The Current Status on Research Quality Management by Conducting Online Survey in Thailand.

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ABSTRACT

The National Science and Technology Development Agency (NSTDA) has established the division of Research Quality Management (RQM) since 2016 to promote good practices of research. In evaluating research quality, online survey was conducted. This aims to determine the quality practices of collaborating partners.

The studied population is NSTDA collaborators and grantee researchers in the past five years (2016-2021). The questionnaire consisted of three parts, demographic, current practices in research and understanding of good research practices (including record keeping, authorship, research equipment management, reproducibility, Technology Readiness Level (TRL)), and perspective of research quality improvement.

22.6% of 1236 surveyed population responded. The majority (78%) used or intended to use an appropriate laboratory notebook format for their research (experimental, computational, theoretical, software & programming, etc.). However, only 11% followed good record keeping practices to ensure IP protection. Regarding to authorship practices, 63% reported the lack of institutional policy. 53% agreed with all four criteria of ICMJE. 36% of respondents always defined output specification in the beginning of project and 59% tried to ensure reproducibility of their research results.

This information is useful for improving research management system. Trainings in research quality (RCR, RI, etc.) are necessary. It is also important to have the proper research culture and the appropriate mentoring system in the organizations.

INTRODUCTION

Thailand National Science and Technology Development Agency (NSTDA) under the Ministry of Higher Education, Science, Research, and Innovation (HESRI) has a mission to drive S&T and innovation by research, development, design and engineering, technology transfer, human resource development, infrastructure development, and efficient internal management.

The Division of Research Quality Management (RQM) was established in 2016 to promote good research practices regarding to responsible conduct of research (RCR) for example data management (focusing on research record keeping), authorship, and enhancing the internal research process to meet related standards and requirements.

This study explored research quality situation in Thailand aimed to understand NSTDA collaborators' status and address the issues for research quality improvement to enhance reliability.

METHODOLOGIES

Define the objectives, scope of the research quality issues and population selection criteria.

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Design questionnaire, preliminary assessment by reviewers and submit to IRB.

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Conduct online survey using Lime Survey platform together with paper survey via mail. (respondent number need to be more than 10% of target population)
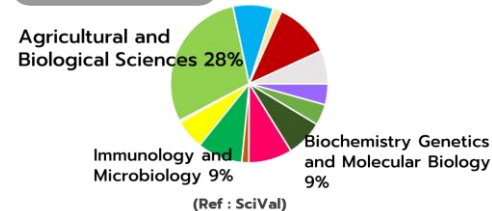
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Collect and Analyze data using the Pivot Table statistics tool.

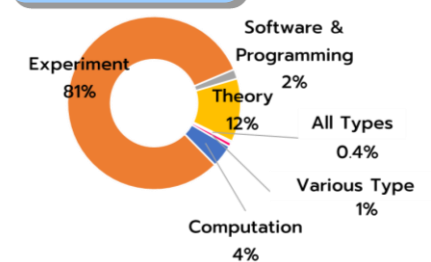⬇

Summarize and provide report with aggregated data.

DEMOGRAPHIC DATA

Target population : NSTDA collaborators from the past 5 years totally 1,236
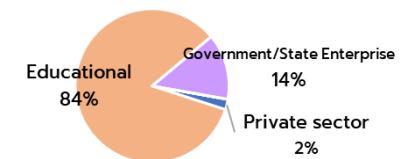Totally 279 NSTDA collaborators responded to the survey.

Research Field

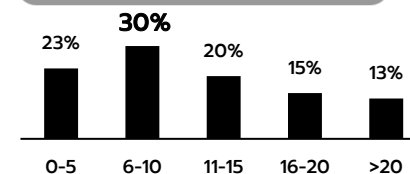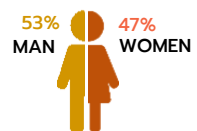Agricultural and Biological Sciences 28%
Immunology and Microbiology 9%
Biochemistry Genetics and Molecular Biology 9%
(Ref : SciVal)

Type of Research

Experiment 81%
Software & Programming 2%
Theory 12%
All Types 0.4%
Various Type 1%
Computation 4%

Education Background

Ph.D. 80%   Master 16%   Bachelor 4%   Other 0.4%

Affiliation

Educational 84%
Government/State Enterprise 14%
Private sector 2%

Experience in Research (year)

23% (0-5)   30% (6-10)   20% (11-15)   15% (16-20)   13% (>20)

Gender

MAN 53%   WOMEN 47%

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RESULTS & CONCLUSION
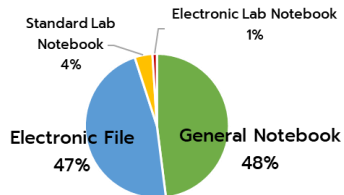
Record Keeping

Figure 1.Record Keeping Format
(The respondents can have more than one response)

- About 78% of the respondents use the appropriate format of lab notebook which related to their research practice.
- Only 11% of the respondents will use lab notebooks as evidence to prove their intellectual properties.

- The survey found that the most popular record keeping format is general notebooks (48%) followed by electronic files, such as Microsoft Offices, (47%) while standard lab notebooks are used only 4%. (Figure 1.)
- More than half (56%) of respondents do not have a record keeping policy or regulation relating to lab notebook as the property of the organization.

Technology Readiness Level (TRL)

- Technology Readiness Level (TRL) is a tool for communicating the maturity of technology which consist of 9 levels. Researchers also use TRL for project management. Thai funding agencies apply TRL in their grant. The survey results found that about 53% of respondents know TRL. There are only 30% of respondents use TRL to evaluate the research output.

Verification & Validation

- 46% of the respondents usually define specifications for research outputs and 50% of the respondents are in the private sector, they identify specifications in all their research.
- Most of the respondents use research articles, reviewed by independent experts, and self-reproduce test reports as empirical evidence for deliverables verification.
- Research owner (65%), co-researcher (48%) and expert (44%) are the top three persons who confirm the reproducibility of research outputs while supervisor and customer/technology licensee contribute only 8% and 11% respectively.

Authorship

- Most of the respondents (69%) know authorship criteria. We found that research assistants are the most unknown. (Figure 2.)
- About 63% of respondents' institutes have no policy or principle of authorship. They followed research culture and team agreements.
- About 10% of surveyees agree that the contribution in language editing should be included as an author
- 53% answered that an author should meet all 4 criteria of ICMJE
- First Last Author Emphasis (FLAE) is commonly used for authors sequencing in academic publications (65%) (Table 2)
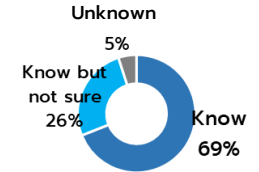

Figure 2. Awareness of Authorship Criteria

Table 1. Opinion about ICMJE Criteria (Each Criteria)

ICMJE Criteria	Agree with Criteria (%)
Substantial contributions to the conception or design of the work	99%
Drafting the work or revising it critically for important intellectual content	97%
Final approval of the version to be published	70%
Agreement to be accountable for all aspects of the work	81%

Table 2. Frequency of Practice of Author Sequences in Publication

Practice of Author Sequences in Publication	Frequency (%)
First-Last-Author-Emphasis (FLAE)	65%
Sequence Determines Credit (SDC)	19%
Percent-Contribution-indicated Approach (PCI)	12%
Other	4%

CONCLUSION

A research quality survey is an efficient simple tool for improving research quality in Thailand driven by advocacy for good research principles. From the survey result, e-file is mostly used as a tool for record keeping. Therefore, NSTDA plans to develop an electronic lab notebook system for supporting good research data management. NSTDA Authorship guidelines will distribute to encourage Thai researchers. Besides, TRL should be promoted as a tool for research project management in research institutions and research funding organizations. Not only use TRL as the criteria for research granting but target setting, planning, monitoring, and cost estimation. TRL also support research reproducibility, verification & validation system. NSTDA implemented TRL in internal process to ensure the quality of research output meets the specification and is usable in a delivery environment. NSTDA has TRL assessment manual and e-learning material for advocacy any researchers.

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