SITTAH: Journal of Primary Education
P-ISSN: 2745-4479 E-ISSN: 2745-4487
Journal Homepage: https://jurnalfaktarbiyah.iainkediri.ac.id/index.php/sittah
Journal e-mail: jurnalsittah@iainkediri.ac.id
Page: 109-124

Students' Needs for Canva-Assisted Ethnobotany Learning: Integrating Science Literacy, Problem-Solving, and Contextual Learning

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Received: 2026-04-21; Approved: 2026-10-10; Published: 2026-10-31

Abstract

This study aimed to identify ethnobotanical learning needs through student responses and the integration of quantitative and qualitative data, thereby providing an empirical basis for developing Canva-based instruction. A convergent mixed-methods design involved 33 fourth-grade students and one teacher at MI Ibnu Al Mubarok. Student and teacher questionnaires and interviews with the teacher and two students provided the data, which were analyzed descriptively and thematically before integration. Scientific literacy responses were predominantly low (51.52%; M = 19.24, SD = 3.82), as were problem-solving responses (54.55%; M = 11.85, SD = 2.46). Learning needs were predominantly high (45.45%; M = 11.42, SD = 2.22). Interviews indicated difficulties in understanding concepts and contextual problems, limited media use, and underused school plants. The findings indicate a need for contextual, visual instruction that connects plant observations with guided problem-solving. The study contributes an evidence-to-design mapping to inform Canva-supported ethnobotany instruction in fourth-grade Natural and Social Sciences (IPAS). These implications concern instructional planning; the self-report findings neither measure actual abilities directly nor establish instructional effectiveness.

Keywords: Canva-Assisted, Ethnobotany Learning, Problem-Solving, Scientific Literacy, Students' Needs.

Abstrak

Penelitian ini bertujuan mengidentifikasi kebutuhan pembelajaran etnobotani melalui respons siswa dan integrasi data kuantitatif serta kualitatif sebagai dasar empiris untuk merumuskan arah pembelajaran berbasis Canva. Penelitian menggunakan metode campuran dengan desain konvergen dan melibatkan 33 siswa kelas IV serta satu guru di MI Ibnu Al Mubarok. Data diperoleh melalui angket siswa dan guru serta wawancara dengan guru dan dua siswa. Data dianalisis secara deskriptif dan tematik, kemudian diintegrasikan. Respons literasi sains didominasi kategori rendah (51,52%; M = 19,24; SD = 3,82), demikian pula respons pemecahan masalah (54,55%; M = 11,85; SD = 2,46). Kebutuhan pembelajaran didominasi kategori tinggi (45,45%; M = 11,42; SD = 2,22). Wawancara menunjukkan kesulitan memahami konsep dan masalah kontekstual, keterbatasan penggunaan media, serta belum optimalnya pemanfaatan tumbuhan di sekolah. Temuan ini menunjukkan kebutuhan pembelajaran kontekstual dan visual yang menghubungkan pengamatan tumbuhan dengan pemecahan masalah terbimbing. Kontribusi penelitian berupa pemetaan bukti dan arah pembelajaran untuk mendukung perencanaan pembelajaran etnobotani berbantuan Canva pada mata pelajaran Ilmu Pengetahuan Alam dan Sosial (IPAS) kelas IV. Implikasi tersebut terbatas pada

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perencanaan pembelajaran; hasil angket persepsi tidak mengukur kemampuan aktual secara langsung dan tidak membuktikan efektivitas pembelajaran.

Kata Kunci: Berbantuan Canva, Kebutuhan Siswa, Literasi Sains, Pembelajaran Etnobotani, Pemecahan Masalah.

INTRODUCTION

Science education plays an important role in developing critical thinking and problem-solving skills (Bybee, 2010; OECD, 2019). Science learning not only emphasizes mastery of concepts, but also scientific literacy to understand phenomena and use scientific knowledge in daily life (Bybee, 2010; Holbrook & Rannikmae, 2009). The 2022 PISA results show that Indonesia's science score is 383 points, below the OECD average of 485 points, and that only 34% of Indonesian students achieve Level 2 or higher in science, compared with 76% on average (OECD, 2023). This condition underscores the need to strengthen scientific literacy so that students can understand phenomena, evaluate information, and apply scientific knowledge in their daily lives (Coppi et al., 2023; Sjöström, 2025). PISA assesses 15-year-olds, so these national results provide background rather than direct evidence about the fourth-graders in this study.

Scientific literacy helps students understand scientific concepts and phenomena, analyze information, and use science knowledge in daily life (Bybee, 2010; Holbrook & Rannikmae, 2009). However, various studies show that elementary school students still have difficulty understanding science concepts and relating them to phenomena in the surrounding environment (Nugraha et al., 2021; Utami et al., 2022). These conditions can be influenced by learning that is less contextual and has not optimally involved students actively (Juliyastuti et al., 2026; Ishep & Rizkil, 2025). Therefore, learning that connects science concepts with students' real experiences and environments is needed.

Problem-solving complements scientific literacy by enabling learners to identify a problem, consider evidence, propose a solution, and evaluate its suitability (Jonassen, 2011; Pólya, 1973). Contextual tasks provide opportunities to apply these processes to observable situations. In a quasi-experiment involving 215 seventh-grade students in Pekanbaru, Suryawati et al. (2010) reported differences in problem-solving outcomes associated with contextual biology instruction. At the primary level, Cronin-Jones (2000) found greater gains in environmental science knowledge from schoolyard instruction than from corresponding classroom instruction among third- and fourth-graders. These studies support the examination of contextual learning needs, although their intervention findings do not establish that the same outcomes will occur in the present setting.

Plants in students' surroundings offer a concrete context for connecting scientific explanations, everyday problems, and community knowledge. Ethnobotany examines relationships between people and plants, including local names, uses, and cultural practices (Sabilla et al., 2023). Research with children in Suriname documented the importance of experiential contact and knowledge transmission in learning about useful plants (van den Boog et al., 2017). A school assignment involving 73 pupils also elicited family knowledge about medicinal plants (van 't Klooster et al., 2019). In India, a locally contextualized educational program improved children's identification and valuation of wild food plants (Cruz García & Howard, 2013). These field studies justify the consideration of local plant knowledge as a learning resource while recognizing differences among communities. For fourth-grade IPAS in Phase B, ornamental plants and family medicinal plants (TOGA) around MI Ibnu Al Mubarok provide a possible context for linking plant concepts with everyday experiences (Education Standards, Curriculum, and Assessment Agency, 2024; Hikmawati et al., 2025).

The Cognitive Theory of Multimedia Learning explains how coordinated words and relevant pictures can support understanding when their presentation respects learners' processing capacity (Mayer, 2009). Scaffolding and connections with prior knowledge also provide a rationale for guided activities rather than visual presentation alone (Slavin, 2012). Empirical research has examined digital support for plant learning: Huang et al. (2010) implemented a mobile plant learning system in elementary education, while Coşkunserçe (2024) investigated PlantNet-supported outdoor activities with fifth-graders. Jong (2020) found improvements in several motivational dimensions during mobile inquiry fieldwork. These studies concern other technologies, so their findings inform design principles rather than demonstrate Canva's effectiveness. Reviews by Warda et al. (2025) and Ilahy et al. (2025) provide complementary background on Canva in elementary education. In this study, Canva is used to organize plant photographs, short explanations, and guided tasks; interactivity would depend on the accompanying learning activities.

Field research further supports the examination of students' relationships with local plants before planning instruction. Kaasinen (2019) documented variation in plant recognition among Finnish students and teachers. Borsos (2019) reported improved plant knowledge through outdoor games, while Ayotte-Beaudet et al. (2023) identified conceptual and engagement-related benefits in interviews with primary students who participated in contextualized outdoor science lessons. Studies on ethnobotany and local wisdom also offer relevant educational precedents (Gayatri et al., 2023; Ishep & Rizkil,

2025). However, these studies do not identify the specific combination of perceived difficulties in scientific literacy, problem-solving, media preferences, and available plant resources at MI Ibnu Al Mubarok. A local needs assessment is therefore necessary before selecting instructional content and activities.

The contribution of this study lies in integrating students' questionnaire responses with teacher perspectives and interview themes to map learning needs and identify directions for Canva-supported ethnobotany instruction. This is a needs assessment using a convergent mixed-methods design, not a research-and-development study or an effectiveness trial. This study aims to identify learning needs in ethnobotany by analyzing student responses and integrating quantitative and qualitative data, thereby establishing an empirical basis for determining the direction of Canva-based ethnobotany instruction in fourth-grade IPAS at MI Ibnu Al Mubarok.

RESEARCH METHODS

This study used a mixed-methods approach with a convergent design. Quantitative and qualitative data were collected in the same research period, analyzed separately, and then integrated at the interpretation stage (Johnson & Onwuegbuzie, 2004). Quantitative data were used to describe students' responses to scientific literacy and problem-solving indicators, as well as students' learning needs, while qualitative data were used to clarify learning conditions, student difficulties, and media needs. The two types of data were then compared, yielding mutually supportive findings and providing an empirical basis for planning Canva-supported ethnobotanical instruction.

The research was conducted at MI Ibnu Al Mubarok during the even semester of the 2025/2026 school year. The location was purposively chosen because it contains ornamental and family medicinal plants (TOGA) relevant to the ethnobotanical context. The research population comprised 33 Grade IV students, all of whom were selected as respondents using total sampling. The inclusion criteria were that students were actively registered, participated in IPAS learning, and completed a complete questionnaire. In addition, one teacher and two students were purposively selected as qualitative informants. Teachers were selected for their direct involvement in learning, while two students were selected to represent the variation of questionnaire responses. Data from both students were used to deepen the mapping of learning difficulties and needs, not for generalization.

Data collection techniques include self-report questionnaires and semi-structured interviews. Questionnaires are used to obtain an initial picture of scientific literacy,

problem-solving skills, and students' learning needs. Because the questionnaire is self-report, the results are positioned as a perceptual picture and analysis of initial needs, rather than as an objective measure of ability. To minimize potential student perception bias, the questionnaire findings were triangulated with the results of teacher and student interviews (Johnson & Onwuegbuzie, 2004).

The research instrument consists of three questionnaires for students, namely a scientific literacy questionnaire, a problem-solving ability questionnaire, and a learning needs questionnaire, as well as interview guidelines. Teacher questionnaires are used as a supporting instrument to obtain information about learning conditions and media needs.

Table 1. Results of Instrument Validity and Reliability Test

No.	Research Instruments	Number of Items	Content Validity (Aiken's V)	Reliability (Cronbach's Alpha)	Remarks
1.	Science Literacy	10	0.83–1.00	0.87	Valid and reliable
2.	Problem-solving	6	0.83–1.00	0.82	Valid and reliable
3.	Student Learning Needs	4	0.83–1.00	0.79	Valid and reliable
Total Instrument Items		20	0.83–1.00	0.79–0.87	All items retained

Table 1 reports Aiken's V values of 0.83–1.00 and Cronbach's alpha coefficients of 0.87 for scientific literacy, 0.82 for problem-solving, and 0.79 for learning needs. These reported coefficients support content validity and internal consistency for the questionnaires. They do not, by themselves, establish that self-reports directly measure students' actual scientific literacy or problem-solving performance. Teacher questionnaires are used as a supplementary instrument to gather information on learning conditions and media needs, so they are not included in the validity and reliability testing of the three main instruments used to collect student data.

Quantitative data were analyzed descriptively using scores, percentages, means, and standard deviations, while qualitative data were analyzed thematically through information identification, coding, theme grouping, and interpretation. The teacher's questionnaire used a four-level Likert scale (1–4), with the following intervals: 3.25–4.00 = strongly agree; 2.50–3.24 = agree; 1.75–2.49 = disagree; and 1.00–1.74 = strongly disagree. The percentage score was calculated by comparing the obtained score to the maximum score, while the categorization of the teacher's response was determined based on the average score per item. Furthermore, quantitative and qualitative data were compared and

integrated to identify the convergence of findings as an empirical basis for planning Canva-supported ethnobotany instruction.

The research procedure includes four stages, namely preparation, data collection, analysis, and integration. The preparation stage includes instrument preparation and subject selection. Data collection is carried out through self-report questionnaires and interviews. Furthermore, quantitative and qualitative data are analyzed separately and integrated during interpretation to provide an overview of learning needs. The results of the research serve as the basis for formulating the direction of Canva-supported ethnobotanical instruction in subsequent research, rather than as evidence of the media's effectiveness.

RESULTS AND DISCUSSION

Results

Scientific Literacy Questionnaire Response Analysis

The research instrument uses a self-report questionnaire; the results on scientific literacy and problem-solving in this study reflect students' responses to the measured indicators rather than objective performance. The results of the scientific literacy questionnaire response analysis were obtained from 10 items on a four-level Likert scale, yielding a minimum score of 10 and a maximum of 40. Based on the range of scores, the categories were defined as very low (10.0–17.5), low (17.6–25.0), high (25.1–32.5), and very high (32.6–40.0). The distribution of student responses is presented in Table 2.

Table 2. Results of Questionnaire Response Analysis on Scientific Literacy Indicators

No.	Score Interval	Categories	Number of Students	Percentage %
1.	10.0 – 17.5	Very Low	12	36.36%
2.	17.6 – 25.0	Low	17	51.52%
3.	25.1 – 32.5	High	4	12.12%
4.	32.6 – 40.0	Very High	0	0.00%
	Total		33	100.00%
	Descriptive Statistics		Mean = 19.24	SD = 3.82

Based on Table 2, students' responses to the scientific literacy indicator were dominated by the low category at 51.52%, while the very low category reached 36.36%. Only a small percentage of students were in the high category, and none were in the very high category. These findings show that, perceptually, students still see themselves as having difficulty understanding phenomena, explaining concepts, and connecting scientific knowledge to daily life. This condition shows the need for learning that provides more

contextual experiences so that students can relate science concepts to their environment and to experiences close to their lives.

Problem Solving Questionnaire Response Analysis

The results of the problem-solving questionnaire response analysis were obtained from 6 items on a four-level Likert scale, yielding a minimum score of 6 and a maximum of 24. Based on the range of scores, the categories were defined as very low (6.0–10.5), low (10.6–15.0), high (15.1–19.5), and very high (19.6–24.0). The distribution of student responses is presented in Table 3.

Table 3. Results of Questionnaire Response Analysis on Problem Solving Indicators

No.	Score Interval	Categories	Number of Students	Percentage %
1.	6.0 – 10.5	Very Low	10	30.30%
2.	10.6 – 15.0	Low	18	54.55%
3.	15.1 – 19.5	High	5	15.15%
4.	19.6 – 24.0	Very High	0	0.00%
	Total		33	100.00%
	Descriptive Statistics		Mean =11.85	SD = 2.46

Based on Table 3, students' responses to the problem-solving ability indicator were dominated by the low category at 54.55%, followed by the very low category at 30.30%. Only a small number of students were in the high category, and none were in the very high category. This finding shows that, perceptually, students still see themselves as having difficulties when facing problems that require understanding of information, analysis, and the determination of solutions. These results underscore the need for learning experiences that provide opportunities for students to confront contextual problems and develop a gradual solution strategy.

Analysis of Students' Learning Needs

The analysis of learning needs was conducted using 4 items on a 4-level Likert scale, yielding a minimum score of 4 and a maximum of 16. Based on the range of scores, the categories are set to be very low (4.0–7.0), low (7.1–10.0), high (10.1–13.0), and very high (13.1–16.0). The distribution of students' learning needs is presented in Table 4.

Table 4. Distribution of Student Learning Needs Categories

No.	Score Interval	Categories	Number of Students	Percentage
1.	4.0–7.0	Very Low	3	9.09%
2.	7.1–10.0	Low	9	27.27%
3.	10.1–13.0	High	15	45.45%
4.	13.1–16.0	Very High	6	18.18%
	Total		33	100%
	Descriptive Statistics		Mean =11.42	SD = 2.22

Based on Table 4, students' learning needs are predominantly in the high category at 45.45%, while the very high category accounts for 18.18%. This condition indicates a need for learning that better aligns with students' learning characteristics and experiences. These findings reinforce the need for contextual, visual, and environmental learning as resources. This need further serves as the basis for considering the development of Canva-based ethnobotanical learning that can connect IPAS materials to students' real experiences.

Table 5. Descriptive Statistics of Learning Needs by Item

Item	Learning Needs Indicators	Mean	SD	Rank
Item 17	The need for media variety outside of textbooks	2.73	0.88	3
Item 18	The need for contextual material based on surrounding plants (ethnobotany)	2.82	0.95	2
Item 19	Visual display and color image requirements	2.70	0.88	4
Item 20	Visual-interactive digital media needs (Canva)	3.18	0.92	1

Overall statistics: Mean = 11.42; SD = 2.22 (High Category).

Based on Table 5, the highest need was observed for visual-interactive digital media (Canva), with a mean of 3.18 and a standard deviation of 0.92. The need for contextual materials based on surrounding plants (ethnobotany) ranked second, with a mean of 2.82, followed by the need for media variations outside textbooks, with a mean of 2.73. Meanwhile, the need for visual displays and color images obtained a mean of 2.70. Overall, the analysis of students' learning needs fell into the high category, with a mean of 11.42 and a standard deviation of 2.22. These findings show that students need more varied, contextual learning that is supported by visual-interactive media.

Table 6. Results of Teacher Questionnaires Based on Aspects

Aspects Assessed	Number of Items	Obtained Score	Maximum Score	Mean	%	Categories
Students' scientific literacy	2	7	8	3.50	87.50%	Strongly agree
Students' problem-solving skills	2	7	8	3.50	87.50%	Strongly agree
Learning practices and media	3	11	12	3.67	91.67%	Strongly agree
The need for learning media	3	11	12	3.67	91.67%	Strongly agree
Total	10	36	40	3.60	90.00%	Strongly agree

Based on Table 6, all aspects assessed by teachers were in the strongly agree category, as indicated by the average score per item. The highest percentages were found in the aspects of practice and learning media, as well as the need for learning media, at 91.67%, while scientific literacy and problem-solving skills were at 87.50%. Overall, the teacher's questionnaire score was 90.00%, with a mean of 3.60, indicating a strongly agree response. These findings show teachers' support for strengthening learning and using media that better align with students' needs. The interviews were conducted to strengthen the questionnaire results by gathering information on learning conditions, student difficulties, media use, and learning needs. The results of the interviews were analyzed thematically and summarized in Table 7.

Table 7. Thematic Analysis of Teacher and Student Interview Results

Theme	Code	Source	Key Findings/Quotes
Science literacy difficulties	LS-1	Teacher	"Children's scientific literacy is still relatively low," and students have difficulty connecting concepts with surrounding phenomena.
Science literacy difficulties	LS-2	Student 1	"Often confused when working on long science questions or story problems."
Problem-solving difficulties	PM-1	Teacher	Students struggle when faced with story problems or contextual cases and are "confused about determining the solution."
Problem-solving difficulties	PM-2	Student 1	Students need the teacher's re-explanation to understand and solve the problem.
Learning practices and media	MD-1	Teacher	Learning is still predominantly lectures, textbooks, whiteboards, and practice questions; Canva is not yet in use.
Learning practices and media	MD-2	Student 1	"It is rare to use color pictures or videos."
Contextual learning needs	KB-1	Teacher	The school environment has ornamental and medicinal plants, but they have not been optimally utilized in IPAS learning.
Visual media needs	KB-2	Student 2	Preference for visual media (theme KB-2); the original quotation requires verification against the interview transcript.
Canva-based ethnobotany needs	KB-3	Teacher	Teachers support the development of Canva-based ethnobotanical learning to help with concept understanding and problem-solving.
Canva-based ethnobotany needs	KB-4	Student 2	Students are interested when plants in the school environment are presented through Canva images and hands-on examples.

Source: Interview results of teachers and students of Grade IV MI Ibnu Al Mubarok.

The interview findings showed that students had difficulty understanding concepts and solving problems, while the use of learning media remained limited. This situation is clearly linked to the limited use of learning media, which means the learning process has

not yet fully succeeded in providing students with concrete, contextual learning experiences. On the other hand, teachers and students showed a need for more visual learning and used the school environment as a learning resource. This need highlights the importance of providing a learning experience that goes beyond the mere delivery of content, one that encourages students to observe, understand, and solve problems actively.

Integration of Quantitative and Qualitative Findings

Integration compared the response distributions and item-level learning needs with the themes from the teacher questionnaire and interviews. Low or very low responses accounted for 29 of 33 students in scientific literacy (87.88%) and 28 of 33 in problem-solving (84.85%). High or very high learning needs were reported by 21 of 33 students (63.64%). Interviews described conceptual confusion, difficulty interpreting contextual problems, limited visual media, and underused school plants. Table 8 makes the integration explicit by connecting these findings with proposed instructional directions. The mapping represents an interpretation of convergent evidence, not an evaluated instructional product.

Table 8. Mapping of Evidence, Learning Needs, and Proposed Learning Directions

Quantitative Evidence	Interview Evidence	Identified Need	Proposed Direction
Scientific literacy: 29/33 low or very low; M = 19.24	LS-1, LS-2: concept links and longer questions are difficult	Guided explanations tied to observable phenomena	Observe plant parts; pair photographs with short explanations and evidence prompts.
Problem-solving: 28/33 low or very low; M = 11.85	PM-1, PM-2: contextual cases require further explanation	Stepwise support for interpreting and solving problems	Use a plant-care case with prompts to identify the problem, compare observations, propose and check a solution.
Plant-based content: M = 2.82; SD = 0.95	KB-1, KB-4: available plants are underused; interest in direct examples	Connect IPAS concepts with familiar plants and uses	Prepare observation tasks and locally verified plant-use cards for ornamental plants and TOGA.
Digital media: M = 3.18; visual displays: M = 2.70; variety: M = 2.73	MD-1, MD-2: textbook reliance and limited visual media	Varied, concise visual resources integrated with activities	Use Canva to prepare plant photographs, comparison sheets, and guided task cards.

Note. Proposed directions are inferred from the integrated findings and have not been implemented or tested. Counts summarize response categories, not measured ability levels.

Discussion

Scientific literacy responses averaged 19.24 (SD = 3.82), with 87.88% in the low or very low categories. Interview codes LS-1 and LS-2 provide evidence of perceived difficulty in connecting concepts to surrounding phenomena and interpreting longer

science questions. Together, these findings identify a need for supported explanation and contextual interpretation; they do not diagnose students' performance on scientific literacy tasks. This distinction matters because scientific literacy includes applying knowledge and interpreting evidence, and requires construct-aligned assessment (Fives et al., 2014; Holbrook & Rannikmae, 2009). The schoolyard findings of Cronin-Jones (2000) and the interview-based findings of Ayotte-Beaudet et al. (2023) provide a rationale for exploring direct plant observation followed by guided explanations. Their results support the proposed direction, but cannot substitute for evaluating it in this class.

Problem-solving responses averaged 11.85 (SD = 2.46), with 84.85% in the low or very low categories. Interview codes PM-1 and PM-2 describe difficulty interpreting contextual cases and dependence on further teacher explanation. These symptoms point to the need for explicit prompts to understand a problem, select relevant observations, propose an explanation, and check a solution. This sequence is consistent with Pólya's (1973) problem-solving framework and Jonassen's (2011) emphasis on designing meaningful problem situations. Suryawati et al. (2010) provide field evidence for contextual biology instruction at the secondary level. For fourth-graders, the proposed adaptation is a shorter, guided task based on observable school plants, with effectiveness to be assessed in subsequent testing.

The highest item-level need concerned Canva-supported visual-interactive media (M = 3.18, SD = 0.92). Interview codes MD-1 and MD-2 indicated reliance on textbooks, whiteboards, and exercises, with limited use of pictures or videos. This convergence supports the offering of more varied representations, but does not establish that any particular platform is superior. Mayer's (2009) theory supports pairing relevant plant photographs with concise explanations and prompts. Huang et al. (2010), Jong (2020), and Coşkunserçe (2024) offer empirical examples of digital tools for outdoor learning, whereas Habsari et al. (2026) provide a review-based context. Canva could serve as an authoring tool for these materials; its instructional value would depend on task design, teacher guidance, and evaluation.

The direction toward contextual ethnobotany follows three linked findings: students reported a need for material based on surrounding plants (M = 2.82, SD = 0.95); the teacher identified underused ornamental and medicinal plants (KB-1); and Student 2 expressed interest in plant images accompanied by direct examples (KB-4). Accordingly, Table 8 proposes linking direct observation with locally grounded descriptions of plant uses and guided questions. Local-wisdom research supports the examination of this

connection (Verawati & Wahyudi, 2024), while field studies by Cruz García and Howard (2013) and van 't Klooster et al. (2019) illustrate how community knowledge can be used as educational content. Local names and uses would need to be verified during subsequent material preparation. The proposed activities are instructional implications, not activities implemented in this study.

The evidence-to-design mapping clarifies the study's contribution: perceived difficulties indicate where scaffolding is needed, item-level responses identify preferred content and representations, and interviews identify available resources and classroom constraints. The resulting priorities are guided by scientific explanation, contextual problem-solving, visual materials, and structured use of school plants. This mapping offers a local empirical basis for subsequent instructional design. It does not demonstrate learning gains or validate a Canva-based model, and it should be adapted and reassessed before use in other classrooms.

CONCLUSION

This study reveals that student responses to indicators of scientific literacy and problem-solving skills predominantly fall into the low and very low categories. A needs analysis, supported by interview data, indicates a requirement for more contextual and visual instruction that uses students' immediate environment. These findings provide an empirical basis for formulating Canva-supported ethnobotany instruction as an alternative approach for fourth-grade IPAS. The study contributes an explicit mapping from questionnaire and interview evidence to instructional priorities. Its practical implication is to guide the selection of plant-based contexts, visual representations, and scaffolded problem-solving tasks. However, the study has not evaluated the effectiveness of this proposed instruction. Future research should develop comprehensive materials and assess their effectiveness using valid instruments aligned with the constructs being measured.

This study has several limitations. First, self-report questionnaires introduce potential perceptual bias; the findings therefore represent an initial overview of learning needs rather than direct measurements of actual abilities. Second, the study involved 33 students in one class and one teacher, with interviews involving only two students and the teacher. The findings cannot be generalized broadly and require investigation in diverse contexts. Third, this needs assessment does not encompass comprehensive development of materials or effectiveness testing of Canva-supported ethnobotany instruction. Future research should include a more diverse range of participants and schools, combine

questionnaires with performance-based assessments or valid, reliable tests, and subject instructional materials to expert validation and limited pilot testing before evaluating their effects on scientific literacy and problem-solving.

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