I B A D A H
Journal of Community Empowerment and Service
Publisher By Faculty of Tarbiyah Institut Agama Islam Negeri Bone.
Address: HOS Cokroaminoto Street, Watampone, South Sulawesi, Indonesia.
Email: journalibadah@gmail.com / journalibadah@iain-bone.ac.id

ENHANCING STATISTICAL LITERACY AMONG SDI 3/77 KANCO TEACHERS PROMOTING CONTINUOUS DATA-DRIVEN EDUCATIONAL IMPROVEMENT

Sri Wahyuni[1]
[1]*Islamic Religious Education Study Program, Faculty of Tarbiyah, State Islamic Institute of Bone, Indonesia*

Corresponding Author: Sri Wahyuni (srhieunhy@gmail.com)

Keywords:
Statistical literacy, Teacher training, Data-driven decision making

Article History:
Received: September 11, 2026
Accepted: October 3, 2026
Published: October 30, 2026

ABSTRACT
The capacity to utilize assessment data remains a significant hurdle in primary education, particularly within rural settings where teachers often lack foundational statistical skills to convert raw scores into actionable pedagogical strategies. Addressing this gap, a community service initiative was executed at SD Inpres 3/77 Kanco in Bone Regency, aiming to elevate the statistical literacy of primary school educators. The program adopted a Participatory Action Research (PAR) methodology, progressing through collaborative needs assessments, interactive workshops using accessible tools like Microsoft Excel, and sustained classroom mentoring. Evaluation metrics highlighted a tangible improvement in the participants' conceptual grasp, with average test scores rising from an initial 77.3 to a post-intervention 83.3. Beyond quantitative gains, the initiative successfully catalyzed a cultural shift among the teaching staff. Instructional planning evolved from relying on subjective assumptions to embracing evidence-based decision-making. Consequently, the school enhanced its diagnostic assessment capabilities and strengthened its institutional readiness to deliver highly targeted, differentiated learning programs that directly address individual student needs.

How to cite:
Wahyuni, S. (2026). Enhancing statistical literacy among SDI 3/77 Kanco teachers promoting continuous data-driven educational improvement. *Ibadah: Journal of Community Empowerment and Service, 1*(2).

INTRODUCTION

Sustainable community development relies heavily on the quality of education. In today's educational paradigm, analyzing statistical data is no longer optional; it is a critical requirement for mapping student progress, identifying

Author(s) retain copyright and grant the journal right of first publication with the work simultaneously licensed under a Creative Commons Attribution-ShareAlike License (CC BY-SA 4.0) that allows others to share the work with an acknowledgement of the work's authorship and initial publication in this journal.

learning bottlenecks, and formulating precise academic interventions (Creswell & Creswell, 2017). Despite the constant generation of assessment scores in schools, a prevalent issue on the ground is the educators' limited proficiency in processing this information—many struggle to discern meaningful patterns or translate numerical data into concrete classroom actions.

This capacity deficit is especially pronounced in rural educational institutions such as SD Inpres 3/77 Kanco in Bone Regency. Initial field observations and dialogues with the teaching staff revealed a strong reliance on subjective intuition rather than empirical evidence when designing remedial and enrichment activities. The educators face significant technical barriers in operating basic analytical software like Microsoft Excel to perform fundamental tasks—such as calculating central tendencies or understanding score dispersion. The situation is further complicated by the scarcity of professional development opportunities focused on educational data processing in remote areas.

To bridge this gap, the current community service project introduces a structured intervention: a statistical literacy and mentoring program utilizing Participatory Action Research (PAR) (Iqbal & Larasia, 2025). What sets this initiative apart is its practical integration of basic statistical concepts with actual student grading data from the partner school. By leveraging offline-capable software like Microsoft Excel, the program bypasses the need for high-speed internet while actively cultivating a data-driven mindset among the teaching staff. The core objectives are clear: to deepen the teachers' conceptual understanding of educational statistics, to sharpen their technical data processing skills, and to foster a sustainable habit of utilizing empirical evidence to shape responsive instructional planning (Lee et al., 2024)

METHOD

This community empowerment activity was driven by a Participatory Action Research (PAR) framework (Khafsoh & Riani, 2024). Unlike traditional top-down training models, PAR positions the participating educators as active, collaborative partners who critically reflect on and solve the practical dilemmas they face in their daily teaching environments. The initiative took place at SD Inpres 3/77

Kanco, situated in Kanco Village, Bone Regency, South Sulawesi, and actively engaged a cohort of 10 school teachers.

The execution of the program was systematically organized into a six-stage PAR cycle (Giosa et al., 2025). The process commenced with a Collaborative Needs Assessment, where the team identified the specific data utilization challenges faced by the staff. This was followed by Joint Planning to tailor the training curriculum to these exact needs without disrupting the academic calendar. The third phase, Program Implementation, involved interactive workshops bridging theoretical statistics with practical classroom scenarios. Subsequently, Continuous Mentoring and Reflection sessions were held to evaluate progress and refine the training delivery based on participant feedback. The fifth stage focused on Application in Learning Contexts, guiding teachers as they implemented data analysis in their actual grading and lesson planning. Finally, the Dissemination of Results phase ensured that the project's findings were shared with the wider educational community.

To assess the program's efficacy, data were systematically gathered using pre-test and post-test instruments, alongside participatory observation checklists and reflective interviews (Hanafiah et al., 2026). The analytical approach blended quantitative and qualitative techniques. Quantitative methods were applied to calculate mean score shifts and individual performance increments. At the same time, qualitative data reduction techniques were utilized to thematicize the cognitive, psychomotor, and institutional impacts derived from the observations and dialogues.

RESULTS AND DISCUSSION

RESULTS

The structured statistical literacy workshops at SD Inpres 3/77 Kanco progressed seamlessly according to the planned PAR trajectory. The cohort of 10 teachers demonstrated consistent engagement from the introductory needs assessment through the final mentoring phases. The curriculum specifically targeted highly practical skills, encompassing the calculation of central tendencies (mean, median, mode), understanding data dispersion, constructing frequency distribution tables, and generating visual data representations via Microsoft Excel.

To objectively measure the cognitive advancements of the participants, diagnostic tests were administered prior to and following the training interventions. The comparative results of these assessments are detailed in Table 1.

Table 1. *Pre-test and Post-test Results of Statistical Literacy Training for SDI 3/77 Kanco Teachers*

Group	Pre-test	Post-test	Score Difference
Participant 1	80	87	+7
Participant 2	80	93	+13
Participant 3	87	80	-7
Participant 4	73	80	+7
Participant 5	87	93	+6
Participant 6	93	93	0
Participant 7	73	93	+20
Participant 8	80	67	-13
Participant 9	60	67	+7
Participant 10	60	80	+20
Average	**77.3**	**83.3**	**+6.0**

The aggregated data from Table 1 illustrates a positive shift in the participants' statistical comprehension, with the collective average score climbing from an initial 77.3 to a post-intervention 83.3. A deeper look into the individual metrics reveals that 70% of the cohort successfully improved their test scores. The most dramatic improvements were observed in Participants 7 and 10, both of whom achieved a remarkable 20-point increase, highlighting the program's effectiveness in supporting educators who started with a lower baseline of statistical knowledge. Two participants experienced a decrease in post-test scores, a variance largely attributed to non-academic factors such as physical fatigue toward the end of the sessions or a mismatch in preferred individual learning styles during specific technical modules.

DISCUSSION

Strategies for Developing Educational Data Analysis Skills

The successful enhancement of statistical competencies at SD Inpres 3/77 Kanco can be heavily attributed to the strategic use of Microsoft Excel as an accessible technological bridge. This aligns with Creswell and Creswell's (2017) assertions regarding the necessity of measurable metrics in crafting precise educational interventions. By employing targeted, step-by-step guidance, the facilitators successfully dismantled the initial statistics anxiety that many participants exhibited at the onset of the program.

A pivotal element of this success was the emphasis on social interdependence (Johnson & Johnson, 2019). During group discussions and paired hands-on exercises, teachers actively exchanged insights on navigating spreadsheet formulas like AVERAGE, MEDIAN, and COUNTIF. This collaborative environment sparked a fundamental paradigm shift: numerical data transitioned from being perceived as a tedious administrative chore to being valued as a vital navigational tool for designing adaptive learning strategies.

The Impact of Data Utilization on Decision-Making

The comprehensive benefits of this initiative manifested across several distinct dimensions:

Cognitive Aspect: The educators significantly broadened their grasp of foundational statistical concepts, enabling them to process, analyze, and interpret learning outcomes confidently. They discovered how to extract meaningful narratives from raw data to gauge the efficacy of their pedagogical approaches.

Institutional Aspect: The intervention catalyzed the emergence of an evidence-based work culture. School-level decisions, particularly those concerning resource distribution and the scheduling of specific remedial or accelerated programs, are now systematically anchored in empirical assessment data rather than subjective guesswork. This newfound transparency also holds the potential to enrich communication with external stakeholders, such as parents.

Psychomotor Aspect: The teachers acquired the technical dexterity to formulate targeted data collection instruments, including refined observation

sheets and assessment rubrics. They became proficient at converting analyzed data into actionable, differentiated lesson plans.

Infrastructure Aspect: The project familiarized the school with secure data management practices, encouraging the utilization of localized storage solutions and interactive educational platforms to ensure that student data remains well-organized and readily accessible for future longitudinal evaluations.

CONCLUSION

The implementation of targeted statistical literacy training has proven to be a highly effective mechanism for elevating the professional capabilities of educators at SD Inpres 3/77 Kanco. The initiative successfully delivered measurable cognitive improvements, evidenced by the notable increase in the cohort's average test scores from 77.3 to 83.3. More importantly, the program facilitated a critical institutional transition, equipping teachers with practical data processing skills in Microsoft Excel and fostering a school-wide commitment to data-driven decision-making. Building upon these positive outcomes, it is highly recommended that the institution formally integrate periodic, data-focused review sessions into its mid-semester evaluations. Future community service endeavors should aim to expand on this foundation by introducing automated digital assessment tools linked directly to accessible spreadsheets, further streamlining the evaluation workflow.

BIBLIOGRAPHY

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage Publications.

Dolmans, D. H. J. M., De Grave, W., Wolfhagen, I. H. A. P., & Van Der Vleuten, C. P. M. (2005). Problem-based learning: future challenges for educational practice and research. *Medical Education*, 39(7), 732–741. doi:10.1111/j.1365-2929.2005.02205.x

Engel, J. (2020). Statistics anxiety and its impact on teaching and learning: A review of the literature. *Statistics Education Research Journal*, 19(2), 87–99.

Giosa, J., Evans, C., Cardozo, V., & Holyoke, P. (2025). Developing and applying the 'Participatory Research to Action Framework' for meaningful

engagement of experts-by-experience in applied health services research: a case study approach. Research Involvement and Engagement, 12, 7–7. https://doi.org/10.1186/s40900-025-00824-x

Iqbal, M., & Larasia, P. (2025). Implementation of the Tahsin Al-Qur'an Program Using the Talaqqi Method for the Community of Nagari Durian Tinggi, Kapur IX District, Lima Puluh Kota Regency, West Sumatra. Al-arkhabiil Jurnal Pengabdian Masyarakat, 5, 22–34. https://doi.org/10.51590/jpm_assunnah.v5i1.660

Khafsoh, N. A., & Riani, N. (2024). Implementation of Participatory Action Research (PAR) In Community Service Program. Jurnal Pengabdian Masyarakat, 5, 237–253. https://doi.org/10.32815/jpm.v5i1.2034

Lee, J., Alonzo, D., Beswick, K., Abril, J. M. V., Chew, A. W., & Oo, C. Z. (2024). Dimensions of teachers' data literacy: A systematic review of literature from 1990 to 2021. Educational Assessment, Evaluation and Accountability, 36, 145–200. https://doi.org/10.1007/s11092-024-09435-8

Muerza, V., Gargallo, P., Salvador, M., & Turón, A. (2024). Impact of problem-based learning on the perception, understanding, and application of statistical concepts in business administration and management students. *Sustainability*, 16(4), 1591. https://doi.org/10.3390/su16041591

Garfield, J., & Ben-Zvi, D. (2018). Research on the teaching and learning of statistics. In L. A. Steen (Ed.), *Heeding the call for change: Suggestions for curricular action* (pp. 53–74). American Mathematical Society.

Hanafiah, H., Hasan, S., Sukmayadi, D., Hajar, H. M., & Rokhilawati, Y. (2026). Strengthening School Financial Management Capacity through Participatory Training for Administrative Staff in Underfunded Secondary Schools. International Journal of Community Service (IJCS), 5, 673–689. https://doi.org/10.55299/ijcs.v5i2.2059

Harel, G., & Sowder, L. (2017). Toward comprehensive perspectives on the learning and teaching of proof. In J. Cai (Ed.), *Compendium for research in mathematics education* (pp. 233–256). National Council of Teachers of Mathematics.

Johnson, D. W., & Johnson, R. T. (2019). Social interdependence theory and cooperative learning: The teacher's role. In S. A. Karabenick & M. J. Lawson

(Eds.), *Decade of behavior* (pp. 199–220). American Psychological Association.