**

To ensure the **continuity and development** of research, it is essential to provide stable funding **over the long term.**

- **Support for flexible management and ideas**

By enabling flexible management of research funds, an environment is created that supports **free theme selection, the realization of sudden discoveries and new ideas,** and promotes creative research.

“Foundation for maturing research capabilities” derived from dialogue <Support for students, young and mid-career professionals>

Career development support

- **Introduction of a mentoring system and career counseling**

In each sector, a mentoring system and career counseling should be introduced to help students, young and mid-career professionals, develop **clear career paths** and develop appropriate support system.

- **Providing a variety of career options**

Provide various **options for** young researchers to expand their possibilities, not only in academia but also in **career paths outside academia.**

A system to train young and mid-career throughout the organization

- **Building a mutual support system and network**

Establish a system to support young and mid-career workers throughout the organization and **promote their growth** by creating community networks.

- **Building an environment and culture that encourages proactive initiatives**

Develop an environment and culture where young and mid-career workers can have their discretion and work **independently and proactively.**

“Foundation for maturing research capabilities” derived from dialogue <Support for students, young and mid-career professionals>

Providing experiences related to research to the next generation

- **Importance of early experience**

Providing opportunities for students to **gain early exposure and experience in research-related activities** connects to enhancing their future **research skills.**

There is concern that the rise of AI will diminish human ”thinking skills,” so it is important to foster thinking skills through research experiences.

- **Presenting an attractive career picture**

The next generation must be presented with an **attractive career** vision so that they can look to the future.

“Foundation for maturing research capabilities” derived from dialogue <Activities as a team>

Team-supportive research environment and culture: role-sharing and human resource development

- **Importance of a team structure based on the division of roles**

It is important to have a system in which researchers, URA professionals, technical and administrative staff **share roles** and **work as a team to promote research.**

- **Development of professional human resources and establishment of career paths**

Long-term **research management systems** must be **strengthened through support for skill development and the establishment of career paths for specialized personnel** such as URAs and technical staff.

- **Creating a dependable research community**

Surrounded by **dependable colleagues**, including veterans, young researchers, and students, this environment is essential for the advancement of research and the development of human resources.

A supportive culture and community are the foundation for sustainable research capacity. Both ”helping” and ”being helped” are important.

“Foundation for maturing research capabilities” derived from dialogue <Research evaluation>

Breaking away from short-term results-oriented approach

- **Need for multifaceted research evaluation**

Rather than focusing solely on the number of papers or funding obtained, **a multifaceted evaluation** that includes the **research process** and **experience of failure** is required.

- **Promoting transparency and cooperation**

A mechanism is needed to ensure research transparency and to promote **cooperation** with other fields **through data sharing.**

Need for long-term perspective

- **The need for a long-term perspective in research evaluation**

The value of research cannot be measured solely by **short-term results**, and **changes in values** can affect research evaluation. Therefore, it is important to take a **long-term vision** into account.

- **New value through the combination of failure and AI**

Processes and information that are currently considered to be **failures** may be re-evaluated through the combination of **generative AI,** and there is the possibility that **new value** that has not been discovered until now will be discovered.

“Foundation for maturing research capabilities” derived from dialogue <Research evaluation>

Cross-disciplinary collaboration and the restructuring of evaluation systems

- **The importance of cross-disciplinary collaboration**

New solutions to complex problems can be found through collaboration between researchers from different fields and with different specialisms. Cross-disciplinary collaboration requires **time and effort**, but the benefits are immeasurable.

- **Rebuilding the evaluation system**

Under the current evaluation system, it is difficult to properly evaluate the results and processes of cross-disciplinary collaboration. We need to rebuild the evaluation system to incorporate a **long-term perspective, emphasize the process**, and create an environment and culture that promotes cross-disciplinary collaboration.

The harmful effects of “over-measuring” and the need to restructure evaluation systems

- **Adapting to excessive evaluation criteria**

Universities and researchers are being **forced to adapt to overly quantitative evaluation criteria**, making it harder to see the true value of research.

- **Appropriate evaluation of the research process and diverse results**

There is a need for a system that appropriately evaluates the **research process and diverse results**.

Example: Evaluate the **process** as well as the results

Introduce flexible evaluation criteria that respect **diversity and pluralism**

“Foundation for maturing research capabilities” derived from dialogue <Cooperation with society>

Communicate the appeal of research to society and expand the circle of support and assistance

- **Disseminate to society the enthusiasm and content of research-related activities**

By communicating the **enthusiasm of those involved in research and the content of research** to society in an easy-to-understand manner, a wide range of **understanding, support, and assistance** can be obtained. Through dialogue with society, the value of research is shared.

- **New roles for museums and science museums**

Museums and science museums have traditionally played an important role as places for social education. Beyond that, however, they are expected to play a new role in deepening interest in and understanding of research by functioning as places where citizens and children can interact with researchers.

“Foundation for maturing research capabilities” derived from dialogue <Trust building>

Building a trusted research society: the importance of respect and dialogue

● Restoring trust and respect for researchers

In recent years, **excessive paperwork and procedures** aimed at preventing research misconduct have increased. As a result, there is concern that this may be perceived as a message to researchers that they are not trusted, thereby undermining the essence of research. Building a **trusted and respected** society is essential for the future of science and research.

● Providing a forum for open and fair dialogue

It is crucialto create a forum for researchers, URA professionals, FA professionals, policymakers, and the public to interact, **listen to each other, and collaborate on** an **equal basis**, thereby fostering mutual understanding. This will help maintain public trust and support for research-related activities.

“Foundation for maturing research capabilities” derived from dialogue <Improvement in culture>

The power of research created by the voiceless: an important force for nurturing the future

- **Power of the “voiceless voices” behind science**

The history of science is not made up only of famous people and major discoveries. **Many people whose names are not mentioned have worked together in unseen places to support science.** We must be aware that these **“voiceless voices”** (**unnoticed thoughts and efforts**) are critical important and serve as a force to nurture future science and research.

- **Importance of revealing the ‘unnoticed voice’ through deep listening**

It is essential to listen to the **true feelings and “voiceless voices” that the person speaking is unaware of** through deep listening. By revealing these voices, the research-related challenges currently faced may be gradually resolved. Listening to, **verbalizing and clarifying** the thoughts and ideas of all people is an important ‘soil’ for nurturing the future.

“Foundation for maturing research capabilities” derived from dialogue <Personal Opinion>

Research capabilities utilizing human virtues: a future pioneered through dialogue and co-creation

- **“Uniquely Human Abilities” required for research activities**

In all research-related activities, **empathy, thought, analysis, imagination, and creativity are irreplaceable human capacities. These abilities are maximized when we value our own and others’ values and states of mind.**

- **Acknowledgement of different values and a willingness to cooperate**

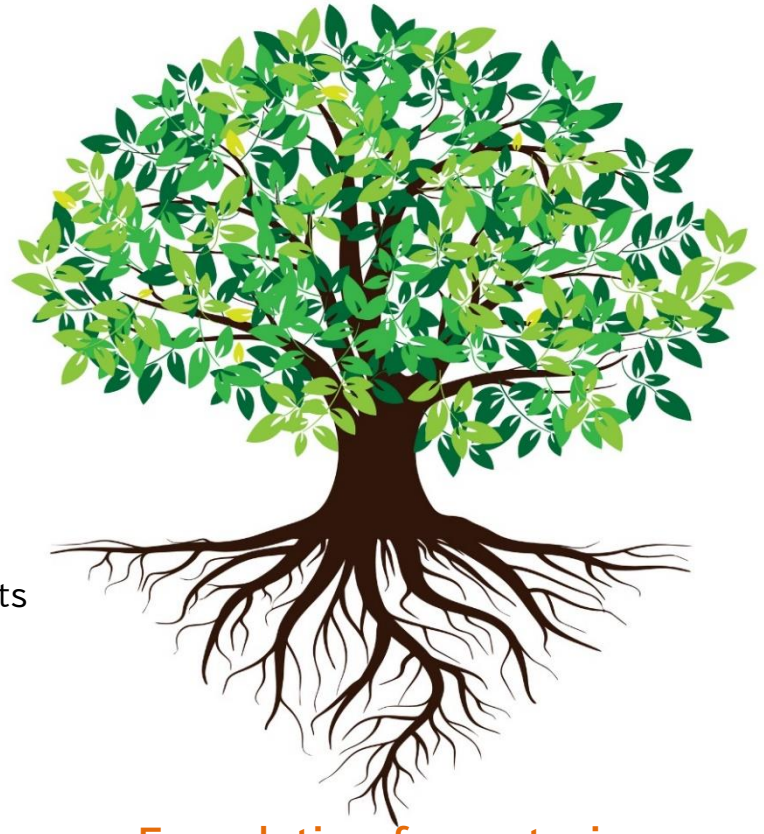
Different people have different values and different ways of thinking. Sometimes it is essential to put one’s values aside for a moment, respect differences, engage in dialogue, and listen to the opinions of others. By doing so, we can deepen our understanding of each other and flexibly expand our own perspectives. The result is the ability to **empathize with each other and work together to solve problems.**

- **What are authentic learning and growth as a human beings?**

Authentic learning is not merely the accumulation of knowledge and skills. **It is about cooperating with people with different values, understanding each other through dialogue, solving problems, and creating new knowledge and discoveries.** Through this process, **a rich and beautiful human consciousness is nurtured, leading to changes in behavior.**

“Research capability” and “Foundation for maturing research capabilities” derived from dialogue

Research capabilities



- **Driving force/philosophy of action**
  - Creativity and Knowledge Systematization
  - Intellectual curiosity and persistence
  - Ability to grasp the essence
- **Propulsion / Approach**
  - Ability to expand the value of research
  - Ability to work together to connect the baton
- **Environmental improvements**
  - Ensuring flexible environments
  - Ensure human resource mobility
  - Maintenance of facilities and equipment
- **Improvements in funding**
  - Introducing a variety of funding sources
  - Securing stable funds and positions
- **Cooperation with the society**
  - Communicate the appeal of research to society and expand the circle of support and assistance
- **The value that is expressed**
  - Novelty and Creativity
  - Social implementation capability
  - Ability to develop and utilize research results in society
- **Unexpressed and unnoticed value**
  - Valorization of all processes, including failures
- **Improved support for students, young and mid-career professionals**
  - Career development support
  - A system to train young and mid-career throughout the organization
  - Providing experiences related to research to the next generation
- **Promoting activities as a team**
  - Team-supportive research environment and culture
- **Cultural improvements**
  - Listening to the Voiceless

Foundation for maturing research capabilities

- **Improvements in research evaluation**
  - Breaking away from short-term results-oriented approach
  - Need for long-term perspective
  - Cross-disciplinary collaboration and the restructuring of evaluation systems
  - The harmful effects of “over-measuring” and the need to restructure evaluation systems