



Development of an IPAS supplementary book oriented toward *Tri Kaya Parisudha* for elementary school students

I Ketut Suparya^{*1}, I Ketut Catur Paramita², Kadek Dipapastana³

¹Institut Agama Hindu Negeri Mpu Kuturan, Singaraja, Indonesia; iketutsuparya@gmail.com

²Institut Agama Hindu Negeri Mpu Kuturan, Singaraja, Indonesia; caturparamita@gmail.com

³Institut Agama Hindu Negeri Mpu Kuturan, Singaraja, Indonesia; dipapastan@gmail.com

^{*}Corresponding author: I Ketut Suparya; E-mail addresses: iketutsuparya@gmail.com

Article Info

Article history:

Received May 16, 2026

Revised June 24, 2026

Accepted July 28, 2026

Available online August 17, 2026

Keywords: Elementary school, IPAS learning, Supplement book, *Tri Kaya Parisudha*

Copyright ©2025 by Author. Published by Lembaga Penelitian dan Pengabdian kepada Masyarakat (LPPM) Universitas PGRI Mahadewa Indonesia

Abstract. The integration of local wisdom into the learning of science and Integrated Social Sciences (IPAS) is increasingly recognised as a strategy to promote contextual learning and scientific literacy. However, previous research has mainly emphasised ethnoscience-based learning models and culturally responsive teaching, while the development of IPAS teaching materials that systematically integrate *Tri Kaya Parisudha* as a pedagogical framework is still limited. This research aims to develop and validate additional IPAS textbooks based on *Tri Kaya Parisudha* to support the implementation of *the Independent Curriculum* for fourth-grade elementary school students. The study uses a Research and Development (R&D) approach adapted from the Borg and Gall model, including needs analysis, product design, development, expert validation, revision, and refinement. Content validity was evaluated using a V Aiken involving nine experts in content, instructional media, and language. Needs analysis shows

that existing IPAS textbooks provide limited integration of Balinese local culture and contextual learning experiences. The textbooks developed organise learning activities around *Manacika* (thinking good and right), *Wucika* (saying good and right), and *Kayika* (doing good and right). The validation results showed high validity in content ($V = 0.98$), media ($V = 0.91$), and language ($V = 0.88$), suggesting that the textbooks are well suited for classroom use. This research contributes an additional culturally responsive textbook that expands the use of *Tri Kaya Parisudha* as a pedagogical framework while supporting scientific literacy, critical thinking, character development, and the implementation of *the Independent Curriculum*.

Introduction

Elementary education is the foundation for shaping students' knowledge, skills, and character. In the context of the Indonesian Independent Curriculum, learning activities are expected to be student-centered, contextual, and in harmony with the local socio-cultural environment in each educational unit (Herman & Muadin, 2023). Within this framework, Natural and Social Sciences (IPAS) subjects play an important role in preparing elementary school students to face 21st-century challenges by developing scientific thinking, critical reasoning, and cultural awareness (Permatasari et al., 2024).

Furthermore, social studies learning is not only oriented toward mastering scientific concepts but also directed at building students' ability to understand the relationship between natural phenomena, social life, and cultural values in society. Integrating knowledge, skills, and attitudes in

IPAS learning is important for developing a student profile that is adaptive, creative, and socially responsible toward the surrounding environment. Therefore, the implementation of IPAS learning requires innovative teaching materials that are not only able to improve students' scientific literacy, but also provide meaningful learning experiences through integrating local contexts and regional cultural wisdom so that students can construct knowledge in a more authentic and relevant way to daily life (Dina Restiani et al., 2024; Suryanti et al., 2020).

Although important, IPAS learning in Indonesian primary schools still faces significant challenges. The low science literacy achievement of Indonesian students in the Programme for International Student Assessment (PISA) indicates that the quality of science learning still needs fundamental improvement. PISA 2022 results show that Indonesia's science literacy score reached only 383, far below the OECD average of 485. Furthermore, only about 34% of Indonesian students achieve the minimum competency (Level 2) in science literacy, while the OECD average is around 76%. This shows that most students still struggle to explain scientific phenomena, evaluate evidence, interpret data, and use scientific concepts to solve problems in daily life (Antoninis et al., 2023; Pisa, 2022).

These problems are also related to the achievement of Sustainable Development Goal (SDG) 4, namely *Quality Education*, which targets the implementation of inclusive, quality education and equips students with the knowledge, skills, values, and competencies needed to face the challenges of the 21st century. SDG 4 not only emphasises increasing school participation rates but also improving the quality of learning outcomes through the development of critical thinking skills, science literacy, creativity, problem-solving, and education for sustainable *development*. Thus, the low PISA results show that implementing quality education as mandated in SDG 4 still faces considerable challenges, especially in science learning (Rahayu et al., 2024).

In the Indonesian context, implementing the Independent Curriculum provides a new direction for improving IPAS learning through student-centered, contextual, and meaningful learning. Science subjects are designed to help students understand the relationship between natural phenomena, the social environment, and culture in an integrated manner. However, implementing the Independent Curriculum still faces several obstacles, especially the limited availability of teaching materials that reflect the characteristics and potential of local culture. Most textbooks used in schools are still general and nationally oriented, so they have not integrated local cultural contexts as authentic learning resources. This causes students to learn IPAS concepts in the abstract and not connect them to the cultural experiences they encounter in daily life, so conceptual understanding and critical thinking skills have not developed optimally. This is evidenced by the results of a preliminary study on 110 elementary school students in group III of Buleleng District, which showed an average critical thinking ability score of 65 (SD = 7.5), indicating that the quality of learning and teaching materials used still needs to be improved through the development of local culture-based textbooks. These findings align with previous research showing low critical thinking skills among elementary school students in Buleleng (Fajari & Chumdari, 2021; Purbarani et al., 2018; Susiani et al., 2025; Sugihartini & Swisnandy, 2025).

From the results of observation, many factors that are obstacles to the achievement of learning objectives can be broadly grouped into four factors, namely: (1) the selection of inappropriate learning model approaches or strategies, (2) students' initial knowledge that has not been well accommodated in learning, (3) the use of multi-site environmental potential that is rarely (not) used as a learning resource, (4) the form and method of assessment of learning acquisition used is not appropriate with the essential purpose of science education. These problems must be addressed immediately to improve elementary school students' critical thinking skills and science literacy.

Effective learning must be linked to students' life context, experience, and culture so the knowledge gained becomes more meaningful. Local culture is part of daily life and shapes how people think, behave, and interpret phenomena in their surrounding environment. Therefore, the learning process cannot be separated from the social and cultural context in which learners grow and develop. This view aligns with Bruner's constructivist theory, which states that students actively build knowledge through their interactions with their learning environment and experiences. Vygotsky also emphasised that cognitive development is influenced by social and cultural interactions, so cultural context becomes an important source of learning. Furthermore, Dewey explained that real experience is central to the learning process, so learning materials must relate to students' lives. In line with that, *the Culturally Responsive Teaching* approach emphasises the importance of integrating learner culture into curriculum, learning strategies, and teaching materials so that learning becomes more relevant and inclusive. In science learning, local culture can be an authentic context that helps students understand scientific concepts more deeply (Gay, 2018; Shodik, 2021; Sundari & Fauziati, 2021). Research by Suja (2011) also shows that science books in general still use material sourced from the West. In addition to materials sourced from the West, learning models/strategies/methods also use Western traditions, so that science learning (IPA) in schools has the potential to cause incompatibility (*clash*) and conflict in students

Several studies have integrated local cultural wisdom into science learning. Students who study science in a culturally relevant framework show higher engagement, stronger conceptual understanding, and a deeper appreciation of their cultural identity (Sanjayanti et al., 2022). Integrating local culture into learning is a principle of ethnoscience, incorporating indigenous knowledge into formal science education (Delimanugari et al., 2026; Rosyidah et al., 2025). This has been identified as a promising strategy to improve academic outcomes while maintaining cultural sustainability (Bulkani et al., 2022). In Bali, integrating local culture into the learning process is urgent, given Hindu-Balinese culture's rich philosophical and pedagogical traditions.

One local Balinese cultural tradition that can be integrated into the learning process is *Tri Kaya Parisudha*. *Tri Kaya Parisudha* is a Hindu-Balinese philosophical concept that consists of three interrelated dimensions of wise behaviour, namely Manacika (thinking good and right), Wacika (saying good and right), and Kayika (doing good and right) (Suparya et al., 2025). This philosophy guides individuals towards integrity and harmonious social interaction by harmonising thoughts, language, and actions. Several studies have documented the relevance of *Tri Kaya Parisudha* in contemporary education, particularly its ability to integrate character education with cognitive and procedural learning (Suryawan et al., 2024; Wardhani et al., 2024).

Although the pedagogical value of *Tri Kaya Parisudha* is increasingly recognised, systematic teaching materials that operationalise this philosophy in the IPAS curriculum remain very limited. The Merdeka Curriculum explicitly encourages educational units to develop contextual teaching materials that reflect local geographical, social, and cultural conditions (Kemendikbudristek, 2022). However, an analysis of the available IPAS textbooks used to teach Class IV, including those published by the Ministry of Education and Culture and other publishers, reveals the absence of content and context related to local Balinese culture.

Various studies have shown that integrating local wisdom into science and science learning can improve science literacy, critical thinking skills, learning outcomes, and students' character through ethnoscience approaches and contextual learning. Other research also revealed that *the values of Tri Kaya Parisudha* have great potential in strengthening character education, ethics, and the formation of student behaviour in the school environment. However, these studies generally still implement *Tri Kaya Parisudha* as a character value in the learning process or school culture, not as a pedagogical

framework that is systematically integrated into IPAS teaching materials (Rosa et al., 2025; Sutanto et al., 2026).

In addition, existing teaching materials remain oriented more toward mastering scientific concepts without connecting them to students' local cultural experiences in a structured manner. As a result, there is no textbook or complementary book of IPAS that comprehensively operationalises *the stages of Manacika* (thinking well and correctly), *Wacika* (speaking well and correctly), and *Kayika* (doing good and right) as a foundation for presenting materials, learning activities, and assessments. These limitations show a gap between the demands of the Independent Curriculum, which encourages contextual learning based on character and local culture, and the availability of teaching materials that support its implementation in elementary schools. Therefore, this research seeks to fill this gap through the development of a complementary book of IPAS based on *Tri Kaya Parisudha* that not only integrates local cultural values as learning content, but also makes it a pedagogical framework in designing a learning experience that is contextual, meaningful, and oriented towards the development of science literacy and students' critical thinking skills.

This research is expected to make a theoretical contribution by enriching the study of social studies learning based on local culture through the integration of *the Tri Kaya Parisudha* philosophy as a pedagogical framework that combines cognitive, affective, and psychomotor aspects. This integration expands the application of Bruner's theory of constructivism, Vygotsky's social constructivism, Dewey's Experiential Learning, and *Culturally Responsive Teaching* in developing contextual teaching materials in elementary schools.

Practically, this research produces a complementary IPAS book that is valid, practical, and in accordance with the characteristics of elementary school students in Bali. The book is expected to be an alternative teaching material that supports the implementation of the Independent Curriculum, improves students' science literacy and critical thinking skills, strengthens the Pancasila Student Profile, and preserves local cultural values through meaningful learning. Methodologically, this study offers a model for developing complementary science books that integrate the philosophy of *Manacika*, *Wacika*, and *Kayika* into material preparation, learning activities, and assessments. This model can serve as a reference for researchers and teaching-material developers in creating local culture-based learning products in various regions according to their respective social and cultural characteristics.

Based on these problems, the formulation of the problem in this study is: What is the validity of the *Tri Kaya Parisudha-oriented* IPAS supplement book? This research aims to develop and validate a complementary IPAS book for grade IV elementary school students that is explicitly oriented to the *Tri Kaya Parisudha* learning cycle. This complementary book integrates the local Balinese cultural context across IPAS topics by structuring student learning activities around the three phases of *Tri Kaya Parisudha*, namely *manacika* (thinking well and right), *wacika* (speaking well and right), and *Kayika* (doing good and right).

Method

Types of research

This research employed a Research and Development (R&D) design, following the procedural model proposed by Borg and Gall (Gall et al., 1983). The ten-step model encompasses research and information collection, planning, preliminary product development, preliminary field testing, main product revision, operational field testing, operational product revision, main field testing, final product revision, and dissemination. This model was chosen because it provides a systematic procedure for developing, validating, and evaluating educational products so as to produce a valid,

practical, and effective product for use in the learning process. The stages of Borg and Gall's model are shown in Image 1.

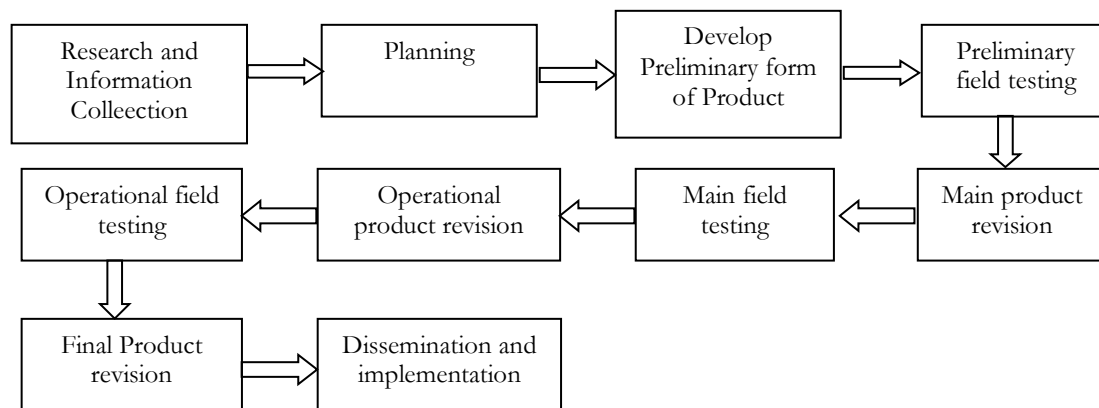


Image 1. The product development stages of Borg and Gall

Research Subject

The research subjects in this study will be used to trial the research instrument. The subjects in this study are grade IV students and teachers in Buleleng Regency. Buleleng Regency was chosen because it implements an independent curriculum at the fourth-grade level of elementary schools. The subjects of the trial in this study consist of (1) textbook validation test subjects and (2) initial field test subjects. The textbook validation test consisted of 9 validators, all of whom were academics with Doctoral qualifications and more than 10 years of teaching experience, including 3 material experts, 3 learning media experts, and 3 linguists. The initial field test subjects at this stage of the study used 1 class group of 30 students in class V from one of the schools that had implemented an independent curriculum, namely Sekolah Dasar Negeri 4 Gobleg, Banjar District, Buleleng Regency. Class V students were selected because this study is only at the validation stage, so the test was carried out on students who had already received material from the developed book, namely class IV material.

Development Methods

The development of the *Tri Kaya Parisudha-oriented IPAS supplement book* uses Phase B independent curriculum material at the grade IV elementary school level. The IPAS supplement book is developed with a *Tri Kaya Parisudha* orientation. In this study, product development uses the Borg and Gall development model, but it is limited to the fifth step because, in the new research conducted at the product validation stage, the development method can be explained as follows.

Research and Information Collecting

At this stage, the researcher analyzes the potential and problems in elementary schools. At this stage, the researcher identified issues related to the use of science textbooks in elementary schools. The researcher collected data on potential problems through literature reviews and field studies. The researcher conducted literature studies by examining several previous studies on science textbook packaging, and field studies through observations and interviews with elementary science teachers. At this stage, the research subjects are findings from previous research and elementary science teachers. Meanwhile, the object of the research is the analysis of needs related to the learning and utilisation of tri-rich *Parisudha-oriented IPAS supplement books*, especially at the elementary school level.

Planning

At this stage, the researcher reviewed the independent curriculum document, especially the learning outcomes (CP) for Phase B, Grade IV of elementary school. At this stage, the researcher also conducted a literature review to collect supporting theories related to tri-rich parisudha-oriented IPAS learning, which were used to develop textbooks according to the selected topic. At this stage, the research subjects are independent curriculum documents and literature books, while the research objects are learning outcomes (CP), learning objectives (TP), ATP, Phase B flow (ATP) for grade IV elementary school, and theories related to the selected topic.

Develop Preliminary Form of Product.

The textbook design in this study was carried out by mapping the selected materials, which were adjusted to CP, TP, and ATP listed in the Independent Curriculum. The material is presented in the form of chapters consisting of several material topics by integrating culture into science content and applying *the learning strategy of Tri Kaya Parisudha (Manacika, Wacika and Kayika)*. Table 1 shows the mapping of the scope of materials and core materials to be developed in this study.

Table 1. Mapping the Scope of Material and Core Material

Scope of Material	Core Material
Living Creatures and Life Processes	a. Relationship between the form and function of human body parts (five senses and skeleton) b. Needs of living things c. Life cycles d. Biodiversity e. Conservation of living things f. Ecosystems
Substances and Objects	a. Form of Substance b. Change of state of matter
Energy and Its Changes	a. Sources and forms of energy b. Processes of energy transformation c. Force and motion d. Simple machines
Earth and the Universe	a. Conservation of Natural Resources b. Water Cycle

Preliminary Field Testing

The next stage is a limited trial stage. The limited trial was carried out on grade V students of Sekolah Dasar Negeri 4 Gobleg because the school has implemented an independent curriculum. This cob test ensures that the textbook material aligns with the demands of the independent curriculum. At the field trial stage, the research subjects are science teachers and grade V students at Sekolah Dasar Negeri 4 Gobleg, while the research object is input or suggestions from the trial results, limited to the draft textbook developed. Limited trials were carried out on one of the material topics in the draft book. The results of this cob test will be used as input/suggestions to improve the draft book.

Main Product Revision

A major product revision is based on the test suggestions. If obstacles arise during implementation, revisions are made to the textbook design. This stage produces a revised draft textbook based on a limited trial.

Data Collection Methods and Instruments

Research instruments in the development of science textbooks integrated with local culture: *Tri Kaya Parisudha*.

Table 2. Data Collection Methods

No	Data	Data Collection	Instruments
1	Needs Analysis	Questionnaire	Needs analysis questionnaire
2	Validity of the textbook	Questionnaire	Textbook validity questionnaire

Table 3. Instrument Grid Analysis Need

No	Points of interest	Indicators
1	Potential that supports the development of teaching materials	Learning outcomes, literacy science, critical thinking skills
2	The problem faced	Use of textbooks in the learning process
3	Need for teaching materials oriented to local <i>Tri Kaya Parisudha</i>	The need for the development of an integrated textbook on local culture, <i>Tri Kaya Parisudha</i>
4	Contents of the textbook	The textbook contains a map concept, learning purposes, oriented material on local culture, <i>Tri Kaya Parisudha</i> , student activities, summary material, as well as exercise question evaluation
5	Type of question evaluation	Evaluation questions designed in accordance with science material which is capable of stimulating students to increase science literacy and critical thinking

Table 4. Instrument Grid Validity of Book Contents

No.	Aspect	Indicator
1	Cover	Clarity and attractiveness of the cover
2	<i>Layout</i> and Text Writing	Quality <i>layout and</i> order of writing
3	Presentation Content/Material	Clarity of description material, table, and picture
4	Introduction	Clarity of the background, objective, target readers, scope, and setting materials and instructions used.
5	Book Contents	Learning objectives, essential questions, material, activities for students, evaluation, bibliography
6	Language	Use language that is good and true

Source: adaptation of (Minister of Education and Culture Regulation Number 8 of 2016, 2016; Suartama, 2016)

Table 5. Instrument Grid Language Validation

No	Aspect	Indicator
1	Straightforward	1. Accuracy of sentence structure 2. Effectiveness of sentences 3. Standardisation of terms
2	Communicative	4. Understanding of the message or information

No	Aspect	Indicator
3	Dialogic and interactive	5. Ability to motivate participants to educate
4	Suitability with the development of participant education	6. Suitability with intellectual development of participant education 7. Suitability with floor development of emotional participant education
5	Suitability with rule language	8. Language accuracy 9. Accuracy of spelling

Source: adaptation of (Minister of Education and Culture Regulation Number 8 of 2016, 2016; Suartama, 2016)

Table 6. Instrument Grid Media Validation

No	Aspect	Indicator
1	Size book	1. Compliance with ISO standards 2. Compliance with content material in the size book
2	Cover design book	3. Accuracy illustration/image Which used on the cover 4. The letters used are interesting 5. The letters used are easy to read
3	Content design book	6. Compliance with media/ images used 7. Quality picture in description material 8. Accurate placement of pictures 9. Accuracy of picture size 10. Accuracy of size letter 11. Accuracy of type letter 12. Quality table 13. Space between text in accordance 14. Placement of title, subtitle, and caption No bother understanding 15. Form accurate and proportional

Source: Adaptation of (Minister of Education and Culture Regulation Number 8 of 2016, 2016; Suartama, 2016)

Data Analysis Techniques

The product developed was an IPAS supplement book for Grade IV elementary school students, comprising a student book and a teacher book. The supplement book's content was grounded in the Phase B Learning Achievement (BSKAP No. 008/H/KR/2022) and aligned with topics typically addressed in IPAS at Grade IV (Kemendikbudristek, 2022). Each chapter was structured around the *Tri Kaya Parisudha* learning cycle, integrating Balinese cultural contexts (such as traditional instruments, ceremonies, and ecological practices) as entry points for scientific exploration.

The data analysis technique for analyzing the requirements for textbook development utilized the average percentage. The data analysis technique for product validation utilized a validator opinion validation sheet, applying the Aiken V formula with the following criteria: score 1: poor, score 2: fair, score 3: satisfactory, score 4: good, score 5: very good. The validation test involved 9 validators, comprising 3 content validators, 3 media validators, and 3 practitioners. Each validator was asked

to rate the textbook based on the local culture of *Tri Kaya Parisudha*, using the Aiken V formula. The Aiken V coefficient was calculated using the following formula:

$$V = \Sigma s / [n(c-1)] \dots\dots\dots (1)$$

Notes: V = item validity index; s = r – lo (r = validator's rating; lo = lowest possible rating); Σs = sum of s values across all validators; n = number of validators; c = number of rating categories. The AV value is ≥ 0.75 , indicating a high level of agreement among the experts assessing the educational development product and widely used as a minimum threshold in educational development research (Azizah & Alnashr, 2022). The study tabulated and interpreted results from each validation domain using descriptive qualitative analysis.

Results and Discussion

This study began with the stages of research and information collection (research and data collection). Needs assessment analysis of the development product was carried out. The researchers conducted a needs assessment by distributing questionnaires to teachers who have implemented an independent curriculum and by directly observing the learning process. Observations focused on the books used to teach Grade IV science at the school level. The results were presented as responses from teachers who teach Grade IV science in schools that receive the school program driver. Analysis of the need for development of textbooks for Grade IV science is done with a spread questionnaire to 30 teachers in the unit school drivers spread across the nine sub-districts in the Regency Buleleng; a summary of the data obtained can

Based on the results of the analysis of the needs for integrated science textbooks for local culture, *Tri Kaya Parisudha*, there are five aspects that thirty (30) teachers want to know, including: (1) potential Which support developmentmaterial teaching ; (2) problems faced; (3) the need for teaching materials oriented towards local culture *Tri Kaya Parisudha* ; (4) content of textbooks; (5) types of evaluation questions. Aspects related to potential support for developing teaching materials from 30 respondents show that 25 people (83.33%) stated that student learning outcomes in science have not yet met the criteria for achieving learning objectives. Other indicators in this area show that 83.33% of respondents state that science literacy is not yet optimally developed in the learning process. As many as 66.67% of respondents state that critical thinking skills are not yet optimally trained in the learning process. Related aspects with the problems faced by students in the learning process show that as many as 84% indicate that the textbooks used have not optimally trained students' scientific literacy, as many as 66.67% stated that the textbooks used have not optimally trained students' critical thinking skills, and as many as 90% of respondents stated that the textbooks used have not integrated local culture.

The need for local culture-oriented teaching materials for *Tri Kaya Parisudha* shows that 100% of respondents stated that it was necessary to develop books. An IPAS-oriented supplement for *Tri Kaya Parisudha* is necessary, with specifications that support scientific literacy and students' critical thinking skills in understanding science material. As many as 96.67% of respondents stated that books are very necessary, an IPAS-oriented supplement for *Tri Kaya Parisudha*, which is able to increase students' scientific literacy, and as many as 90% of respondents agreed that it is necessary to develop textbooks, an IPAS-oriented supplement for *Tri Kaya Parisudha*, to improve students' critical thinking skills.

Regarding the contents of teaching materials, 93.33% of respondents stated that textbooks should include maps. Concept, purpose of learning, oriented material, local culture, *Tri Kaya Parisudha*, student activities, summary material, as well as exercise questions and evaluation. Related to the

type of question evaluation, as many as 90% of respondents state that question evaluation is designed in accordance with science material, which is capable of stimulating students to increase scientific literacy, and as many as 93.3% of respondents state that question evaluation is designed in accordance with science material, which is capable of stimulating students' critical thinking skills. Regarding the types of questions developed, respondents agreed 100% on using question objectives and question descriptions when packaging questions in the textbook.

Based on the results of *the needs assessment*, observations in the field, assessment of textbooks that have been owned by previous teachers, and results of interviews with science teachers, the following problems were obtained: (1) Textbooks used by science teachers only depend on books from the publisher and assistance from the government. Based on observations and analysis of the books used by teachers and students, no books integrate local culture, *Tri Kaya Parisudha*, into their content. (2) In the learning process, teachers tend to only convey science concepts using lecture methods according to the contents of textbooks and do not provide enough training to develop students' thinking and stimulate their scientific literacy. (3) Some teachers still experience difficulties in developing teaching materials that align with the principles of the independent curriculum. Under the independent curriculum, teachers are expected to develop teaching materials aligned with government-determined learning outcomes and integrate local culture into children's learning.

Furthermore, this study focuses on the planning stage. At this stage, the researchers develop science-oriented textbooks on local culture, *Tri Kaya Parisudha*, for grade IV elementary school, referring to the Merdeka curriculum. Science textbooks are reference books used by students in science learning at the basic school level. This textbook will integrate local cultural content and context, *Tri Kaya Parisudha*. This textbook will use science material for class IV, phase B, in the independent curriculum. This book integrates local cultural context and content in accordance with the science material being studied.

Development of an integrated science textbook culture local *Tri Kaya Parisudha* use guide achievements learning based on the Decree of the Head of the Curriculum Standards and Education Assessment Agency of the Ministry of Education, Culture, Research and Technology Number 008/H/KR/2022 concerning achievements learning in children's education age early childhood, elementary education level, and secondary education level in the Merdeka curriculum. After the development phase, the validation process covers three dimensions: content validity, media validity, and linguistic validity. Three independent validators assess each dimension, and the resulting Aiken V index is reported as follows.

Content Validity

Three material experts assessed content validity based on five main aspects: suitability of material coverage, presentation layout, content structure, relevance of cultural integration, and alignment with the Independent Curriculum. Table 7 presents the results of the content validity assessment.

Table 7. Content validity results of the *Tri Kaya Parisudha*-oriented IPAS supplement book

No	Aspect	Aiken's V Index	Category
1	Coverage and scope of content	1.00	Highly Valid
2	Layout and typographical presentation	1.00	Highly Valid
3	Content structure and organisation	0.96	Highly Valid
4	Cultural integration and local wisdom relevance	0.95	Highly Valid

No	Aspect	Aiken's V Index	Category
5	Alignment with Merdeka Curriculum Phase B	1.00	Highly Valid

The content validity assessment yielded an average Aiken's V index of 0.98, placing the supplement book in the "highly valid" category across all five evaluated aspects. Validators affirmed that the topics, depth of material, and learning steps were appropriately aligned with the Phase B Learning Achievement (CP) and the Learning Objectives (IP) of the Merdeka Curriculum. Validators assessed the integration of Balinese cultural content, including traditional ceremonies, local instruments, and indigenous ecological practices, as accurate and contextually meaningful. These findings support the argument that culturally embedded instructional materials can serve as valid vehicles for IPAS learning without compromising scientific rigour (Bulkani et al., 2022; Sanjayanti et al., 2022).

Media Validity

Three media experts assessed the media's validity by evaluating book size, cover design, and content layout. Table 8 presents the results of the media validity assessment.

Table 8. Media validity results of the *Tri Kaya Parisudha*-oriented IPAS supplement book

No	Aspect	Aiken's V Index	Category
1	Book size and physical format	0.96	Highly Valid
2	Cover design and visual identity	0.92	Highly Valid
3	Interior layout and content design	0.91	Highly Valid

Media validity achieved an average Aiken's V of 0.91. Validators noted that the book met national textbook standardization requirements for size, cover design, and interior content layout. The incorporation of culturally evocative illustrations aligned with Balinese artistic aesthetics was identified as a particularly effective design feature that enhances student engagement. These results align with research showing that visually appealing, culturally congruent instructional materials increase students' motivation and improve comprehension of abstract scientific concepts (Pratiwi et al., 2022).

Language Validity

Three linguistic experts assessed language validity by evaluating language simplicity, readability, dialogical style, suitability for student development, and adherence to Indonesian language rules. Table 9 presents the results of the language validity assessment.

Table 9. Language validity results of the *Tri Kaya Parisudha*-oriented IPAS supplement book

No	Aspect	Aiken's V Index	Category
1	Simplicity and clarity of language	0.97	Highly Valid
2	Communicative and accessible tone	1.00	Highly Valid
3	Dialogic and interactive language style	1.00	Highly Valid
4	Developmental appropriateness for Grade IV students	1.00	Highly Valid
5	Adherence to Indonesian language conventions	0.88	Highly Valid

Language validity produced an average Aiken's V of 0.88. Validators confirmed that the language used in the supplement book was appropriately calibrated to the cognitive and emotional developmental stage of Grade IV students, in accordance with the operational-concrete stage of cognitive development (approximately 9–10 years). The dialogic and interactive tone of the student activities was particularly commended for fostering active knowledge construction, enabling students to function as knowledge discoverers rather than passive recipients. These findings align with established principles of learner-centered instructional design (Azizah & Alnashr, 2022; Nicky Nadila et al., 2023).

Nine experts in content, language, and media considered the validity results of the teachers' books and textbooks reviewed in these aspects worthy. The expert validation results are as follows.

The content aspect included textbooks; students' books and teachers' books have appropriate and accurate content based on learning achievements in Phase B of Grade IV of elementary school. The selection of topics, depth of materials, and structured learning steps refer to learning achievements (CP), learning objectives (TP), and learning flow objectives (ATP) in curriculum independence. The material presented supported the accurate selection of images, materials, and illustrations oriented to local Balinese culture, as well as learning activities aligned with the learning stages, using the *Tri Kaya Parisudha* cycle (*Manacika*, *Wacika*, *Kayika*). Textbook development is based on content materials and theories used as references for formulation and arrangement, taking into account the relationships among textbook components and compiling them systematically. The book, developed for students and teachers, aligns with the characteristics of science-oriented learning and local wisdom, *Tri Kaya Parisudha*. The student book includes activities that follow the *Tri Kaya Parisudha* study cycle. Through student activities in the student book, students can construct their own knowledge in accordance with the provided sub-material, so that they become inventors and owners of knowledge, not just users or memorizers of knowledge (Widana et al., 2023a). Likewise, the teacher's book includes learning achievements, learning activities, and discussion questions for students. The learning activity steps in the teacher's book help teachers implement learning and directly guide students to understand concepts by starting with problems that students solve in small groups. Regularity and systematic presentation make it easier for teachers to implement learning in class.

Aspect Language in teacher's books and textbooks: students described a straightforward, communicative, dialogic structure that aligns with Indonesian language rules and uses language appropriate to children's development. Use language like this; make this textbook give a message, have a motivating ability so that the material is easily understood by students, as well as present material with cognitive and emotional development levels for children. Use harmonious language that supports cognitive development so children can convey messages effectively and create a fun learning atmosphere (Widana et al., 2023b).

The media aspect describes that, overall, developed textbooks fulfil the conditions of eligibility as standardized national books, as seen from the size, cover design, and content design of textbooks in general. Media aspects play an important role in textbooks because a well-designed book gives readers (students) an impression of being interesting and helps them understand the material, thereby increasing their understanding.

Overall, third-dimensional validation confirms that the IPAS book supplement oriented to *Tri Kaya Parisudha* is a valid and appropriate learning resource. This book supplement integrates the three-phase cycle of *Tri Kaya Parisudha* learning into structured student activities. *Manacika* invites students to conduct critical inquiry to build knowledge independently, study evidence, and

formulate questions. Activities: Wacika guides students to express and share their thinking through structured discussion, peer presentations, and collaborative problem-solving. Wacika's activities invite students to conduct experiments and observations directly and to operationalize scientific methods through contextualized inquiry in a culturally appropriate way. Developing valid and appropriate textbooks will allow students to study independently, effectively, and systematically, so they can achieve learning objectives.

This learning cycle aligns with the findings of [Wardhani et al. \(2024\)](#), who demonstrated that Problem-Based Learning integrated with *Tri Kaya Parisudha* values significantly improved the character development of fifth-grade students. Similarly, [Suryawan et al. \(2024\)](#) reported that applying *Tri Kaya Parisudha*-based metaphorical thinking in elementary education substantially enhanced both critical thinking and creativity. These convergent findings support the theoretical proposition that *Tri Kaya Parisudha* provides a pedagogically coherent and culturally authentic framework for structuring IPAS learning activities.

Moreover, the validity outcomes of the present study corroborate a growing body of evidence documenting the effectiveness of locally grounded teaching materials [Hasanah et al. \(2019\)](#); [Suparya et al. \(2024\)](#); [Wiradnyana et al. \(2022\)](#), which demonstrates that locally contextualised science materials consistently achieve high validity ratings and are well received by both teachers and students. In the broader international literature, [Azizah & Alnashr \(2022\)](#); [Ayuning \(2022\)](#) systematically reviewed evidence for the integration of indigenous knowledge into science education across multiple countries, concluding that culturally embedded materials significantly improve student engagement and academic performance when they authentically reflect students' lived experiences ([Hikmah et al., 2025](#); [Sari & Kumalasani, 2025](#)).

The structure of the supplement book comprising an introduction, learning objectives, essential questions, topical content with cultural integration, student activity cycles, and literacy-oriented evaluation items reflects best practices in the design of standards-aligned instructional materials. The teacher book component, which achieved analogous validity scores (content $V = 0.92$; language $V = 0.86$; media $V = 0.88$), provides scaffolded guidance for teachers to implement the *Tri Kaya Parisudha* learning cycle in classroom contexts, thereby addressing the instructional competency gap identified in the preliminary observations.

Conclusion

This study successfully developed and validated a *Tri Kaya Parisudha*-oriented supplementary Integrated Science and Social Studies (IPAS) textbook for fourth-grade elementary students that is aligned with the objectives of Indonesia's *Merdeka Curriculum*. The findings indicate that the developed textbook meets content, media, and language validity requirements, demonstrating its feasibility as a culturally responsive learning resource for elementary education. Beyond producing a valid instructional product, this study contributes theoretically by extending the application of *Tri Kaya Parisudha* from a cultural and character education concept into a pedagogical framework that integrates cognitive, communicative, and experiential learning through the principles of *Manacika*, *Wacika*, and *Kayika*. This framework enriches culturally responsive teaching by providing a systematic approach to embedding local wisdom into IPAS teaching materials while supporting scientific literacy, critical thinking, and character development. From a practical perspective, the developed textbook provides teachers with an alternative learning resource that contextualises scientific concepts through Balinese local culture, thereby supporting meaningful learning and the implementation of the *Merdeka Curriculum*. Nevertheless, this study has several limitations. The product was evaluated only through expert validation and has not yet been tested for its practicality and effectiveness in classroom settings. In addition, the development was conducted within the

cultural context of Bali, limiting its generalizability to other regions with different local wisdom traditions. Future research should examine the practicality and effectiveness of the textbook through experimental or quasi-experimental studies and explore the adaptation of this pedagogical framework to other local cultural contexts in Indonesia.

Bibliography

- Antoninis, M., Alcott, B., Al Hadheri, S., April, D., Fouad Barakat, B., Barrios Rivera, M., Baskakova, Y., Barry, M., Bekkouche, Y., & Caro Vasquez, D. (2023). *Global education monitoring report 2023: Technology in education: A tool on whose terms?*
- Ayuning, N. K. (2022). Usaha maksimal penerapan model pembelajaran kuantum untuk meningkatkan kemampuan kognitif siswa kelompok B1 semester II tahun pelajaran 2018/2019 di TK Kumarasari VII Denpasar (Maximizing the implementation of the quantum learning model to enhance the cognitive abilities of Group B1 students (Semester II, 2018/2019 academic year) at TK Kumarasari VII Denpasar). *Indonesian Journal of Educational Development (IJED)*, 3(3), 428-437. <https://doi.org/10.5281/zenodo.7367662>
- Azizah, L., & Alnashr, M. S. (2022). Pengembangan bahan ajar tematik berbasis kearifan lokal guna meningkatkan hasil belajar kognitif siswa (The development of thematic teaching materials based on local wisdom to improve pupils' cognitive learning outcomes). *Dawuh Guru Jurnal Pendidikan Mi/Sd*, 2(1), 1–12. <https://doi.org/10.35878/guru.v2i1.340>
- Bulkani, B., Fatchurahman, M., Adella, H., & Setiawan, M. A. (2022). Development of animation learning media based on local wisdom to improve student learning outcomes in elementary schools. *International Journal of Instruction*, 15(1), 55–72. <https://doi.org/10.29333/iji.2022.1514a>
- Delimanugari, D., Nisa, A. F., Wahyuni, A. D., Umam, M. K., Tinggi, S., Islam, A., & Tamansiswa, U. S. (2026). *Local wisdom integration in elementary science learning: Its effect on students' scientific literacy*. 13(1), 134–151. <https://doi.org/10.32505/b1grks73>
- Dina Restiani, N. L., Margunayasa, I. G., & Arie Paramita, M. V. (2024). Improving scientific literacy of elementary school students through problem-based learning model with balinese local wisdom. *Jurnal Ilmiah Sekolah Dasar*, 7(4), 590–598. <https://doi.org/10.23887/jisd.v7i4.62080>
- Fajari, S. L. E. W., & Chumdari. (2021). Critical thinking skills and their impacts on elementary school students. *Malaysian Journal of Learning and Instruction*, 18(2), 161–187. <https://doi.org/10.32890/mjli2021.18.2.6>
- Gall, M. D., Gall, J. P., & Borg, W. R. (1983). *Educational research an introduction 3rd edition*. Pearson Education, USA.
- Gay, G. (2018). *Culturally Responsive teaching: Theory, research, and practice* (3rd ed.). Teachers College Press.
- Hasanah, J., Jamaludin, J., & Prayitno, G. H. (2019). Bahan ajar ipa berbasis inkuiri terstruktur untuk meningkatkan literasi sains peserta didik smp (Structured inquiry-based science teaching materials to improve science literacy among junior high school pupils). *Jurnal Pijar Mipa*. <https://doi.org/10.29303/jpm.v14i2.1254>
- Herman, H., & Muadin, A. (2023). Prosedur pengembangan kurikulum satuan pendidikan tingkat sd untuk peningkatan mutu pendidikan (Procedures for developing the curriculum in primary schools to improve the quality of education). *Journal of Instructional and Development Researches*, 3(3), 110–118. <https://doi.org/10.53621/jider.v3i3.227>
- Hikmah, N., Arsih, F., Azhar, M., & Razak, A. (2025). Uncovering the potential of ethnoscience in science learning to improve students' literacy: A systematic-literature review (2014–2024). *Jurnal Pendidikan IPA Indonesia*, 14(3). <https://doi.org/10.15294/jpii.v14i3.19591>
- Kemendikbudristek. (2022). *Capaian pembelajaran kurikulum merdeka (Learning outcomes of the merdeka curriculum)*. Jakarta. Kemendikbudristek.

- Nicky Nadila, N., Sripit Widiastuti, N., & Adin Fauzi, N. (2023). Pengembangan buku ajar ide pokok berbasis potensi lokal pantai tambakrejo menggunakan model scramble untuk siswa kelas iv sd (Development of a textbook on key concepts based on the local potential of tambakrejo beach, using the scramble model, for year 4 primary school pupils). *Madako Elementary School*, 2(2), 110–120. <https://doi.org/10.56630/mes.v2i2.207>
- Permatasari, A., Mulyasari, E., Hendriawan, D., Rokayah, E., & Bait, E. H. (2024). Analisis pengembangan kurikulum mikro mata pelajaran Ilmu Pengetahuan Alam dan Sosial (IPAS) pada implementasi Kurikulum Merdeka di sekolah dasar (An analysis of the development of the micro-curriculum for the Natural and Social Sciences (IPAS) subject in the implementation of the Merdeka Curriculum in primary schools). *Kalam Cendekia: Jurnal Ilmiah Kependidikan*, 13(2). <https://doi.org/https://doi.org/10.20961/jkc.v13i2.97805>
- Permendikbud Nomor 8 Tahun 2016. (2016). Peraturan menteri pendidikan dan kebudayaan nomor 8 tahun 2016 tentang buku yang digunakan oleh satuan pendidikan (Regulation of the minister of education and culture no. 8 of 2016 on textbooks used by educational institutions). *Resma*, 3(2), 13–22.
- Pisa, O. (2022). Results (Volume I): The state of learning and equity in education. 2023. URL <https://doi.org/10.1787/53f23881-En>, 4.
- Pratiwi, V. U., Andayani, Winarni, R., & Anindyarini, A. (2022). Digital storybook to transform character education of local wisdom figures for elementary school students. *Journal of Social Studies Education Research*, 13(4), 250–264. <https://doi.org/10.17499/jsse.1012>
- Purbarani, D. A., Dantes, N., & Adnyana, P. B. (2018). Pengaruh problem based learning berbantuan media audio visual terhadap kemampuan berpikir kritis dan hasil belajar ipa di sekolah dasar (The effect of problem-based learning supported by audio-visual media on critical thinking skills and science learning outcomes in primary schools). *PENDASI: Jurnal Pendidikan Dasar Indonesia*, 2(1), 24–34. <https://doi.org/https://doi.org/10.23887/jpdi.v2i1.2689>
- Rahayu, P., Subhiyanto, S., Adityarini, E., & Marzuki, M. (2024). Analisis kemampuan literasi digital dan berpikir kritis mahasiswa sebagai wujud quality education dalam mendukung Sustainable Development Goals (SDGs) (An analysis of students' digital literacy and critical thinking skills as an expression of quality education in support of the Sustainable Development Goals (SDGs). *Go Infotech: Jurnal Ilmiah STMIK AUB*, 30(2), 256–266.
- Rosa, F. O., Aththibby, A. R., Prasasti, A. R., Chomsun, S., & Prameswari, E. (2025). Integrating Lampung local wisdom into science education: Development and validation of a culturally responsive textbook to enhance physics learning outcomes. *Jurnal Pendidikan Fisika*, 13(3), 479–492.
- Rosyidah, F., Susantini, E., & Yuliani, Y. (2025). Local wisdom and STEM in science education to support sdg-4: A systematic review. *Jurnal Pendidikan IPA Indonesia*, 14(4). <https://doi.org/10.15294/jpii.v14i4.34450>
- Sanjayanti, N. P. A. H., Suastra, I. W., Suma, K., & Adnyana, P. B. (2022). Effectiveness of science learning model containing Balinese local wisdom in improving character and science literacy of junior high school students. *International Journal of Innovative Research and Scientific Studies*, 5(4), 332–342. <https://doi.org/10.53894/ijirss.v5i4.750>
- Sari, A. P., & Kumalasani, M. P. (2025). Integrating local culture into IPAS learning: A culturally responsive teaching approach in elementary school. *Primary: Jurnal Pendidikan Guru Sekolah Dasar*, 14(6), 941–956. <https://doi.org/10.33578/jpkip.v14i6.941-956>
- Shodik, A. (2021). Merdeka belajar: Menurut perspektif john dewey. *Seuneubok Lada: Jurnal Ilmu-Ilmu Sejarah, Sosial, Budaya Dan Pendidikan*, 8(02), 206–217.
- Suartama, I. K. (2016). Materi 4 evaluasi dan kriteria kualitas multimedia pembelajaran (Module 4: evaluation and quality criteria for multimedia learning materials). *Ubiquitous Learning Environment Based on Moodle Learning Management System, January 2016*, 1–17. <https://www.researchgate.net/publication/335541585%0AEvaluasi>

- Sugihartini, N., & Swisnandy, I. G. A. M. (2025). Augmented reality in computer systems integrated with project-based learning in vocational schools. *Indonesian Journal of Educational Development (IJED)*, 6(2), 465–478. <https://doi.org/10.59672/ijed.v6i2.5093>
- Sundari, S., & Fauziati, E. (2021). Implikasi teori belajar Bruner dalam model pembelajaran Kurikulum 2013 (The implications of Bruner's learning theory for the 2013 Curriculum's learning model). *Jurnal Papeda: Jurnal Publikasi Pendidikan Dasar*, 3(2), 128–136.
- Suparya, I. K., Suastra, I. W., Suma, K., & Putrayasa, I. B. (2024). Enhancing scientific literacy in primary education: A novel approach through culturally integrated science textbook development. *Pakistan Journal of Life and Social Sciences*, 22(1), 5170–5178. <https://doi.org/10.57239/PJLSS-2024-22.1.00380>
- Suparya, I. K., Wartayasa, I. K., & Ariyana, K. S. (2025). *Improving critical thinking ability of elementary school students in science learning through scientific learning model based on Tri Kaya Parisudha*. 9(2), 220–229. <https://doi.org/https://doi.org/10.23887/jisd.v9i2.91818>
- Suryanti, S., Mariana, N., Yermiandhoko, Y., & Widodo, W. (2020). *Local wisdom- based teaching material for enhancing primary students ' scientific literacy skill*. 8(1), 96–105. <https://doi.org/10.21831/jpe.v8i1.32898>
- Suryawan, I. K. A. S., Astawan, I. G., & Trisna, G. A. P. S. (2024). Enhancing critical thinking and creativity: The impact of Tri Kaya Parisudha-based metaphorical thinking in elementary education. *Jurnal Penelitian Pendidikan IPA*, 10(3), 1245–1254. <https://doi.org/10.29303/jppipa.v10i3.5891>
- Susiani, K., Suranata, K., Sukawijana, I. K. G., & Ardana, I. W. (2025). Assessing the effectiveness of a tri pramana oriented experiential learning model in enhancing critical thinking skills: A rasch analysis in primary science education. *Jurnal Konseling Dan Pendidikan*, 13(4), 397–405. <https://doi.org/10.29210/1138400>
- Sutanto, T., Akhsan, H., & Kistiono, K. (2026). Integrating local wisdom in science: Development and validation of ethnoscience teaching modules for improving science literacy of junior high school students. *Integrated Science Education Journal*, 7(1), 148–155.
- Wardhani, N., Mahendradhani, G., & Wiradnyana, I. G. A. (2024). The impact of the problem-based learning model by Tri Kaya Parisudha on primary school students' character. *International Journal of Education Research and Development*, 4(2), 93–102. <https://doi.org/10.52760/ijerd.v4i2.73>
- Widana, I. W., Sumandya, I. W., Citrawan, I. W., Widana, I. N. S., Ibarra, F. P., Quicho, R. F., Delos Santos, M. R. H. M., Velasquez-Fajanela, J. V., & Mukminin, A. (2023a). The effect of teachers' responsibility and understanding of the local wisdom concept on teachers' autonomy in developing evaluation of learning based on local wisdom in a special needs school. *Journal of Higher Education Theory and Practice*, 23(10), 152-167. <https://doi.org/10.33423/jhetp.v23i10.6189>
- Widana, I. W., Sumandya, I. W., Citrawan, I. W. (2023b). The special education teachers' ability to develop an integrated learning evaluation of Pancasila student profiles based on local wisdom for special needs students in Indonesia. *Kasetsart Journal of Social Sciences*, 44(2), 527–536. <https://doi.org/10.34044/j.kjss.2023.44.2.23>
- Wiradnyana, I. G. A., Pramana, K. A. B. A., & Purandina, I. P. Y. (2022). Development of Android e-modules in the form of flip books based on Balinese local wisdom. *Jurnal Kependidikan: Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran Dan Pembelajaran*, 8(4), 1004–1017. <https://doi.org/10.33394/jk.v8i4.6037>