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Training and Mentoring Teachers in Using the I-CIBI Application for Initial Screening of Gifted and Talented Potential Among Elementary School Students: A Pre-Post Evaluation of Teachers' Knowledge

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Abstract
Identifying children with gifted and talented potential is essential for providing educational services that meet their individual needs. However, some elementary school teachers still rely on manually administered tests that may be difficult to standardize and document. This community service program aimed to improve teachers' knowledge of the I-CIBI Application, a digital tool for preliminary screening of gifted and talented potential that requires subsequent formal assessment. Conducted on August 24-25, 2026, at Universitas Negeri Padang, the program involved 12 elementary school teachers and two students as simulation subjects. Activities included introductory sessions on gifted and talented potential, technical guidance, supervised application practice, and pre-training and post-training assessments using the same 10 multiple-choice questions. All participants completed both assessments. The mean score increased from 46.7 before training, with a standard deviation of 11.55, to 89.2 after training, with a standard deviation of 7.93. The mean individual score gain was 42.5 points, with a standard deviation of 13.57. Statistical analysis indicated a significant difference between the pre-training and post-training scores, with a t-statistic of 10.85, 11 degrees of freedom, a p-value below 0.001, and an effect size of 3.13. These findings indicate an immediate improvement in teachers' knowledge scores following the training. However, the single-group design, small sample, repeated test items, and absence of follow-up limit the interpretation of the results. The program provides an initial model for translating university research into teacher capacity development and supports educational inclusion through partnerships between higher education institutions and schools.

Keywords: community service; elementary school teachers; gifted and talented potential; I-CIBI Application; teacher training

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INTRODUCTION

Every child carries a different mix of intelligence and talent, and a small number show ability well beyond their peers', whether intellectually, creatively, or in some specific skill. In Indonesia this group is referred to as *Cerdas Istimewa dan Bakat Istimewa* (CIBI), a term that maps conceptually onto what the international literature calls giftedness. Renzulli's (2005) three-ring conception of giftedness holds that gifted behavior emerges from the interaction of three clusters of traits (above-average ability, creativity, and task commitment), which is why identifying a CIBI child should not rest on a single measure such as an intelligence test alone, but instead calls for instruments capable of capturing several dimensions of a child's potential at once.

CIBI children may have learning support needs, such as enrichment or acceleration, that differ from what a standard curriculum offers. When these needs go unrecognized, some children may experience underachievement and, in some cases, socio-emotional difficulties (Setiyatna & Melati, 2021; Sholehah & Putro, 2022); these are potential risks rather than inevitable outcomes, and not all gifted children share the same pattern of needs, which varies by individual and context. Research

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points to distinct characteristics among young CIBI children, such as early reading, strong curiosity, and a marked drive to learn (Eva, 2016). This places real demands on regular classroom teachers, who interact with these students most often and so need to be able to recognize indications of such potential early, while also recognizing common misconceptions about CIBI children, for instance the assumption that a gifted child must excel in every subject.

In practice, some elementary schools identify gifted and talented potential using teacher-administered manual tests whose standardization can vary and whose results can be difficult to keep as consistent school records; this does not mean manual identification is inherently invalid, as its reliability and traceability depend on the specific instrument and procedures used. At the partner school of this program, SD Pembangunan Laboratorium UNP, the principal reported that identification had until then relied solely on manual testing (Friati, 2026); this is a single informant's account reported in the media rather than primary baseline data collected by the authors. A similar gap shows up more broadly in the identification of children with special needs, where the lack of standardized instruments often limits how effectively teachers can screen for them (Ndoya et al., 2023).

Several community service programs have tried to address this through training on mobile-based identification tools, for example training on an Android application for identifying children with special needs in Barito Kuala (Amka & Mirnawati, 2022) and constructivist-model identification training for early-childhood teachers (Munthe et al., 2021), both of which reported gains in teacher competence after mentoring. Even so, instruments built specifically to detect CIBI children, tested directly with regular elementary school teachers and backed by measurable evidence of teacher learning, remain scarce, a gap this activity aims to help close.

The Department of Special Education (PLB) at Universitas Negeri Padang has built a research track record in gifted-child identification over more than a decade, led by Nurhastuti. The work began with a doctoral study on research-and-development models for aptitude tests capable of revealing elementary students' abilities across Sumatra and Java (Nurhastuti, 2017). This line of research was later brought together in the book *Instrumen Potensi Anak Cerdas dan Berbakat* (Nurhastuti, 2019), which became the main reference for developing the I-CIBI Application, and was followed by a needs analysis among teachers and parents regarding the application (Nurhastuti et al., 2025), which reported teachers' and parents' perceptions of the tool's usability and recommended stronger follow-up features and parental guidance; this needs analysis did not test the application's classification accuracy, reliability, or validity. This body of work complements earlier conceptual research on identifying gifted children in inclusive schools (Amka & Mirnawati, 2021).

To keep this research from ending at publication, Universitas Negeri Padang offers the Impactful Community Service Program (PPUB) as a channel for moving campus research into schools. The scheme fits with national research downstreaming policy, which pushes university research toward becoming applied technology with a direct benefit to society (Kementerian Pendidikan Tinggi, Sains, dan Teknologi, 2025). Through this scheme, the digital CIBI-identification instrument built on this research line was put directly into the hands of elementary school teachers as the I-CIBI Application. The application measures six dimensions of giftedness drawn from Marland's (1972) classic framework (general intellectual ability, specific academic aptitude, creativity, leadership, visual and performing arts, and psychomotor ability), plus one contextual dimension, Pancasila character, bringing the total to seven dimensions of CIBI potential.

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Renzulli's three-ring model and Marland's framework are not interchangeable: the three-ring model explains the psychological mechanism of giftedness (the interaction of ability, creativity, and task commitment), whereas Marland's six categories operationalize the domains in which that giftedness can be observed. The I-CIBI Application uses Marland's six domains as its primary talent indicators and adds Pancasila character as a seventh, contextual dimension reflecting national educational values; this seventh dimension functions as a complementary indicator of character and learning-outcome readiness and is not treated as evidence of giftedness itself. For the purposes of this article, CIBI potential is defined operationally as a profile on the I-CIBI Application indicating above-average potential in one or more of the six talent domains; this is an initial screening result, not a diagnosis of giftedness, and formal assessment is still required. Classification follows the application's built-in scoring algorithm, whose thresholds were set by the developers and were not independently verified or modified in this program. The Pancasila character dimension is reported as contextual information and is not used as a criterion for classifying a child as gifted or talented.

Table 1 maps the seven dimensions to their conceptual basis and role in the screening. The inclusion of the character dimension follows the instrument's original development work (Nurhastuti, 2019) rather than new psychometric validation conducted in this program. The item-level indicators and the criteria distinguishing screening categories are those defined in the original instrument (Nurhastuti, 2019) and are not reproduced or re-examined here; this article reports a teacher training program, not an evaluation of the instrument's content. The works cited above document the conceptual and developmental background of the instrument; they do not by themselves establish the performance of the specific version of the I-CIBI Application used in this program. For this training program, the I-CIBI Application is treated as an initial screening tool: its construct and content validity, reliability, decision thresholds, norms, and screening accuracy for the elementary-age group were not independently tested within this program, and its diagnostic validity should not be assumed. This program used version 8 (v8) of the I-CIBI Application, which was registered for intellectual property protection in 2024. Its source instrument was adapted from Marland's (1972) framework and developed in the team's earlier research (Nurhastuti, 2019), and the application's usability was examined in a needs analysis (Nurhastuti et al., 2025); the instrument's development, scoring, and validation are reported in those works and are not repeated here, as this article reports a training program rather than an instrument evaluation.

Table 1. Mapping of the Seven I-CIBI Dimensions to Their Conceptual Basis

No	Dimension	Conceptual basis	Relation to Renzulli's three rings	Role in I-CIBI screening
1	General intellectual ability	Marland (1972)	Above-average ability (general)	Primary talent indicator
2	Specific academic aptitude	Marland (1972)	Above-average ability (specific domain)	Primary talent indicator
3	Creativity	Marland (1972)	Creativity ring	Primary talent indicator
4	Leadership	Marland (1972)	No ring of its own; a domain in which ability is observed	Primary talent indicator
5	Visual and performing arts	Marland (1972)	A domain in which ability and creativity are observed	Primary talent indicator

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6	Psychomotor ability	Marland (1972)	A domain in which ability is observed	Primary talent indicator
7	Pancasila character	Instrument development (Nurhastuti, 2019); national education values	Not part of the three rings; task commitment has no separate dimension	Contextual information only; not evidence of giftedness and not used for classification

Teachers' mastery of a digital instrument like this cannot be separated from their readiness in technology-pedagogy skills more broadly. The technological pedagogical content knowledge (TPACK) framework holds that using technology effectively in teaching requires an integrated blend of technological, pedagogical, and content knowledge (Mishra & Koehler, 2006); in this program, the TPACK framework was used only to guide the training design, pairing technical instruction on the application with instruction on CIBI concepts, and was not treated as a construct measured in this study. To gauge teachers' declarative knowledge of the application and of CIBI concepts after training, this activity included a post-test evaluation, analyzed descriptively; this test was not a validated TPACK instrument, and no claim of improved TPACK integration is made based on its results.

Against this background, the activity aimed to: (1) strengthen the understanding of teachers at SD Pembangunan Laboratorium UNP regarding core CIBI concepts; (2) train and mentor teachers so they could operate the I-CIBI Application, with guidance, for the initial screening of CIBI potential among students in their own schools; and (3) measure teachers' post-training understanding through a post-test evaluation.

METHODS

The activity was directed at teachers of SD Pembangunan Laboratorium UNP as the main partner, with 12 teachers taking part as trainees. Two students from the same school also took part as simulation subjects, helping demonstrate how the I-CIBI Application works in practice; their role was limited to this demonstration and they were not used to test the application's screening accuracy. It ran on 24–25 August 2026 at the Senate Meeting Room, 2nd Floor, Faculty of Education (FIP), Universitas Negeri Padang, Padang City, under the Impactful Community Service Program (PPUB) scheme. The implementing team comprised four lecturers from the Department of Special Education, Faculty of Education, UNP, led by Nurhastuti with Syari Yuliana, Mardhatillah Zulpiani, and Harlina Ramelan as members.

The participating teachers comprised four class teachers of grades 4 and 5, two school counselling teachers, two physical education teachers, two religious education teachers, and two English teachers, who taught grades 4, 5, and 6; they had previously taken part in a focus group discussion on the I-CIBI Application. The two students who served as simulation subjects were high-achieving students (class top performers) in grades 4 and 5, and their parents gave permission for their participation. Because participants were drawn from a single partner school, findings on teachers' knowledge gains should not be generalized to elementary school teachers in general. Preparation stage. The team coordinated with the leadership of SD Pembangunan Laboratorium UNP to agree on scheduling, participant targets, and technical requirements, including the devices needed to run the I-CIBI Application.

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First-day implementation. Following registration and a brief opening session, the core program began with basic CIBI concepts delivered through lecture and discussion, including common misconceptions about CIBI children, Renzulli's (2005) Three-Ring theory, Gagné's (2004) talent development model, Gardner's (1983) theory of multiple intelligences, and their connection to Piaget's stages of cognitive development at elementary-school age (Piaget & Inhelder, 1969) (Session 1, presented by Harlina Ramelan, M.Pd.). This was followed by technical training on the I-CIBI Application, covering its main menu, the timer mechanism for each test item, how to enter identification data, and how to interpret the application's recommendations (Session 2, presented by Syari Yuliana, M.Pd.), and Session 3, an initial hands-on practice (presented by Dr. Nurhastuti, M.Pd. and Mardhatillah Zulpiani, M.Pd.).

Throughout, the approach was andragogical, combining live demonstration with question-and-answer so that participants, as adult learners, could connect the material to their own classroom experience. The first day ran from 08.30 to 16.00: registration and the opening program (08.30-10.00), Session 1 on core CIBI concepts (10.00-12.30, 2.5 hours), a lunch and prayer break, Session 2 on the technical use of the application (13.31-14.30, 1 hour), Session 3 with initial hands-on practice (14.31–15.30, 1 hour), and closing and documentation (15.31-16.00). The second day ran from 07.30 to 16.00 and consisted of practice sessions with the application (08.01–10.00, 10.31–12.30, and 13.31–16.00; about 6.5 hours in total) as self-directed practice in small groups with the team's guidance, interspersed with a coffee break and a lunch and prayer break.

Second-day implementation. The day focused on hands-on practice: teachers applied the I-CIBI Application with the two students serving as simulation subjects, with the team on hand to assist. Teachers worked through the identification procedure, from data collection to interpreting results. Practice was self-directed in small groups, with team members on hand to guide participants as needed; no formal performance rubric or independent assessors were used.

Evaluation stage. Success was assessed through two complementary approaches. The first was participatory observation of how teachers operated the application during the second day's guided practice, together with an interview with the principal of SD Pembangunan Laboratorium UNP about how relevant and useful the application was compared with the manual identification methods the school had been using. The second was a quantitative learning evaluation: an online pre-test given before training began and a post-test given once training had concluded.

Both used the same 10 multiple-choice items, each worth 10 points (total score 0-100). Five items assessed understanding of core CIBI concepts (misconceptions about CIBI, Renzulli's Three-Ring theory, Gagné's model, Gardner's theory of multiple intelligences, and Piaget's stages of cognitive development), while the other five assessed technical understanding of the I-CIBI Application (its main menu, the per-item timer function, its place in the identification workflow, follow-up on CIBI indications, and how to use test results). Both sets of items measured declarative and procedural knowledge only; they were not designed to, and do not, assess teachers' proficiency in performing an actual screening or interpreting real-world student cases. Both instruments were completed online and scored automatically by the form system.

All twelve participating teachers completed the pre-test and post-test fully and in a matched, paired format (a 100% response rate), with each respondent's identity linkable across the two measurements, allowing the results to be analyzed both at the group (aggregate) level and as individual paired gain scores. This evaluation followed a one-group pre-test–post-test design without a control

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group and a small sample (n = 12); the paired-sample t-test compared each teacher's post-test score against their own pre-test score (a within-subject difference), not two independent groups.

Pre-test and post-test scores were then analyzed descriptively (mean, median, standard deviation, and category distribution), tested for difference using a paired-sample t-test, and sorted into four achievement categories, Excellent (≥ 90), Good (80–89), Fair (60–79), and Poor (< 60), following commonly used criteria for categorizing learning evaluation scores (Arikunto, 2013). Assumption checks, the 95% confidence interval of the mean difference, and the basis for d_z are reported in the Results. A statistically significant result among these training participants indicates a within-group association and does not by itself demonstrate a causal training effect or generalize to other schools.

On this 10-item, 10-point-per-item test, the Excellent and Good categories distinguish only between 9–10 and 8 correct answers, respectively; these thresholds are applied as a norm-referenced convention for reporting learning-evaluation scores and are not based on an applied competency standard for screening proficiency. The 10 items were prepared by the team for this activity and were not formally validated; no reliability estimate or item-difficulty analysis was computed, which is consistent with the descriptive purpose of this activity report.

Because the pre-test and post-test used identical items, the reported gain may partly reflect testing or memory effects rather than learning alone, particularly given the small 10-item pool; this is acknowledged as a limitation of the design (see the Conclusion), and a parallel test form or a delayed post-test would be needed to assess retention independent of item familiarity.

Ethical considerations. The activity was carried out with a permission letter from the partner school. The parents of the two students who served as simulation subjects gave permission for their children's participation and for the use of photographs of the activity. The I-CIBI Application was operated and held by the participating teachers, screening results were treated as an initial indication and not as a diagnostic label, and teachers' test scores are reported under anonymized codes. Individual student identification results are not reported in this manuscript without the corresponding consent.

RESULTS AND DISCUSSION

Implementation of the Training and Mentoring

On the first day, all participants took part in the session on core CIBI concepts and technical instructions for the I-CIBI Application. Teachers engaged actively in discussion throughout, particularly around the difference between ordinary learning difficulties and the traits of CIBI children, a distinction that, in their own classroom observations, often blurs. On the second day, teachers practiced the application in small groups with the team's support and applied it to the two students serving as simulation subjects, working through the stages from entering instrument data to reading the resulting recommendations. The team observed teachers' participation during this guided simulation. Because these observations were not recorded with a systematic rubric, and the number of teachers who completed each stage independently, with assistance, or unsuccessfully was not documented, they describe participation only and do not establish independent operational mastery.

According to a news report by ANTARA (Friati, 2026), Nurhastuti, who led the team, explained that the activity grew out of a need among teachers for a practical way to identify student potential. She noted that the PPUB scheme serves as the main bridge for channeling campus research directly into schools, and that the I-CIBI Application was introduced with the intention of giving teachers a

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practical, measurable CIBI identification tool, supported by ongoing training and mentoring rather than the application simply being handed over. This account is reported as context for the activity; it is a statement of intent by the team leader and not an independent evaluation of the application's accuracy or success, which would require data such as application audit logs, competency rubrics, and systematically analyzed evaluation interviews.

In the same report (Friati, 2026), Yasmadewi, S.Pd., principal of SD Pembangunan Laboratorium UNP, said the school had until now relied solely on manual testing to identify students with gifted and talented potential, and that the I-CIBI Application was a welcome addition because identification results can be saved and printed immediately, making it easier to keep student records for the school's archives. This is the perception of a single informant, reported by an external news source; it does not show that the process is more accurate, faster, or more efficient than manual identification, which would require before-and-after indicators such as time, error rates, cost, or documentation quality. The principal also conveyed these views in the team's own interview described in the Methods; both accounts come from the same informant.

The first day opened with a session attended by the team, the school's leadership, and all participating teachers (Figure 1), during which the team gave a short briefing and overview of the program before moving into the core material (Figure 2).



Figure 1. The opening session of the I-CIBI Application training and mentoring activity



Figure 2. The team presenting a briefing and program overview

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During the first day's sessions, participants followed the presenters' material and occasionally raised questions and comments (Figure 3). The content covered theories of children's cognitive development as a foundation for understanding how students learn (Figure 4), along with the traits of gifted and talented children that teachers need to recognize early on (Figure 5). Toward the end of the session, the presenters also demonstrated the I-CIBI Application's main menu to prepare participants for the following day's practice (Figure 6).



Figure 3. Participants following the training material



Figure 4. A presenter discussing theories of children's cognitive development



Figure 5. A presenter discussing the traits of gifted and talented children

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Figure 6. A presenter demonstrating the I-CIBI Application's main menu

On the second day, teachers practiced using the I-CIBI Application in small groups with the team's support (Figure 7), then applied it directly with the students serving as simulation subjects (Figure 8). The activity closed with a group photo of the team, teachers, and participating students (Figure 9).



Figure 7. Teachers discussing and practicing with the I-CIBI Application in groups



Figure 8. Teachers applying the I-CIBI Application with a student simulation subject

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Figure 9. Group photo of the team, teachers, and student participants

Teachers' Pre-Test and Post-Test Achievement

The initial quantitative evaluation showed that among the 12 teachers who completed the pre-test before training, the mean score was 46.7 (median = 50; SD = 11.55), with scores ranging from 30 to 60. Because the test has only 10 items, scores move in 10-point steps. All 12 participating teachers completed both tests. The pre-test was administered at the start of the first day (24 August 2026), before the first session, and the post-test after the guided practice on the second day (25 August 2026), so the interval between the two tests spanned the two training days. Both tests were completed online using Google Forms. Table 2 presents the distribution of scores by achievement category.

Table 2. Distribution of Teachers' Pre-Test Score Categories (N = 12)

Category	Score Range	f	%
Excellent	≥ 90	0	0.0
Good	80–89	0	0.0
Fair	60–79	3	25.0
Poor	< 60	9	75.0
Total	–	12	100

None of the teachers fell into the Excellent or Good categories on the pre-test; most (75.0%) fell into Poor and only 25.0% into Fair, indicating low baseline scores. Because the test combines conceptual items with items on the application's menus and procedures, which may have been new to the teachers, these low scores may partly reflect unfamiliarity with this specific application rather than a general weakness in understanding CIBI concepts. The category thresholds are descriptive labels applied to a 10-item knowledge test and are not tied to a competency standard.

Once the training was complete, the same 12 teachers sat the post-test, this time averaging 89.2 (median = 90; SD = 7.93), with scores ranging from 80 to 100. Table 3 presents the corresponding category distribution.

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Table 3. Distribution of Teachers' Post-Test Score Categories (N = 12)

Category	Score Range	f	%
Excellent	≥ 90	8	66.7
Good	80–89	4	33.3
Fair	60–79	0	0.0
Poor	< 60	0	0.0
Total	–	12	100

All twelve teachers (100%) landed in either the Excellent or Good category on the post-test, with none remaining in Fair or Poor; these labels describe knowledge-test scores and should not be read as certification of proficiency in using the application, since no skills assessment was conducted. Three teachers obtained the maximum score of 100, so a ceiling effect cannot be ruled out. Compared with the pre-test, the group's mean score rose by 42.5 points, from 46.7 to 89.2. A paired t-test on each teacher's pre-test to post-test difference showed that the increase was statistically significant, $t(11) = 10.85$, $p < .001$; the mean difference was 42.5 points (95% CI [33.9, 51.1]), and the standardized effect size was $d_z = 3.13$ (the mean difference divided by the standard deviation of the differences, 13.57). Because the design was a single-group pre-test–post-test without a control group, these results indicate a temporal association, that is, an immediate change in scores, and not that the training caused the improvement; testing (repeated-measures) effects and selection effects have not been ruled out, and the significance among these 12 participants does not imply generalizability to other schools.

To see how consistent this improvement was at the individual level, Table 4 sets out each teacher's pre-test, post-test, and gain scores.

Table 4. Teachers' Individual Pre-Test, Post-Test, and Gain Scores (N = 12)

ID	Pre-Test	Post-Test	Gain Score
T01	50	90	40
T02	30	100	70
T03	30	80	50
T04	50	90	40
T05	60	80	20
T06	60	100	40
T07	60	90	30
T08	50	90	40
T09	50	80	30
T10	30	80	50
T11	40	100	60
T12	50	90	40
Mean	46.7	89.2	42.5

Teachers are identified by anonymized codes assigned at random, not by attendance-list order. The teachers agreed to the publication of their scores, in aggregate and under anonymized codes, and de-identified score data and the test items are available to reviewers or auditors on request. Every

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teacher posted a positive gain, ranging from 20 to 70 points (mean = 42.5; SD = 13.57). The largest gain was 70 points (from 30 to 100), while the smallest was 20 points (from 60 to 80).

All twelve participants therefore achieved higher post-test scores than pre-test scores. With no comparison group and with identical test items at both time points, these gains cannot be attributed to the training alone. The mean paired difference was 42.5 points (SE = 3.92; 95% CI [33.88, 51.12]). The effect size d_z was computed as the mean difference divided by the standard deviation of the paired differences (42.5 / 13.57 = 3.13); with the small-sample correction, Hedges' g_z = 2.91. The Shapiro–Wilk test on the 12 paired differences did not indicate a departure from normality (W = .94, p = .498), and a Wilcoxon signed-rank test run as a sensitivity analysis was consistent with the paired t-test (Z = −3.09, p = .002; all 12 differences were positive). Given the 10-point scoring steps, several differences were tied.

Discussion

These quantitative findings line up with those of comparable community service activities that have trained teachers to use mobile-based identification instruments. Amka and Mirnawati (2022), for instance, reported that mentoring teachers to use an Android application for identifying children with special needs improved their ability to conduct initial screening more systematically. Ndoya et al. (2023) similarly found gains in teachers' ability to identify children with special needs in inclusive schools following practice-based training. In keeping with this pattern, the post-test mean recorded here (89.2), together with the high share of teachers rated Excellent or Good (100%), supports the argument that training combining conceptual reinforcement with hands-on use of a digital instrument can equip teachers with adequate understanding in a short span of time.

The significant rise in the group mean from pre-test (46.7) to post-test (89.2) corresponds to the learning level (Level 2) within Kirkpatrick's four-level training evaluation model (Kirkpatrick & Kirkpatrick, 2006), which treats a change in participants' knowledge as one marker of a training program's success alongside reaction, behavior, and results. These scores are short-term learning outcomes only: changes in teachers' behavior or the transfer of practices within the school (Level 3), improvements in student identification (Level 4), and causal effectiveness cannot be inferred from them. A follow-up assessment several weeks after the training (for example, application usage logs, teachers' self-assessments, and changes in school procedures) is recommended for future evaluations. Because the pre-test and post-test here were completed in a matched, paired format with identities linkable across both measurements, an individual gain score could be computed for each teacher, and the paired t-test on these differences was significant ($t(11) = 10.85$, $p < .001$).

From a design standpoint, the training was structured through the TPACK framework (Mishra & Koehler, 2006): basic CIBI concepts were paired with demonstration and hands-on practice with the I-CIBI Application on the second day, with the intention of supporting the integration of technological, pedagogical, and content knowledge. The pre-test and post-test measured declarative knowledge only, so the gains reported here are not evidence that such integration occurred or that TPACK improved. Renzulli's (2005) view that identifying giftedness is multidimensional informed the instrument's design and the training content; however, the test did not assess teachers' ability to weigh several indicators of ability at once, so no claim is made about that competence.

Likewise, Gagné's, Gardner's, and Piaget's ideas were part of the training content and were not measured as outcomes. Table 5 distinguishes what was taught, what was measured, and what is only a

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conceptual interpretation. The instrument developed by Nurhastuti (2019) and used in this activity is, at its core, an attempt to capture that multidimensionality in a more structured way than the manual tests teachers had been relying on; given how low the pre-test mean still was (46.7), though, teachers' conceptual understanding will need continued reinforcement through follow-up mentoring so that using the application does not become a purely mechanical exercise.

Table 5. Alignment of Training Content, Measurement, and Interpretation

Construct or competency	Training content	Measure used	Status
Core CIBI concepts (misconceptions; Renzulli, Gagné, Gardner, Piaget)	Session 1	5 conceptual multiple-choice items	Declarative knowledge measured
Technical operation and interpretation of the I-CIBI Application	Session 2	5 technical multiple-choice items	Declarative or procedural knowledge measured; items not separately reported by skill
Hands-on use with simulated students	Session 3 and day 2	Observation of participation; no rubric	Not measured systematically
Integration of technological, pedagogical, and content knowledge (TPACK)	Design principle of the training	None	Conceptual interpretation only
Weighing multiple indicators across the seven CIBI dimensions	Session 1 content and the application	None	Conceptual interpretation only

This activity can be described as an initial dissemination or pilot use of university research in a basic-education setting, in step with national research-downstreaming policy that pushes campus research to deliver real benefit to society rather than stopping at publication (Kementerian Pendidikan Tinggi, Sains, dan Teknologi, 2025). The PPUB scheme behind this activity works as a bridge between academic research and field-level needs, a role also emphasized in other community-based research downstreaming initiatives at other universities (Suwarno et al., 2024). A two-day training does not by itself show that the application has become routine school practice, and no claim of successful scaling or widespread service implementation is made.

Conceptually, this activity relates to two of the Sustainable Development Goals (SDGs) under the 2030 Agenda (United Nations, 2015): SDG 4 (Quality Education), through its aim of helping teachers recognize students' learning needs, and SDG 17 (Partnerships for the Goals), through the partnership between a university and an elementary school. These are potential contributions only. No measurable indicators of access, reduced inequality, or partnership outcomes were collected, and the primary findings of this study concern teachers' knowledge test scores.

CONCLUSION

The training and mentoring activity on the I-CIBI Application for teachers at SD Pembangunan Laboratorium UNP combined conceptual reinforcement and technical training on the first day with guided hands-on practice on the second. Among the 12 participating teachers, the mean test score rose from 46.7 (pre-test) to 89.2 (post-test), a mean individual gain of 42.5 points (paired t-test, t(11) =

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10.85, $p < .001$, $d_z = 3.13$), and every teacher's score increased (gains of 20 to 70 points). All teachers fell into the Excellent or Good category on the post-test, compared with 25.0% Fair and 75.0% Poor on the pre-test. These results show an immediate increase in knowledge test scores only.

They do not verify independent operation of the application, screening accuracy, benefits for children, or that the application is more measurable than manual instruments; views of that kind came from the principal and the team and are reported as perceptions. The findings are limited by a single school, n = 12, two simulated students, identical pre- and post-test items, and the absence of a control group, a follow-up assessment, and a skills rubric. Operationally, the activity suggests that a short guided training can familiarize teachers with the application's concepts and procedures, while accurate screening and sustained use in schools remain to be tested. For the program to continue developing, it would help to evaluate learning at the level of individual items or aspects (conceptual versus technical) in the next cycle, so that specific areas needing reinforcement can be identified more precisely; to provide further mentoring so teachers can deepen their contextual application of core CIBI theories to real classroom cases; and to extend the program to other regular elementary schools beyond the campus, with a larger sample, a skills rubric, a parallel-form or delayed test, and a follow-up assessment.

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Author Contributions

Conceptualization, activity supervision, and writing original draft: Nurhastuti. Methodology and manuscript drafting: Syari Yuliana. Data analysis: Mardhatillah Zulpiani. Writing review and editing: Harlina Ramelan. Data collection and visualization of results (Figures, Diagrams, and Tables): Syari Yuliana and Mardhatillah Zulpiani. All named authors have read and approved the final version of the manuscript submitted. Members of the implementing team were also involved in developing the I-CIBI Application through the prior research cited above, and the same team delivered the training and analyzed its results; the evaluation was therefore not independent of the developers, and this is acknowledged as a limitation.

Conflict of Interest

The I-CIBI Application was developed from prior research by members of the author team, and the same team implemented the training and evaluated its results. The authors declare no financial conflict of interest, but disclose a potential non-financial (academic and professional) interest in the success of the application. The I-CIBI Application was registered for intellectual property protection in 2024 in

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the name of its development team. No licensing or commercial arrangement is currently in place.

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