

Enhancing Quantitative Methodology Literacy through Mediation Analysis Training for PERMITHA Thailand Students

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ABSTRACT

Mediation analysis has become an essential component for students in conducting quantitative research. This community service program aimed to enhance the quantitative methodology literacy of Indonesian PERMITHA students in Thailand. The activity was carried out on May 2–4, 2025 at Kasetsart University, Bangkok, with a total of 20 participants. The training consisted of several stages, including coordination with partners, module development, training sessions, mentoring, and evaluation. The implementation focused on delivering fundamental concepts of mediation, as well as interactive discussions. The results indicated that students were able to understand the distinction between direct and indirect effects. This program contributes to strengthening the research capacity of Indonesian students abroad and fosters international academic networking.

INTRODUCTION

The ability to conduct scientific research is an essential skill that every student must possess. Students are required to complete final projects and engage in academic publications, which necessitates knowledge of data analysis (Susilo et al., 2025). With the increasing demand for higher-quality student research, understanding more advanced data analysis methods has become crucial (Fitria & Prastiwi, 2022). One of the important techniques to master is mediation analysis, which explains indirect relationships between variables through a mediator variable (Iacobucci, 2008; Preacher & Hayes, 2008). Mastery of mediation analysis not only enriches students' analytical abilities but also strengthens the validity and scientific contribution of their research. Mastery of this method not only enriches analytical abilities but also strengthens the validity of student research (Sahabuddin et al., 2024).

Indonesian students studying abroad, including in Thailand, face particular challenges in accessing in-depth and applicable research methodology training (Oduwaye et al., 2023). PERMITHA (Indonesian Student Association in Thailand) is a student community with significant potential for advancing academic research. However, based on preliminary discussions with PERMITHA leaders, many students still struggle to understand and apply mediation analysis in quantitative research. The gap in research skills and academic adaptation challenges among international students highlights the importance of structured training interventions to strengthen their research capacity (Deuchar, 2022). Furthermore, institutional support and orientation play a crucial role in facilitating their learning process (Mugirotin & Mulawarman, 2023). PERMITHA (Indonesian Student Association in Thailand) has significant potential for academic development, yet many students still struggle to apply mediation analysis. Previous activities mainly focused on basic regression, without addressing more advanced analytical techniques. With the growing demand for international publications and more rigorous thesis requirements, the absence of targeted training in mediation analysis represents a significant gap.

This gap underscores the urgency of structured training interventions at present. By equipping students with mediation analysis skills, this program not only addresses current methodological deficiencies but also prepares them for higher-level research expectations in their academic careers. The program thus responds to both immediate and long-term needs of Indonesian students abroad, while fostering international academic networking.

The contribution of this program lies in its concrete efforts to build the research capacity of Indonesian students abroad. Beyond expanding quantitative methodology literacy, the training also fosters academic networking between students and higher education institutions in Indonesia. It is expected that this program will not only improve the quality of student research but also generate long-term impacts through cross-country academic collaboration and the sustainable development of students' research competencies.

IMPLEMENTATION AND METHODS

The Community Service Program (PKM) on Mediation Analysis Training was carried out in collaboration with the Indonesian Student Association in Thailand (PERMITHA). The training took place at Kasetsart University, Bangkok, on May 2–4, 2025. The program conducted over three days, consisting of material presentations, data analysis practice, and evaluation sessions.

The participants were active Indonesian students who are members of PERMITHA. A total of 20 students participated in this activity. Based on the pre-survey results, most of the participants had previously taken research methodology courses but still lacked a deep understanding of mediation analysis.

The implementation method was divided into several stages as follows:

1. Coordination with Partners

The initial coordination stage with partners was crucial in identifying the needs and challenges faced (Rakhmawati et al., 2025). At this stage, the PKM team coordinated with PERMITHA's board to identify training needs and determine the technical aspects of implementation, including scheduling and media to be used.

2. Material Presentation

In this stage, the trainers delivered the fundamental concepts of mediation analysis, its differences from moderation analysis, and the urgency of applying this technique in quantitative research. The material presentation served as a strategy to address research-related difficulties faced by PERMITHA students regarding mediation analysis.

3. Discussion

In this stage, interactive discussions were facilitated to deepen their understanding of data analysis.

4. Evaluation and Reflection

The final stage consisted of evaluation and reflection with the students and partner representatives to assess the outcomes. Participants were given evaluation questionnaires to measure their improvement in understanding. The PKM team then conducted a reflection session with partners regarding the effectiveness of the activity and opportunities for follow-up.

RESULTS AND DISCUSSION

Coordination with Partners

The first stage of this community service program was coordination with the PERMITHA Thailand committee. Through a Zoom meeting, we agreed on the training needs, activity schedule, and implementation media. The initial discussion revealed that students required training in research methodology, particularly in mediation analysis, as most of them faced difficulties in understanding the distinction between direct and indirect effects. Based on these findings, the PKM team developed a training module that included theoretical concepts and methodological approaches.

Program Implementation

The training was conducted on May 2–4, 2025, at Kasetsart University, Bangkok, with 20 Indonesian students who are members of PERMITHA participating. The program lasted three days and consisted of several sessions, including material presentations and discussions.

The methods were divided into three systematic stages:

1. Pre-Activity Stage

- Coordination with PERMITHA leadership to identify training needs and challenges.
- Distribution of a pre-survey to assess students' prior knowledge of mediation analysis.
- Development of training modules and supporting learning media (posters and step-by-step guides).

2. Implementation Stage

- Material Presentation: Trainers delivered the theoretical foundations of mediation analysis, differences from moderation analysis, and its urgency in quantitative research.
- Discussions: Deepening their conceptual and technical understanding through interactive dialogue.

3. Evaluation Stage

- Reflection sessions with students and PERMITHA representatives to evaluate program effectiveness.
- Identification of opportunities for follow-up training, such as moderation analysis and advanced structural modelling.



Figure 1. Program Implementation

Training Materials

The training materials covered several key aspects of mediation analysis, including:

- a. The basic concepts of mediation, namely the distinction between direct effect, indirect effect, and total effect.
- b. Classical mediation analysis, including the Baron & Kenny approach and the Sobel Test (Baron & Kenny, 1986; Solimun & Fernandes, 2017)
- c. Modern mediation analysis.
- d. Practical interpretation of outputs.
- e. Common errors in mediation analysis, such as choosing inappropriate models, lack of theoretical justification, and misinterpretation of results.

- f. Practical tips for conducting successful mediation analysis, including the importance of a strong theoretical foundation and transparency in reporting results.



Figure 2. Mediation Analysis Poster

Results and Findings

The training successfully enhanced students' understanding and technical skills. The training module and supporting poster materials also facilitated participants in following the step-by-step procedures of the analysis.

Table 1. Results and Findings

| Assessed Aspect | Initial Condition of Participants | Final Condition of Participants |
|-------------------------------------|--|--|
| Understanding of mediation concepts | Low (only familiar with basic regression) | Improved (able to explain direct and indirect effects) |
| Attitude toward mediation analysis | Considered difficult and complicated | More confident and ready to apply |

Discussion

This program demonstrates that practice-based training can effectively improve students' quantitative methodology literacy, particularly in the application of mediation analysis. These findings are consistent with (Preacher & Hayes, 2008), who emphasize the importance of understanding mediation effects in quantitative research.

Beyond technical skills, the training also highlighted the importance of theoretical understanding before conducting analysis, as reflected in the “Success Tips” session, which the participants highly appreciated. Therefore, the main contribution of this program lies not only in strengthening students’ statistical skills but also in shaping their methodological mindset to design higher-quality research.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The training program successfully improved the quantitative methodology literacy of PERMITHA students in Thailand. Students gained both conceptual and technical mastery of mediation analysis and became more confident in it. The provision of structured modules and supporting media helped participants systematically learn analytical procedures. The program not only strengthened skills but also shifted students’ mindset toward the importance of methodological rigor.

Recommendations

Based on the results, several recommendations can be proposed. First, students are encouraged to apply mediation analysis skills in their theses, dissertations, and academic publications, while continuing to practice independently. Second, PERMITHA is recommended to establish sustainable collaborations with Indonesian universities to organize further training, such as moderation analysis or more advanced structural modelling. Third, the PKM team should enrich the training modules by incorporating student research case studies to make the materials more contextual and relevant. Finally, similar training programs should be institutionalized as annual activities to broaden their impact, strengthen academic networks among Indonesian students abroad, and enhance the overall quality of student research outputs.

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