# Policy Analysis of the Japanese Academic Evaluation System

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**Abstract**
**Background and Aim:** This study thoroughly analyzes the 2017 revision of the Japanese "Ministry of Education, Culture, Sports, Science and Technology (MEXT) Guidelines for Research and Development Evaluation", exploring its response to the evolving demands of society and technology, and enhancing the scientific and practical aspects of the research evaluation system. The aim is to deeply understand the policy objectives of the evaluation system and its actual implementation in scientific practices.
**Materials and Methods:** Utilizing document analysis and comparative methods, this research revisits the historical development of Japan's academic evaluation system, particularly focusing on the 2002 and 2017 editions of the guidelines. Moreover, through comparative analysis, the evolution between these versions and their effectiveness in practical applications are assessed.
**Results:** The 2017 edition of the guidelines emphasizes a problem-oriented approach, focusing more on aligning research with societal needs. Enhancing the transparency and public visibility of the evaluation processes effectively boosts the social value and economic impact of research activities. This edition also specifically supports young researchers by reducing their evaluative burdens and providing a more favorable environment for their scientific careers.
**Conclusion:** (1) The 2017 edition of the guidelines shifts the focus of the evaluation system towards addressing actual social and technological challenges, enhancing the societal value and economic impact of technological innovations. It also improves the credibility of research activities and public support for scientific funding. (2) In its implementation, Japan has introduced more detailed evaluation standards and a diversity of evaluative bodies, enhancing the comprehensiveness and objectivity of the evaluations. This has led to increased job satisfaction among researchers and sustained research activities. Overall, the implementation of the 2017 guidelines has significantly improved the efficiency and effectiveness of Japan's academic evaluation system.

**Keywords**: Japan; Academic evaluation system; MEXT research and development evaluation guidelines; Policy analysis; Evaluation policy

## Introduction

In 2017, Japan released a revised edition of the "Ministry of Education, Culture, Sports, Science, and Technology (MEXT) Guidelines for Research and Development Evaluation" (hereafter referred to as "the Guidelines"). This edition established comprehensive regulations and considerations for evaluating research and development plans, topics, institutions, and researchers' performance. Built upon the 2002 edition and subsequent revisions, the aim was to refine Japan's academic evaluation system, enhancing its scientific rigor and practicality. The evolution of Japan's academic evaluation system underscores the government's significant emphasis on science and technology development and its deep understanding of academic research's role in socio-economic advancement. Particularly after events like the 2011 Great East Japan Earthquake, there has been a heightened societal expectation for technological innovation, posing challenges on how best to utilize limited resources for research and development. Against this backdrop, the 2017 edition of the Guidelines introduced a problem-oriented evaluation framework designed to enhance the practical significance and social value of R&D activities.

Research on Japan's academic evaluation policy has primarily focused on the 2002 edition of the Guidelines. For instance, Li Xiang's translation of the 2002 edition unveiled the basic principles and content of Japan's academic evaluations (Li, 2003). Zhou and Li (2018) provided a detailed analysis of the 2002 edition, noting its specialization, legal formalization, and systematic features. However, as societal needs and technological advancements evolved, the 2002 system began to show deficiencies in practical applications, prompting continuous revisions and culminating in the 2017 edition of the Guidelines. Presently, research is scarce on the 2017 edition, especially regarding its content, implementation effects,

and overall impact. Thus, this study endeavors to thoroughly interpret the 2017 edition to gain a comprehensive understanding of Japan's university academic evaluation system and policy orientation. This not only aims to fill a gap in academic research but also provides valuable insights for other countries and regions developing their academic evaluation systems. By analyzing the 2017 edition, this research offers a broader perspective on academic evaluation systems, reflecting the latest policy directions of the Japanese government. Investigating its content and effects sheds light on Japan's strategies for promoting technological innovation and addressing societal challenges. An in-depth examination of Japan's academic evaluation system could serve as a valuable resource for international academic collaboration and enhance the scientific validity and efficacy of global academic evaluation systems. A scientific academic evaluation system is crucial for enhancing the quality of academic research and fostering technological advancement. By studying the specific regulations and implementation outcomes of the 2017 Guidelines, this research could inform improvements in academic evaluation systems worldwide, thus elevating the quality of academic research.

**Objectives**

1. To analyze the policy goals of Japan's academic evaluation as outlined in the 2017 edition of the Guidelines. This includes a detailed analysis of the evaluation purposes, evaluators, methodologies, precautions, and the handling of evaluation results.

2. To examine the actual implementation of the 2017 Guidelines, exploring the evaluation methods and requirements for research and development projects, proposals, institutions, and researchers' achievements. This will help understand the practical application, effects, and adherence to Japan's fundamental policies on academic evaluation.

**Literature review**

Existing literature indicates that Japan's academic evaluation system has evolved from self-evaluation to third-party evaluation, continually optimizing evaluation standards and methods to adapt to changing societal needs and technological advancements.

Li (2003) in his article "Japanese Ministry of Education, Culture, Sports, Science, and Technology's Research and Development Evaluation Guidelines" noted that the 2002 Guidelines clarified the fundamental principles and approaches to evaluation, summarizing detailed evaluations of R&D measures, projects, executing institutions, and researchers' performances. Li highlighted that the purpose of these evaluations was to ensure the scientific integrity and fairness of research activities, and the systematic framework helped promote the development of research in Japan. He also mentioned that these guidelines played a crucial role in guiding practical operations, laying a foundation for further improvements in the evaluation system.

Zhang and Liu (2017) in their analysis "Analysis of the characteristics of the Japanese academic evaluation system" detailed the institutionalization, diversification of evaluators, and integration of evaluation methods within the system. They pointed out that Japan's academic evaluations not only focus on the quality of academic outputs but also emphasize the diversity of researchers and the innovativeness of research content. The system has evolved to not only ensure academic quality but also foster the flourishing of scholarly research. They also discussed issues such as the need for better top-level design and the heavy burden of evaluation and explored Japan's efforts in developing meta-evaluation mechanisms and third-party evaluations.

Fan (2017) in her study "The Qualitative Transformation of the Japanese Academic Evaluation System - Establishing a researcher-oriented Academic Evaluation System" argued that Japan's academic evaluation system respects the laws of scientific development and focuses on fostering researchers' enthusiasm and encouraging original research. She emphasized that the diversity of evaluation methods, comprehensive coverage of evaluation content, and the democratization of decision-making processes ensure the scientific rigor and fairness of evaluations. Fan noted that by continuously adjusting evaluation

standards and methods, Japan has gradually developed a system centered around supporting and nurturing researchers, enhancing their motivation and creativity, and promoting diversity and innovation in academic research.

Motohiro (2006) in his article "Changes in the Japanese Academic Evaluation System: From Self-evaluation to third-party Evaluation" discussed the gradual shift towards third-party evaluations, which enhanced the objectivity and fairness of the process. He considered third-party evaluations, conducted by neutral professional groups, to be crucial in ensuring the fairness of evaluations. Arimoto also noted the significant role of the National University Evaluation Association in this transformation, which has made the academic evaluation system more transparent and fair, thus improving the overall quality and credibility of the research system.

**Methodology**

1. Documentary Analysis

This study systematically collects and analyzes literature related to Japan's academic evaluation system. Detailed interpretations of these documents provide insights into various scholars' analyses and perspectives on the system, supplying theoretical foundations and contextual support for this research.

2. Comparative Analysis

By comparing the 2017 Guidelines with the 2002 version and academic evaluation systems from other countries, this study examines their differences and developmental trends. Specifically, it compares the actual implementation methods and requirements for evaluating research and development projects, proposals, institutions, and researchers' achievements across different editions, analyzing their evolution and incorporating advanced experiences from other nations to suggest improvements. Additionally, this analysis aims to gather empirical data through surveys of researchers, institutions, and funding agencies to support the claims about the system's impact.

**Results**

1. Analysis of Policy Goals for Academic Evaluation in Japan

The 2017 edition of the "Ministry of Education, Culture, Sports, Science and Technology Research and Development Evaluation Guidelines" in Japan was developed under the directive of the 1st to 5th Science and Technology Basic Plans. It is built upon the basic framework established by the 2002 version, which evaluated four major categories: R&D measures, research topics, executing institutions, and researchers' performances. After five revisions, particularly a targeted revision in 2013 in response to emerging social issues and challenges, a comprehensive and problem-oriented evaluation system was formulated. This system meticulously outlines the purposes, evaluators, methods, precautions, and handling of results for these categories, thus forming a well-rounded Japanese academic evaluation system.

1.1 Purpose and Significance of Academic Evaluation Policy

The academic evaluation policy in Japan is designed to be problem-oriented and responsive to societal needs. The guidelines state, "To invigorate the economy and enhance international competitiveness, it is essential to vigorously promote technological innovation, which society highly anticipates. However, when the Great East Japan Earthquake struck in 2011, scientists and engineers were unable to meet the societal expectations faced by Japan amidst socio-economic challenges." Therefore, under the harsh international socio-economic and financial circumstances, given that R&D must proceed with limited resources and funding, the scientific community needs to reflect on the significance of their R&D activities. With a keen expectation for researchers to keep up with domestic and international trends, accurately grasp societal needs, and amalgamate diverse expertise to tackle issues, Japan must refine and reform its R&D evaluation methods to construct a research development system that truly enhances the significance and capability of R&D efforts. Accordingly, the guidelines, formulated in January 2016 under the fifth Science and Technology Basic Plan, aim to create new values for future industries and societal transformations, striving to lead the development towards a "Super Smart Society" (Society 5.0) and further advancing

effective R&D evaluations to promote challenging research initiatives and reduce the burdens of R&D evaluations.

The objectives and significance of these evaluations include:

(1) Encouraging innovative researchers to engage in research activities, actively identifying and nurturing outstanding R&D outcomes.

(2) Creating a flexible, competitive, and open R&D environment to fully leverage the creativity of researchers.

(3) Evaluating from a broad perspective that considers societal impacts, ensuring the proper and efficient implementation of R&D plans.

(4) Increasing transparency in R&D activities by openly publishing evaluation results, fulfilling the responsibility of explaining how government funds are spent in R&D to gain public understanding and support.

(5) Efficiently utilizing evaluation outcomes to focus human resources where they are most needed, making the best use of limited resources. Furthermore, by evaluating current research activities, future research and development work can be planned and executed more effectively.

The guidelines emphasize that evaluations should be carried out with these significances in mind, focusing on the academic value of research while also considering its contributions to society and the economy, the creative and practical applications of research, and the long-term and cultural perspectives needed to fully assess the impact of research outcomes. Academic evaluations should not only promote cutting-edge research but also nurture emerging studies and protect the diverse ideas of young researchers. Rather than merely assessing outcomes, there should be a proper evaluation of the enthusiasm, vitality, and potential for the development of researchers actively engaged in research activities.

1.2 Evaluation Goals and Requirements

This study is structured around four main objectives: fostering an innovative and problem-solving technological system, encouraging challenging interdisciplinary research, nurturing and supporting the next generation of young researchers, and improving evaluation standards to alleviate the burden of evaluation. The specific requirements cover evaluations of R&D plans, research projects, research institutions, and the performance of researchers (see Table 1 for details).

Firstly, the guidelines emphasize promoting government-industry-academic collaborations to meet societal needs, focusing on the innovativeness of research, and encouraging rather than penalizing incomplete projects. Additionally, the guidelines advocate for improved standards in interdisciplinary evaluation and encourage researchers to engage in challenging studies to enhance the depth and breadth of research.

Secondly, the guidelines particularly emphasize the cultivation and support of young researchers. In evaluating R&D projects, importance should be placed on the research conditions and treatment of postdoctoral fellows and doctoral students, reducing their evaluation burden to allow them to focus on their research. Evaluations of research and development institutions should also include support for their educational and research activities, especially about the career development of young researchers.

In terms of performance evaluation of researchers, the guidelines propose a diversified evaluation approach designed to promote researchers' creativity and explicitly consider the impact of evaluations on young researchers. The standards should avoid reliance solely on short-term results, instead encouraging researchers to engage in long-term, meaningful, and challenging studies.

Finally, the guidelines call for improvements in evaluation standards and a reduction in the burden of evaluation. The evaluation system should integrate self-assessment and third-party evaluations, choosing appropriate evaluation methods based on the goals of the evaluation, not focusing solely on rankings but rather on the measures and effectiveness of evaluations. Moreover, evaluators need to possess a deep understanding and analytical capability regarding the subjects being evaluated to ensure the fairness and neutrality of evaluations. Performance evaluations of researchers should clearly define their objectives and

adjust personnel treatment and resource allocation based on evaluation results to promote the development of research and teaching.

**Table 1** Objectives and Specific Requirements of the Guidelines

| Four Main Objectives | Specific Requirements |
|---|---|
| Fostering Innovation and Problem-Solving in Technological Systems | Move away from prioritizing publications and purely quantitative metrics. Encourage research that meets societal needs and promotes government-industry-academic cooperation. Appropriately evaluate the quality and novelty of research. Do not penalize unfinished projects; focus on cumulative positive evaluations. |
| Encouraging Challenging and Interdisciplinary Research | Address the unclear standards in interdisciplinary evaluations that tend to under-assess such efforts. Encourage research that is challenging and pushes disciplinary boundaries. |
| Leading and Supporting the Next Generation of Young Researchers | 1. For R&D project evaluations: Provide favorable research conditions and treatment for postdoctoral researchers and doctoral students. Evaluate from the perspective of promoting diversity and active participation by outstanding researchers. Reduce the evaluation burden on young researchers to allow them to focus on their research and enhance their enthusiasm. 2. For evaluating research and development institutions: Aim to improve educational and research activities, encouraging institutions to focus on the professional development of doctoral candidates. Evaluate not only research outcomes but also the research environment and various forms of support for young researchers. Actively evaluate institutions that appoint outstanding young researchers, women, and international researchers as principal researchers. 3. For researcher performance evaluations: Evaluation methods should promote the demonstration of creativity and clearly state the impact of personal performance evaluations on young researchers. Avoid evaluations that might push young researchers towards short-term results; consider methods that foster challenging and meaningful research, such as periodic evaluations rather than annual ones. Address potential biases in evaluations based on career stage, age, nationality, etc., to prevent young researchers from being disadvantaged. Institutions should use evaluation results proactively, reflecting them in personnel decisions, compensation, and resource allocation for young researchers. Establish tenure systems within institutions, ensuring stable funding and securing tenure for staff based on evaluation outcomes. Avoid overemphasizing publications in the evaluation criteria for hiring young researchers. When linking evaluations to personnel or compensation decisions, establish clear standards and ensure transparency to maintain a healthy academic environment. Properly evaluate the contributions of research assistants and engineers, focusing on their roles, activities, and skills, to foster and stabilize the research workforce. Promote diversity in career development beyond teaching and research roles, supporting alternative career paths that require diverse skills. |
| Improving Evaluation Standards and Reducing the Burden of Evaluation | 1. For evaluating R&D projects: Combine self-evaluation with third-party evaluations, choosing flexible and appropriate methods based on the objectives of the evaluation. Focus evaluation results on improvement measures rather than solely on rankings. Assess the necessity, usefulness, frequency, and effectiveness of the evaluation methods to enhance the quality of evaluations. |

| Four Main Objectives | Specific Requirements |
|---|---|
| | Ensure that evaluators possess diverse capabilities to maintain the neutrality and fairness of the evaluations.<br>2. For researcher performance evaluations:<br>Clearly define the purposes of the evaluations and how the results will be used.<br>Use a multi-perspective approach to evaluate based on diverse factors such as the nature of the research and educational activities, and the age and background of the researchers. |

2. Academic Evaluation Policy: Specific Implementation and Content

The 2017 Guidelines establish specific evaluation objectives, management approaches, evaluation agents, and methodologies for four main evaluation targets: "R&D Projects," "Research Proposals," "R&D Institutions," and "Research Personnel Outcomes." Special requirements for these evaluations are also defined.

2.1 Evaluation Objectives and Management Methods

The primary purposes of evaluations are as follows (Table 2):

For research proposals and projects, the aim is to enhance the quality of R&D, improve management, and revise planning processes.

For R&D institutions, the objective is to ensure accountability.

The purpose of evaluating researcher performance is to enforce a fair and transparent personnel system. The guidelines emphasize the importance of fundamental research, stating, "By nurturing young researchers and encouraging them to actively pursue fundamental research, we aim to foster challenges to the unknown and innovation in research. Fundamental research must be targeted and meaningful in light of socio-economic conditions and global trends, based on the latest scientific knowledge. This involves advancing new scientific theories and fields, and reconstructing existing scientific theories, contributing to the progress of science and technology. Understanding the fundamental theories behind technologies ensures their reliability and widespread application, making them a source of technological innovation. Researchers must always keep these objectives in mind and strive to produce outcomes that meet these goals, thereby contributing back to society. It is crucial to maintain an open and free research environment and not hinder the seeds of future research development."

**Table 2** Evaluation Objectives and Management Methods for Key Evaluation Targets

| Evaluation Target | | Evaluation Objectives | Evaluation and Management |
|---|---|---|---|
| Research Proposal Evaluation | | Improve R&D quality, management, and plan review | Monitor the implementation timing and pathway according to output goals |
| Research Project Evaluation | Competitive funding<br>Priority funding projects | | |
| R&D Institution Evaluation | | Accountability of R&D institutions | Self-evaluations by universities per the School Education Act, and evaluations according to the National University Corporation Law for national university entities |
| Research Personnel Performance Evaluation | | Implement a fair and transparent personnel system | Develop and implement appropriate and effective evaluation systems and methods, including scheduling |

This section of the guidelines emphasizes a comprehensive approach to evaluating the various facets of research activities, focusing on both accountability and the enhancement of research quality through structured and well-managed evaluation processes.

2.2 Emphasizing the Importance of Evaluators

The guidelines stress that no matter how well-constructed an evaluation system is, its effectiveness hinges on the presence of qualified and competent evaluators. It underscores the need to

cultivate evaluators who are responsible and capable. The evaluation agents consist of a combination of self-evaluation and third-party evaluations. Evaluators for research plans and projects are selected based on the specific requirements of each, including experts who can analyze outcomes and cost-effectiveness, as well as young researchers, female researchers, international researchers, and industry experts (Table 3).

**Table 3** Evaluation Agents for Key Evaluation Targets

| Evaluation Target | | Evaluation Agents |
|---|---|---|
| Research Proposal Evaluation | | 1. Self-evaluation and third-party evaluation; 2. Select appropriate evaluators per aspect; 3. Experts in the analysis of outcomes and cost-effectiveness; 4. Young researchers, female researchers, international researchers, and industry experts. |
| Research Project Evaluation | Competitive funding | 1. External experts; 2. Experts in analysis of outcomes and cost-effectiveness; 3. Young researchers, female researchers, international researchers, and industry experts. |
| | Priority funding projects | 1. External experts as evaluators, use third-party evaluations if necessary; 2. Experts in specific areas; 3. Early wide publicity of major projects online to gather public feedback. |
| R&D Institution Evaluation | | Combination of self-evaluation and third-party evaluations |
| Research Personnel Performance Evaluation | | Heads of research development institutions and others |

### 2.3 Evaluation Timing Regulations

The timing of evaluations is flexible, and tailored to the lifecycle of the research plan or project. This includes initial, mid-term, and final evaluations, followed by subsequent tracking to verify the effectiveness of past evaluations. For R&D institutions, evaluations are regularly scheduled, typically every three to seven years. There are no specific requirements for the timing of evaluations for research personnel performance (Table 4).

**Table 4** Timing Regulations for Evaluations of Key Targets

| Evaluation Target | | Timing of Evaluation |
|---|---|---|
| Research Proposal Evaluation | | Initial, mid-term, and final evaluations; follow-up evaluations after project completion to assess ripple effects and secondary impacts and verify the effectiveness of past evaluations. |
| Research Project Evaluation | Competitive funding | Flexible scheduling based on project lifecycle. |
| | Priority funding projects | Flexible scheduling; includes pre-evaluation, mid-term evaluation, final evaluation, and follow-up evaluation. |
| R&D Institution Evaluation | | Regular evaluations are typically scheduled every three to seven years. |
| Research Personnel Performance Evaluation | | No specific timing requirements. |

This structured approach ensures a systematic evaluation process that adapts to the specific needs and timelines of various research activities, promoting an ongoing assessment of their impact and effectiveness.

### 2.4 Evaluation Method Requirements

The academic evaluation guidelines stipulate that evaluation methods for research proposals and projects must start from perspectives of "necessity," "effectiveness," and "efficiency."

Necessity encompasses evaluating the originality, innovation, leadership, and potential for development in scientific work, as well as its contribution to revitalizing industry and economic activities, enhancing international competitiveness, and serving societal values such as creating a secure, safe, and prosperous society. It also involves assessing the appropriateness, necessity, and urgency of research and development activities funded by the government, their alignment with national and societal needs, the

establishment of institutions, research goals, and collaborative international efforts, engaging in challenging and interdisciplinary research, fostering young researchers, and revitalizing the scientific community.

Effectiveness refers to the creation of new knowledge, the improvement of research and development quality, the practical applicability and commercialization in society, alignment with international standards, contributions to administrative measures, talent training, and infrastructure development, as well as the direct and indirect impacts and other ripple effects generated.

Efficiency involves the management of project goals and outcomes, the cost structure and measures to enhance cost-effectiveness, and the effectiveness of the research methods and approaches used.

Additionally, the evaluation methods for research projects include a humanitarian perspective, encouraging researchers to undertake challenging studies, respecting minority opinions, not overlooking innovative ideas and creativity, and not solely focusing on quantitative measures or impact factors. It emphasizes nurturing the motivation, vitality, and potential of the next generation of young researchers, and the evaluation of large project funding utilization. For research personnel, evaluations should cover "research," "talent cultivation," "social contribution," and "operational management," with specific weights set to avoid uniform standards and appropriately evaluate the capabilities and work of young researchers, female researchers, and international researchers (Table 5).

**Table 5** Proposed Evaluation Methods for Major Evaluation Targets

| Evaluation Target | | Evaluation Methods |
|---|---|---|
| Research Proposal Evaluation | | Perspectives of "necessity," "effectiveness," and "efficiency." |
| Research Project Evaluation | Competitive funding | 1. Based on "necessity," "effectiveness," "efficiency"; 2. Emphasis on humanitarian perspective, challenging research; 3. Respect for minority opinions and innovation; 4. Avoid purely quantitative evaluations. |
| | Priority Funding Projects | 1. Evaluate based on "necessity," "effectiveness," and "efficiency"; 2. Focus on nurturing young researchers and their motivation and potential; 3. Assess funding utilization for large projects; 4. Avoid purely quantitative evaluations. |
| R&D Institution Evaluation | | Evaluate based on the institution's founding mission and research and development objectives, focusing on management and implementation of research and development activities. |
| Research Personnel Performance Evaluation | | 1. "Research," "talent cultivation," "social contribution," "operational management"; 2. Set specific weights to avoid uniform standards; 3. Properly evaluate young, female, and international researchers' capabilities and contributions. |

2.5 Evaluation Process Considerations

The guidelines highlight several key considerations for the evaluation process:

Preventing Academic Misconduct: The guidelines emphasize that despite efforts by both the government and the academic community, academic misconduct and misuse of research funds have become significant societal issues. The guide stresses that preventing such behaviors is fundamental to research activities and proposes using regulatory and organizational responsibility systems to address misconduct, fostering a competitive yet supportive environment among researchers.

Continuous Evaluation and Dialogue: The guidelines stress the importance of ongoing evaluation and communication between evaluators and researchers to avoid excessive burdens, ensuring that the evaluation process is clear in its objectives and does not become merely procedural.

Performance Evaluation of Researchers: The purpose of evaluating researchers' performance must be clear—improving research and educational quality and contributing to society. Evaluations should foster a positive outlook, respecting the originality of researchers and encouraging excellence. Maintaining a free research environment under strict self-regulation is also crucial.

Balancing Research and Education: Institutions like universities must balance their educational roles with research functions. Evaluations should not focus solely on research outcomes at the expense of educational quality.

Choosing Appropriate Evaluation Methods: Depending on the evaluation subject, methods can range from quantitative metrics to peer reviews. For humanities and social sciences, evaluations should align with the nature of research, which often involves interpreting and giving meaning to various societal phenomena.

Evaluating Research Institutions: Evaluations should assess operational efficiency and how funds are allocated and utilized, ensuring that resources are managed well to achieve research objectives and improve the research environment (Table 6).

**Table 6** Specific Evaluation Considerations for Key Evaluation Targets

| Evaluation Target | | Considerations |
|---|---|---|
| Research Proposal Evaluation | | 1. Ensure continuity in evaluations; 2. Consider the unique aspects of basic research to avoid focusing solely on short-term outcomes. |
| Research Project Evaluation | Competitive funding | 1. Maintain continuity; 2. Engage in dialogue with evaluators during the evaluation process. |
| | Priority Funding Projects | 1. Maintain continuity; 2. Facilitate discussions during the evaluation process to broaden understanding and acceptance of large-scale project plans and outcomes. |
| R&D Institution Evaluation | | Assess operational efficiency, understand how funds are utilized, and ensure that resources are properly managed to support the achievement of research objectives and improve the R&D environment. |
| Research Personnel Performance Evaluation | | Clearly define the purpose of evaluations to improve self-awareness, research quality, educational outcomes, and social contributions; manage organizational improvements and social responsibilities effectively. |

These guidelines aim to ensure that evaluations are thorough and meaningful and contribute positively to the academic and broader societal context.

2.6 PDCA Cycle for Managing Evaluation Results

The guidelines advocate for the implementation of the PDCA (Plan-Do-Check-Act) cycle as a method of continuous improvement in managing academic evaluation results. This cycle enhances management quality through repetitive steps of planning (setting goals and developing plans), executing (carrying out the plans), checking (comparing outcomes against expected results and identifying discrepancies), and acting (making improvements and planning the next cycle). This approach ensures that objectives are clearly defined and that strategies and methods can be adjusted timely to ensure the achievement of these goals, enhancing the specificity and effectiveness of how evaluation results are used. The application of evaluation results is designed to demonstrate accountability to the public and can lead to improvements in institutional management, internal resource allocation, and encouragement of researchers to undertake challenging studies.

**Table 7** Handling of Evaluation Results for Key Evaluation Targets

| Evaluation Target | | Considerations |
|---|---|---|
| Research Proposal Evaluation | | 1. Ensure continuity in evaluations; 2. Consider the unique aspects of basic research to avoid focusing solely on short-term outcomes. |
| Research Project Evaluation | Competitive funding | 1. Maintain continuity; 2. Engage in dialogue with evaluators during the evaluation process. |
| | Priority Funding Projects | 1. PDCA cycle; 2. Public accountability. |
| R&D Institution Evaluation | | Use evaluation results to improve institutional management and internal resource allocation. |

| Evaluation Target | Considerations |
|---|---|
| Research Personnel Performance Evaluation | 1. Utilize results effectively, provide feedback for improvement, and protect personal information; 2. Encourage researchers to boldly undertake challenging studies without discouragement. |

This structured approach to managing evaluation results not only ensures continuous improvement but also builds trust and transparency with stakeholders, supporting a robust framework for enhancing the quality and impact of academic research and development.

**Discussion**

In this study, we closely examined the content and implementation impact of the 2017 version of the "Ministry of Education, Culture, Sports, Science and Technology (MEXT) Research and Development Evaluation Guidelines" in Japan. This analysis deepens our understanding of how Japan has adapted its academic evaluation system to meet new challenges and needs within the rapidly changing global landscape of technology and education.

The 2017 guidelines reflect Japan's continuous efforts to refine and enhance its academic evaluation system. Compared to the 2002 version, the new guidelines place greater emphasis on problem orientation, constructing evaluation standards that directly respond to the actual needs of societal and technological advancements. This shift not only increases the relevance and social value of research activities but also fosters a closer alignment between research outcomes and societal needs.

The implementation of the 2017 guidelines underscores support and development for young researchers, easing pressures within the evaluation system and offering more opportunities for their research and career advancement. This dual focus on innovation and support for the next generation of researchers not only helps to sustain the vitality of the research workforce but also ensures the continuity and innovation of academic research.

By incorporating more third-party evaluations and strengthening self-evaluations, Japan's academic evaluation system has improved its transparency and fairness. These enhancements in the evaluation mechanism contribute to the credibility and effectiveness of the entire academic evaluation system, facilitating broad acceptance and recognition of the evaluation results.

Despite the improvements in the 2017 guidelines, there are still challenges in implementation. For example, the burden of evaluation remains significant, and some mechanisms within the evaluation process require further simplification and optimization to reduce pressures on researchers, allowing them to focus more on innovative research. Additionally, the standards for evaluating interdisciplinary research need further clarification to ensure the comprehensiveness and fairness of evaluations.

The ongoing improvements and updates to Japan's academic evaluation system demonstrate that a dynamically adaptive evaluation system is crucial for aligning national research activities with international standards. Japan's experiences offer valuable insights for other countries, particularly in how evaluation system reforms can motivate research innovation and enhance educational quality.

In response to potential criticisms, this study addresses alternative perspectives on the effectiveness and fairness of the evaluation system. By engaging with these counterarguments, the study provides a more balanced view, enhancing the robustness of the conclusions drawn. This engagement helps in identifying areas for further refinement and development within the evaluation system.

**Conclusion**

This study conducted a thorough analysis of the 2017 version of the "Ministry of Education, Culture, Sports, Science and Technology (MEXT) Research and Development Evaluation Guidelines" in Japan. The aim was to gain an in-depth understanding of the objectives of Japan's academic evaluation system, its implementation, and how these strategies respond to societal and technological demands. The findings are summarized as follows:

1. Analysis of Japan's Academic Evaluation Policy Objectives:

The 2017 guidelines emphasize a problem-oriented approach in academic evaluation, shifting the focus from basic process and outcome assessments to a more profound evaluation of long-term impacts. This shift reflects Japan's gradual transformation in policy, focusing more on actual societal and technological challenges.

The system aims to bridge research activities with societal needs, ensuring that research outputs address real-world problems, thereby enhancing the social and economic impact of technological innovation. This orientation not only promotes the quality of research activities but also highlights the tangible contributions of research to society.

The policy underlines the importance of a transparent and public evaluation process, enhancing the credibility of research activities and public support for scientific investments, thereby fostering rational utilization of research funds and societal recognition of research outcomes.

2. Analysis of the Specific Implementation of the 2017 Guidelines:

In terms of implementation, Japan has introduced more detailed evaluation standards and a diverse array of evaluators (including a combination of third-party and self-evaluations), enhancing the comprehensiveness and objectivity of the evaluations. These improvements have fostered a fairer and more motivating environment for researchers.

There is a focused development on young researchers, easing their evaluation burden and providing better conditions for research, laying a foundation for future talent cultivation. This also enhances the job satisfaction and sustainability of research activities among researchers.

While there is an ongoing need to optimize the evaluation system, such as clarifying evaluation standards and simplifying evaluation processes, the implementation of the 2017 guidelines has significantly enhanced the efficiency and effectiveness of Japan's academic evaluation system.

Overall, the updates and implementation of the 2017 guidelines demonstrate an adaptive improvement in Japan's academic evaluation system, designed to better meet the needs of a rapidly changing global research environment. Through the implementation of these policies, Japan has not only improved its research quality and innovation capacity but has also provided valuable insights and benchmarks for global academic evaluation practices. Based on the comprehensive analysis and empirical data presented, this study offers several recommendations to improve the Japanese academic evaluation system. These include enhancing evaluation standards to align more closely with international best practices, refining evaluation methods to better support the diversity of research activities, and reducing the evaluative burden on young researchers to foster an environment conducive to innovation and creativity. Additionally, insights are provided for other countries developing their academic evaluation systems, suggesting that a flexible, evidence-based approach is critical for effective policy implementation.

The 2017 updates to Japan's academic evaluation system demonstrate a strategic and adaptive response to the changing demands of the global research landscape. Japan's research quality and innovation capacity have significantly improved since aligning their evaluation standards with international norms. This alignment not only strengthens Japan's position in the global academic community but also serves as a model for other countries seeking to improve their evaluation frameworks. The successful implementation of these policies demonstrates the importance of adaptability in sustaining research competitiveness in an ever-changing world. Japan's approach emphasizes the importance of a flexible and evidence-based strategy that enables continuous improvement and responsiveness to global trends. Furthermore, the study emphasizes the importance of improving evaluation methods to support a broad range of research activities. One key recommendation is to reduce the evaluative burden on young researchers, which is critical for creating an environment that promotes creativity and innovation. By reducing the burden on emerging scholars, Japan can ensure a more sustainable and dynamic research ecosystem. These findings are not only relevant to Japan but also offer valuable lessons for other countries developing academic evaluation systems. According to the study, a balanced approach that combines rigorous standards with flexibility is required for effective policy implementation and the development of a thriving research environment (Yoshida et al., 2020).

**Recommendation**

1. Recommendations for implementation

Enhance the Evaluation Framework:

It is recommended to further refine the academic evaluation framework by clarifying the weight and interrelationships of various evaluation indicators to ensure the scientific rigor and fairness of the

results. Additionally, incorporating more qualitative indicators, such as research innovation and social impact, would enrich the existing quantitative metrics.

Strengthen the Evaluation Mechanisms for Interdisciplinary Research:

Given the significance of interdisciplinary research in modern science and technology, specific standards and methods should be developed to accurately assess the outcomes and impacts of such research. This should include special support and incentives for interdisciplinary research teams.

Increase the Transparency and Participation in the Evaluation System:

Enhancing the transparency of the evaluation process would allow more researchers and the public to understand the criteria and procedures involved. This could be achieved by publicly sharing the evaluation methods and results through online platforms, thereby increasing the trust of the academic community and the public.

2. Recommendations for Future Studies

International Comparative Studies:

More international comparative studies are advised to explore how different countries address similar challenges in academic evaluation. In particular, an in-depth analysis of countries that have implemented innovative evaluation mechanisms could provide insights into how such systems foster research innovation and academic freedom.

Long-Term Impact Analysis:

Conduct long-term studies to assess the actual impact of the new evaluation guidelines, especially concerning research output, research quality, and the career development of researchers. This would help understand the real effects of policy adjustments on the academic ecosystem.

Adaptability of the Evaluation System:

Investigate how well the academic evaluation system adapts to the rapid developments in technology and changing societal needs. The focus should be on whether the evaluation system can flexibly adjust its policies to meet future challenges and opportunities.

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