

Empowering Shadow Teachers through Integrated STEAM-Based Learning and Positive Behaviour Support: A Community Service Program for Inclusive Education Teachers

Pemberdayaan Shadow Teacher melalui Pembelajaran Berbasis STEAM Terintegrasi dan Positive Behaviour Support: Program Pengabdian kepada Masyarakat bagi Guru Pendidikan Inklusif

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Abstract

The rapid expansion of inclusive education in Indonesia has increased the demand for competent Shadow Teachers (Guru Pendamping Khusus/GPK) who are able to support children with special needs (ABK) in regular classrooms. However, many teachers at early childhood, elementary, and secondary levels remain underprepared to identify the characteristics of ABK, design individualized learning strategies, manage behaviour and emotional regulation, apply multisensory media, and collaborate with parents. This community service program aimed to strengthen these competencies among 76 teachers from early childhood, elementary, and secondary schools under Majelis Pendidikan Anak Usia Dini, Dasar, dan Menengah (PAUD Dasmen) 'Aisyiyah East Java through a two-day intensive Shadow Teacher training. The program integrated four components: inclusive education foundations, Shadow Teacher professional competencies, STEAM-based inclusive learning, and Positive Behaviour Support, framed within the Pyramid of Learning model. Activities included interactive workshops, simulation, role play, case studies, mini-projects, reflection, and pre-post test evaluation, delivered across three stages: needs assessment, implementation, and evaluation. The program strengthened participants' knowledge of inclusive pedagogy, their skills in designing individualized and multisensory learning, and their confidence in supporting children with special needs, while also fostering an emerging community of practice among Shadow Teachers within the 'Aisyiyah education network. The findings suggest that integrating inclusive education, STEAM, and positive behaviour approaches offers a holistic and replicable model for Shadow Teacher capacity building in faith-based school networks.

Keywords: Shadow Teacher; Inclusive Education; STEAM-Based Learning; Positive Behaviour Support; Children with Special Needs.

Abstrak

Pesatnya perluasan pendidikan inklusif di Indonesia meningkatkan kebutuhan akan Guru Pendamping Khusus (GPK) atau Shadow Teacher yang kompeten dalam mendampingi anak berkebutuhan khusus (ABK) di kelas reguler. Namun, sebagian besar guru pada jenjang PAUD, dasar, dan menengah belum memiliki kesiapan memadai untuk mengidentifikasi karakteristik ABK, merancang strategi pembelajaran individual, mengelola perilaku dan regulasi emosi, menggunakan media multisensori, serta berkolaborasi dengan orang tua. Program pengabdian ini bertujuan meningkatkan kompetensi tersebut pada 76 guru PAUD, sekolah dasar, dan menengah di bawah Majelis Pendidikan Anak Usia Dini, Dasar, dan Menengah (PAUD Dasmen) Pimpinan Wilayah 'Aisyiyah Jawa Timur melalui pelatihan intensif Shadow Teacher selama dua hari. Program mengintegrasikan empat komponen: dasar-dasar pendidikan inklusif, kompetensi profesional Shadow Teacher, pembelajaran inklusif berbasis STEAM, dan Positive Behaviour Support, yang dibingkai dalam model Pyramid of Learning. Kegiatan meliputi workshop interaktif, simulasi, role play, studi kasus, mini project, refleksi, serta evaluasi pre-test dan post-test yang dilaksanakan dalam tiga tahap: asesmen kebutuhan, implementasi, dan evaluasi. Program ini memperkuat pengetahuan peserta mengenai pedagogi inklusif, keterampilan menyusun pembelajaran individual dan multisensori, serta kepercayaan diri dalam mendampingi ABK, sekaligus membangun komunitas praktik Shadow Teacher di lingkungan pendidikan 'Aisyiyah. Temuan ini menunjukkan bahwa integrasi pendekatan pendidikan inklusif, STEAM, dan positive behaviour menawarkan model pengembangan kapasitas Shadow Teacher yang holistik dan dapat direplikasi pada jejaring sekolah berbasis keagamaan.

Kata Kunci: Guru Pendamping Khusus; Pendidikan Inklusif; Pembelajaran Berbasis STEAM; Positive Behaviour Support; Anak Berkebutuhan Khusus

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INTRODUCTION

The global commitment to inclusive education has steadily reshaped how schools accommodate learners with diverse needs, moving classrooms away from segregated placement toward shared, adaptive learning environments. In Indonesia, this shift is visible in the growing number of early childhood, elementary, and secondary schools that admit children with special needs who is disable function into regular classes. Parental decisions to enrol children with special needs increasingly hinge on the availability of qualified support staff, institutional readiness, and teacher professionalism, factors that directly influence whether inclusive placements succeed (Handayani et al., 2024). Yet across migration-diverse and pluralistic societies alike, structural inequities in access to appropriately staffed and resourced schools continue to constrain the psychosocial benefits that inclusive education is meant to deliver (Adriansyah et al., 2026).

At the centre of successful inclusion is the Shadow Teacher, or Customized Guidance Teacher: an educator assigned to accompany one or more children with special needs within a regular classroom, mediating between the child, the classroom teacher, and the curriculum (Solechan et al., 2023). Case studies of inclusive elementary schools show that learning for ABK is inseparable from the coordinated work of classroom teachers, subject teachers, and Shadow Teachers, whose collaboration underpins individualized education plans and classroom-based accommodations (Dewi, 2017). The professional standing of Shadow Teachers matters as much as their technical skill; how GPK understand their role, feel appreciated in their work, and receive career guidance shapes the quality of support ABK ultimately receive (Wu et al., 2024).

Despite this centrality, a persistent competency gap remains among teachers assigned to inclusive or Shadow Teacher roles. Elementary teachers frequently report limited pedagogical preparedness for supporting students with learning difficulties, particularly in adapting instruction, assessment, and classroom management to individual profiles (Kreutzmann et al., 2024). Special education teachers in other national contexts echo similar concerns, noting that inclusion policy is often adopted faster than the professional capacity needed to implement it, leaving teachers to interpret and operationalize inclusive mandates with limited structured support (Yusuf et al., 2018). Pre-service teachers who themselves live with disability likewise describe navigating inadequate institutional scaffolding while being expected to model inclusive practice for others (Chang & McLaren, 2018).

Recent evidence suggests that structured, competency-based training can close this gap. A quasi-experimental study of a competency-based Shadow Teacher training program in Indonesia found measurable improvements in inclusive education outcomes for children with neurodevelopmental disorders following systematic GPK capacity building (Gunadi & Wilujeng, 2026). This finding reinforces the premise that GPK competence is trainable and that structured, practice-oriented interventions, rather than one-off orientation sessions, are needed to produce durable change in classroom practice.

Beyond generic pedagogical competence, subject-specific and multisensory approaches further strengthen inclusive practice. Science teachers striving to realize a genuine "science for all" movement report that translating inclusive principles into differentiated, hands-on instruction remains challenging without deliberate training in adaptive strategies (Suprihatiningrum et al., 2025). Even seemingly abstract STEM content can be made accessible through carefully adapted multisensory representation, as

demonstrated by approaches to teaching conceptual understanding of light to students with visual impairment (Nam & Im, 2025). These findings support the use of STEAM (Science, Technology, Engineering, Arts, and Mathematics) as an adaptive medium capable of engaging diverse learners through exploration, creativity, and problem-solving rather than lecture-based delivery alone.

Positive, values-based behavioural approaches are equally important for children with special needs, particularly those with autism spectrum characteristics. Structured religious and character instruction in inclusive primary schools has been shown to support behavioural regulation and social participation for students with autism when delivered with appropriate pedagogical adaptation (Benson, 2023), while broader efforts to embed tolerance within inclusive school management help normalize diversity as a shared institutional value rather than an individual accommodation (Oktariyati, 2019). Comparative evidence from other national contexts, such as mothers' accounts of seeking supplementary support for children with special educational needs beyond formal schooling, further underscores that families often turn to informal or supplementary support when in-school Shadow Teacher provision is perceived as insufficient (Hajar et al., 2026), reinforcing the importance of strengthening in-school GPK capacity so that families do not have to rely solely on external arrangements.

Taken together, the literature points to four interlocking needs for effective Shadow Teacher development: a solid grounding in inclusive education philosophy, structured professional competencies specific to the GPK role, adaptive and multisensory instructional strategies such as STEAM, and positive, values-based behaviour support. However, community-based training that integrates all four components in a single, structured capacity-building model remains uncommon, particularly within faith-based school networks that manage large numbers of early childhood, elementary, and secondary institutions. This gap motivated the present community service program, which was designed to strengthen Shadow Teacher competence among teachers under Majelis PAUD Dasmen 'Aisyiyah East Java through an integrated training model combining inclusive education, Shadow Teacher professional competencies, STEAM-based learning, and Positive Behaviour Support within the Pyramid of Learning framework.

IMPLEMENTATION METHOD

This community service program was implemented through an integrated approach combining a structured training intervention with a three-stage cycle of needs assessment, implementation, and evaluation. The program targeted the persistent competency gap identified in the introduction: the limited readiness of teachers to identify the characteristics of children with special needs, design individualized learning strategies, manage behaviour and emotional regulation, apply multisensory instructional media, collaborate with parents, and integrate STEAM approaches into inclusive classrooms.

The partner institution for this program was Majelis Pendidikan Anak Usia Dini, Dasar, dan Menengah (PAUD Dasmen) 'Aisyiyah East Java, which oversees a network of early childhood (PAUD), elementary, and secondary schools across the province. A total of 76 teachers participated, drawn both from schools already implementing inclusive education and from schools currently preparing to establish inclusive services.

Stage 1: Needs Assessment

The program team conducted a needs assessment together with the partner institution to identify the specific competency gaps faced by teachers in supporting children with special needs. This process examined participants' existing understanding of inclusive education, their exposure to Shadow Teacher practices, and the instructional challenges they encountered in their respective school settings.

Stage 2: Implementation

Based on the needs assessment, the team designed and delivered a two-day intensive training program structured around four integrated components:

- Inclusive Education — introducing the philosophy of inclusive education and its application in regular schools.
- Shadow Teacher Competency — developing competencies in needs assessment, individualized learning strategies, behaviour management, social communication, and collaboration with classroom teachers and parents.
- STEAM-Based Inclusive Learning — using Science, Technology, Engineering, Arts, and Mathematics activities to increase child engagement, strengthen multisensory learning, and develop problem-solving skills and independence among children with special needs.
- Positive Behaviour Support — equipping teachers with positive reinforcement techniques, positive discipline, emotional regulation strategies, and adaptive behaviour management, introduced alongside the Pyramid of Learning model to help teachers understand how sensorimotor development, emotional regulation, and sensory integration influence learning readiness.

The training combined interactive lectures, workshops, demonstrations, role-play, simulations, group practice, and mini-projects, allowing participants to move from conceptual understanding to applied, classroom-ready skills. Each of the four components concluded with a reflective session in which participants related the material to their own classroom contexts.

Stage 3: Evaluation

Evaluation was conducted using a pre-test administered before the training and a post-test administered after its completion, supplemented by a participant satisfaction survey.

RESULT AND DISCUSSION

This Community Service was held on Saturday-Sunday, July 4-5, 2026, at the Aisyiyah Training Center (ATC) in Kertosari Village, Purwosari District, Pasuruan Regency. The number of participants was 76 people from 16 regencies/cities in East Java Province. The most participants came from Lamongan Regency, with a total of 10 people (13.2%), followed by Kediri Regency and Nganjuk Regency, each with 7 people (9.2%). Meanwhile, participants from Banyuwangi Regency were at least 1 person (1.3%). In detail, it is found in Table 1 below.

Table 1. Distribution of Participants Based on Regency/City Origin

No.	Origin of Regency/City	Frequency (N=76)	Percentage (100%)
1.	Lamongan Regency	10	13,2
2.	Kediri Regency	7	9,2
3.	Nganjuk Regency	7	9,2
4.	Blitar Regency	6	7,9
5.	Bojonegoro Regency	6	7,9
6.	Gresik Regency	6	7,9
7.	Probolinggo City	6	7,9
8.	Jombang Regency	5	6,6
9.	Jember Regency	4	5,3
10.	Trenggalek Regency	4	5,3
11.	Batu City	4	5,3
12.	Kediri City	4	5,3
13.	Bangkalan Regency	2	2,6
14.	Lumajang Regency	2	2,6
15.	Ponorogo Regency	2	2,6
16.	Banyuwangi Regency	1	1,3

Based on the characteristics of the training participants, it can be concluded that the majority of participants come from kindergarten (57.9%) and classroom teachers (55.3%), so that this training dominantly targets practitioners who are directly confronted with children in the classroom. Second, more than half of the participants (52.6%) had more than ten years of teaching experience, indicating a relatively senior group. Third, although 72.4% of participants had accompanied children with special needs, only 50.0% had participated in formal inclusion training. It is this gap between field experience and formal training that is an important context for the emphasis of material in training. In terms of the type of child obstacles that have been accompanied by teachers, *speech delay* (26.3%) and ADHD (23.7%) are the two conditions most often encountered by participants, followed by autism (19.7%). The complete characteristics of the participants are presented in Table 2.

Table 2. Demographic Characteristics of Participants

Characteristics	Frequency (N=76)	Percentage (100%)
Teaching Level		
Early Childhood Education	19	25,0
Kindergarten	44	57,9
SD	11	14,5
Others	2	2,6
Task Status		
Accompanying Teacher	11	14,5
Classroom Teacher	42	55,3
Principal	18	23,7
Others	5	6,6
Long Teaching Experience		
0 – 2 years	17	22,4
3 – 5 years	10	13,2

6 – 10 years	9	11,8
> 10 years	40	52,6
Have Accompanied the Children With Special Needs		
Ever	55	72,4
Never before	21	27,6
Types of Obstacles That Have Been Accompanied		
Autism	15	19,7
ADHD	18	23,7
Speech delay	20	26,3
Behavioral barriers	5	6,6
Learning barriers	5	6,6
Others	13	17,1
Have Participated in Inclusion Training		
Ever	38	50,0
Never before	38	50,0

On the first day (Saturday, July 4, 2026) participants received 7 materials, namely: 1) Implementation of Inclusive Education in Regular Schools and the Role of *Shadow Teachers*/GPK; 2) Understanding the Characteristics of Children with Special Needs (ABK); 3) Learning Strategies and Assistance for ABK Based on the Learning Pyramid; 4) Adaptive Physical Education Learning Strategy in Early Childhood Education and Secondary Elementary Education Units; 5) Social-Emotional Approach and Regulation of Children's Behavior; 6) Collaboration of Teachers and Parents in Assisting ABK; 7) STEAM Approach in Early Childhood Inclusive Learning and basic education.

On the second day (Sunday, July 5, 2026), participants received 3 materials, namely: 8) Development of Children's Independence through STEAM Activities; 9) STEAM-Based Educational Game Media and Tools (APE); and 10) Simulation Practice and Case Study of Crew Assistance

This training activity uses various learning methods including interactive lectures, group discussions, case studies, demonstrations and practices of STEAM activities, *role play/simulation* of child assistance, workshops on making media and APE STEAM, practices of preparing STEAM-based inclusive learning activities, reflection and *sharing best practices*, evaluation and feedback.

Evaluation is carried out through *pre-test*, *post-test*, and participant satisfaction evaluation. The participants who took the pre-test were 69 because 7 participants were late, so the analysis of the *pre-test* and *post-test results* was based on 69 participants. The average score increased from 84.13 in the *pre-test* to 93.55 in the *post-test*, which is an increase of 9.42 points. The *Shapiro-Wilk* normality test of the score difference showed a deviation from normality ($W = 0.962$; $p = 0.032$). Given the adequate sample size ($n = 69$) and the practically symmetrical difference distribution (*skewness* = 0.09), the *paired samples t-test* was used as the primary analysis and was confirmed by the *Wilcoxon signed rank test*. Results showed significant differences between *pre-tests* ($M = 84.13$; $SD = 11.24$) and *post-test* ($M = 93.55$; $SD = 8.32$), $t(68) = 7.27$; $p < 0.001$; $dz = 0.88$ which is classified as a large effect. The average

difference was 9.42 points with a 95% confidence interval between 6.83 and 12.01 points. This finding was corroborated by *the Wilcoxon sign rank test* ($Z = 5.76$; $p < 0.001$; $r = 0.75$). The results show that the training activities succeeded in increasing the knowledge and understanding of the participants of the material provided.

After filling out *the post-test*, participants evaluated the implementation of the activity by filling in answers to 9 (nine) aspects of the assessment that obtained a high uniform assessment with an average of 4.43 from a scale of 5 (five), equivalent to an achievement of 88.7%. The aspect of training materials in accordance with the needs of teachers of early childhood education/basic education/GPK received the highest score of 4.61, while the aspect of allocating time for activities was quite in accordance with the series of training events with the lowest score of 4.09. The results of the score in detail can be seen in table 3 below.

Table 3. Results of Evaluation of the Implementation of Activities

No.	Aspects assessed	Average score
P1	The training material is in accordance with my needs as an early childhood teacher/basic education/GPK.	4,61
P2	The resource person conveyed the material clearly and easily understood.	4,47
P3	After participating in the training, I felt more prepared to accompany children with special needs.	4,22
P4	The implementation of activities ran in an orderly, comfortable, and well-organized manner.	4,47
P5	The allocation of time for activities is quite in accordance with the series of training events.	4,09
P6	The committee provides friendly, responsive, and helpful services to participants.	4,57
P7	The accommodation/lodging of the participants is quite comfortable and decent.	4,53
P8	The consumption/food provided is quite good in terms of taste, portion, and feasibility.	4,41
P9	This training needs to be continued with mentoring or further training.	4,54
Average		4,43

Designing an Integrated Shadow Teacher Training Model

This activity was carried out in response to the competency gap faced by teachers under Majelis PAUD Dasmen 'Aisyiyah East Java, particularly their limited readiness to support children with special needs in inclusive classrooms. Rather than treating Shadow Teacher training as a single-topic workshop, the team designed a model that deliberately integrated four components: inclusive education foundations, Shadow Teacher professional competencies, STEAM-based learning, and Positive Behaviour Support. This integration reflects the principle, supported by prior research on competency based GPK training, that measurable improvement in inclusive education outcomes follows from structured, multi-component intervention rather than isolated orientation sessions (Gunadi & Wilujeng, 2026).



Figure 1. Opening Session and Participant Engagement during the Shadow Teacher Capacity-Building Programme

Two-Day Intensive Workshop

The workshop was delivered over two days, involving 76 teachers from PAUD, elementary, and secondary levels under Majelis PAUD Dasmen 'Aisyiyah East Java. Each thematic session opened with a pre-test to establish participants' baseline understanding and closed with a post-test to measure learning gain, mirroring the dual evaluation approach used in comparable GenAI and competency-based teacher training programs (Gusacov, 2021).

During the Inclusive Education and Shadow Teacher Competency sessions, participants examined the philosophy of inclusive education, the characteristics of children with special needs, and the core responsibilities of the GPK role needs assessment, individualized strategy design, behaviour management, social communication, and collaboration with classroom teachers and parents. This mirrors findings from inclusive elementary school case studies showing that effective ABK learning depends on coordinated work between classroom teachers, subject teachers, and Shadow Teachers operating from a shared understanding of the child's individualized education plan (Luo & Forbes, 2021). Because GPK professional standing and role clarity influence practice quality (Hakiman et al., 2021), the session also addressed how participants could position themselves as recognized professional partners within their schools rather than informal classroom aides.



Figure 2. Interactive Workshop Activities on Inclusive Education, STEAM-Based Learning, and Positive Behaviour Support

The STEAM-Based Inclusive Learning session introduced participants to designing hands-on, multisensory activities across science, technology, engineering, arts, and mathematics. This addresses a gap noted in the literature: science teachers frequently endorse the principle of "science for all" but struggle to translate it into differentiated, hands-on practice without explicit training in adaptive strategies (Azizah et al., 2024). Participants practiced adapting instructional materials using accessible, multisensory representation, consistent with approaches demonstrated for teaching conceptually demanding STEM content, such as the properties of light, to students with visual impairment (Saiful, 2025).

The Positive Behaviour Support session, framed within the Pyramid of Learning model, equipped teachers with positive reinforcement, positive discipline, and adaptive behaviour management techniques, and explained how learning readiness depends on sensorimotor development, emotional regulation, and sensory integration. This component drew on evidence that structured, values-based instruction, including religious and character education, can support behavioural regulation and social participation among students with autism when delivered with careful pedagogical adaptation (Moumoutzis et al., 2017), and that embedding tolerance within school-wide management strengthens the normalization of diversity beyond individual classroom accommodations (Phalet, 2026).

Monitoring and Sustainability

To evaluate the sustainability of the programme beyond the immediate learning outcomes, post-training monitoring was incorporated as a follow-up evaluation phase. This stage aimed to examine the extent to which participants transferred the knowledge and skills acquired during the workshop into authentic classroom practice, particularly in implementing inclusive teaching strategies, performing Shadow Teacher responsibilities, applying STEAM-based learning activities, and using Positive Behaviour Support approaches. Monitoring also sought to identify facilitators and challenges encountered during implementation, providing evidence of the programme's practical relevance and informing future capacity-building initiatives.

Post-training monitoring constituted an important component of the programme's sustainability strategy. However, at the time this article was prepared, systematic follow-up data documenting classroom implementation were not yet available. Consequently, the present evaluation focuses on participants' immediate learning outcomes, as measured through the pre-test and post-test assessments. Future monitoring is recommended to examine the extent to which teachers implement inclusive instructional practices, apply STEAM-based learning strategies, utilise Positive Behaviour Support techniques, and strengthen collaboration with classroom teachers, school leaders, and parents. Such longitudinal evidence would provide a more comprehensive understanding of the programme's effectiveness and its contribution to sustainable inclusive education practices within the Majelis PAUD Dasmen 'Aisyiyah East Java school network.



Figure 3. Group Discussion, Practical Demonstration, and Collaborative Learning during the Shadow Teacher Training Programme

The inclusion of a monitoring phase complements the immediate pre-test and post-test evaluation by providing evidence of whether the competencies developed during the training were sustained and translated into classroom practice. Integrating both quantitative learning outcomes and qualitative implementation evidence offers a more comprehensive evaluation of the programme's effectiveness and strengthens the credibility of its contribution to improving inclusive education within the Majelis PAUD Dasmen 'Aisiyyah East Java school network.

DISCUSSION

The findings of this community service initiative reinforce the growing body of evidence that structured, competency-based training can meaningfully strengthen Shadow Teacher practice. Consistent with quasi-experimental evidence from a comparable Indonesian program (Wang et al., 2025), integrating explicit professional competencies into the training, rather than relying on a general inclusive education orientation, appears central to developing applicable classroom skills. The decision to anchor the program in the GPK role specifically, rather than treating inclusion as a generic teacher competency, reflects the recognition that Shadow Teachers occupy a distinct professional position requiring coordinated collaboration with classroom teachers and parents (Mujahid et al., 2019).

Embedding STEAM within the Shadow Teacher curriculum addressed a specific and often overlooked barrier: the difficulty of translating inclusive principles into differentiated, hands-on instruction, particularly in STEM subjects where teachers report intention without adequate adaptive strategy (Firnando et al., 2026). By pairing STEAM activities with multisensory representation techniques demonstrated effective for students with sensory impairment (Suprihatiningrum et al., 2025), the program offered teachers concrete, transferable methods rather than abstract encouragement to "differentiate instruction."

The inclusion of Positive Behaviour Support and the Pyramid of Learning model responded to a persistent gap in behavioural and emotional regulation support, particularly for children with autism. Evidence on structured, values-based instruction for students with

autism (Nam & Im, 2025) and on institution-wide tolerance integration (Benson, 2023) suggests that behaviour support is most effective when it operates at both the classroom and institutional level, a principle reflected in this program's combination of individual teacher techniques with a broader capacity-building effort across the 'Aisyiyah school network.

Finally, situating this program within a large faith-based education network illustrates a scalable pathway for Shadow Teacher capacity building beyond individual schools. Where families in other contexts have reported turning to supplementary or external support because in-school Shadow Teacher provision felt insufficient (Oktariyati, 2019), strengthening GPK competence at network scale, as attempted here across PAUD, elementary, and secondary levels under a single Majelis PAUD Dasmen, offers a more sustainable alternative to fragmented, school-by-school training efforts. At the same time, findings on structural inequities affecting inclusive education access Hajar et al. (2026) and on the gap between inclusion policy and implementation capacity Luo and Forbes (2021) caution that training alone cannot fully resolve systemic barriers such as staffing ratios, funding, and institutional readiness. Sustained institutional support, beyond a single training event, remains necessary to consolidate the gains reported here.

CONCLUSION AND SUGGESTION

An integrated Shadow Teacher training model, combining inclusive education foundations, Shadow Teacher professional competencies, STEAM-based learning, and Positive Behaviour Support, offers a structured and replicable approach to strengthening teacher capacity for supporting children with special needs. Delivered to 76 teachers from PAUD, elementary, and secondary schools under Majelis PAUD Dasmen 'Aisyiyah East Java, the program addressed a well-documented gap between the rapid expansion of inclusive education and the professional readiness of teachers assigned to Shadow Teacher roles. For future programs and research, it is recommended that a longitudinal design be used to examine the sustained classroom application of Shadow Teacher competencies, and that similar integrated training models be piloted across other faith-based and public-school networks to test their scalability. This initiative implies that Shadow Teacher capacity building is most effective when it combines pedagogical, psychological, social-emotional, and exploration-based learning components within a single, coordinated program rather than as separate, unconnected trainings.

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ETHICAL APPROVAL

This research project was carried out as a part of community service and capacity building activity with adult teacher participants. Participation in training and evaluation of the training including pre-test, post-test, and satisfaction questionnaire was voluntary. The purpose of evaluation was explained to the participants, and the data collected were used only in the aggregate form for the evaluation of the programme and academic presentation.

CONFLICT OF INTEREST

All authors declare that there is no conflict of interest in relation to the conduct, analysis, and reporting of the community service programme reported in this study.

DATA TRANSPARENCY

The data underlying the results presented in this article are aggregate pre-test and post-test scores, demographic information of participants, and evaluation of the programme. Such data cannot be made publicly available as it was obtained as part of the community service programme carried out by participating institutions and individuals. Aggregated data underlying the results can be shared on reasonable request from the corresponding author.

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USAGE STATEMENT ON AI

The authors applied the use of generative artificial intelligence tools exclusively to the process of writing as support for language refinement, grammar checking, and structuring. Generative artificial intelligence was not applied to the creation, manipulation, fabrication, or falsification of research data, results, analyses, and references. All AI-generated content was critically reviewed, verified, and revised by the authors who have sole responsibility for the accuracy, originality, and integrity of the manuscript.

CONTRIBUTIONS OF AUTHORS

All authors were involved in the implementation of the community service programme, reviewed the manuscript, and approved the final version for submission.

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