



Analysis of Integrating Local Potential in Science Learning and its Effect on 21st Century Skills and Student Cultural Awareness: Literature Review

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Abstract: Integrating local potential in science learning is an effort to introduce culture to the younger generation by linking indigenous knowledge into scientific knowledge. This study focuses on examining research conducted in the past five years, specifically those published in SINTA 2 to 4, that delve into the integration of local potential in science learning. The research employs a qualitative approach, utilizing a literature review of 30 articles chosen based on their classification, which explores the fusion of local potential and the unique culinary traditions of a region in science education. The results of the papers are in the form of classification for educational research in the fields of science, physics, chemistry, and biology. The results of the analysis show that the integration of local potential in science learning is combined with learning models and methods such as STEAM, Inkuriri, Discovery Learning, using PBL and PJBL models. Integration of local potential in science learning can improve 21st century skills including learning outcomes, concept understanding, critical thinking skills, problem solving skills, environmental literacy and students' love for local culture and problem-solving skills. The most significant results are learning outcomes and understanding of student concepts.

Keywords: Cultural awareness; Integration of local potential; Science learning; 21st century skills

Introduction

The independent curriculum is the latest curriculum implemented by the Ministry of Education and Culture (Lidiawati et al., 2023). The implementation of the independent curriculum starts from elementary school to university levels, including for secondary school levels such as junior high school (Vhalery et al., 2022). The implementation of an independent curriculum at this time offers students to learn according to their needs, known as the concept of differentiation based on student potential and adapted to the context of local content. The characteristic of the independent curriculum is the realization of the contextualization of

essential material by linking in everyday life (Lidi et al., 2022).

Another characteristic of the independent curriculum is the project to strengthen the Pancasila student profile (P5), one of which is global diversity. One of the key elements of global diversity is recognizing and appreciating culture (Kemendikbud, 2022). Cultural values must be instilled in society, so that they can provide a filter against global issues. Cultural inheritance to the younger generation can be implemented through education as a role in the cultural transformation process. Education must be able to adapt to technological developments and bring cultural values in it (Hamdani et al., 2021). Awareness of the importance of local culture as a national identity is needed for

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today's young generation (Harianto et al., 2023). Ideally, every citizen should be actively involved in preserving culture as the nation's identity. Local wisdom has the meaning of knowledge that exists in a community in providing solutions to problems properly and correctly that are relevant to community values in a particular environment (Ismadi, 2013). The use of local wisdom in solving problems is adjusted to the local genius of the local community and does not conflict with existing legal norms (Rohayu & Absori, 2019). The use of learning approaches that rely on local potential is still less common in educational contexts, although it has been recognized that the incorporation of local potential in learning can lead to ease for students in understanding the subject matter as they can observe specific objects or phenomena directly (Manalu & Suhartini, 2023).

The application of local wisdom-based science learning can improve student character and active student involvement in the learning process, so that students are given the opportunity to develop their competencies (Usmeldi & Amini, 2020). The delivery of information in the current era can be through interactive media that is increasingly developing, so that it is able to combine and combine graphics, sound, video, animation, and text. Indonesian culture can be conveyed through interactive animation applications to make it more interesting and easier to understand (Wulandari et al., 2023). Integrating local potential promotes cultural awareness and respect for diverse perspectives, thus fostering a more inclusive learning environment.

Global education systems are invited to strengthen structures that highlight the importance of skills, knowledge and attitudes essential for success in the 21st century (Martinez, 2022). By utilizing skills relevant to 21st century skills, students can increase their capacity to face the demands of the times. Thus, an appropriate learning approach is needed to reinforce these era-relevant skills (Fitria et al., 2023).

One of the most important goals of science education is the development of science literacy (Dragoş & Mih, 2015). The development of teaching materials, learning media and the integration of local potential are also needed to meet the needs of students in 21st century skills, one of which is science literacy. Science literacy is part of the 21st century skills that students must master in order to keep up with the global flow. Literacy skills are needed in solving global challenges appropriately to solve problems, make decisions, and understand natural and social events. Science literacy skills act as a basis or reference in education (Nirmalasari et al., 2021). The improvement of science literacy skills in young people is considered significant in some countries (Bórquez, Sánchez, 2024).

This research was conducted by reviewing the local potential integrated in science learning. Focus on the

integration of local knowledge in science learning, enriching curriculum content with local cultural aspects. Highlighting the importance of developing 21st century skills such as critical thinking, which is a key aspect of science literacy-based science learning. Examining the impact of local potential integration in science learning on the development of 21st century skills such as critical thinking, problem solving and creativity. Explore how the integration of local knowledge in the curriculum can enhance students' understanding of their cultural heritage. Contextuality and cultural awareness can be trained through the integration of science learning with local potential. This research aims to find out how much the implication of local potential in science learning and its impact on students' 21st century skills and cultural awareness.

Method

This research is a systematic literature review by selecting previous studies related to the field of integrating local potential in science learning and its influence on 21st century skills and cultural awareness. Identification of relevant studies involved a systematic search for articles in Sinta 2 to 4 with the keyword integrating local potential in science learning with a total of 30 articles. The purpose of this systematic literature analysis is to review and understand the integration of local wisdom in PBL-based science learning implemented in Indonesia and its influence on the skills required in the 21st century as well as to foster students' cultural.

Table 1. Article Criteria

Publication type	Article published in local
Keywords	Integration of local wisdom journal in science learning
Journal Specifications	Sinta 2-4
Year Published	2018-2023
Reserach Country	Indonesia
Field	Science, Physics, Chemistry, Biology

The selection of relevance studies to be included in this review was necessary to provide criteria used to identify relevant and appropriate articles for inclusion in this study. The criteria are as follows: The first, articles published in Sinta 2 to 4 from 2018-2023. The second, research that utilizes local wisdom in formal education. The Third, integration of local wisdom in science learning can facilitate 21st century skills for students 3. Based on the classification of this review, 30 articles were obtained with details in Table 2.

Table 2. Details of the Article

Index	Journal Name	Keywords	Facilitate
Sinta 2	Journal Study Education Sains	Local wisdom, science e-books, POE, STEAM, students' love for local culture	Students' love for local culture can be facilitated with a high category of 52.5%.
Sinta 4	PENDIPA Journal of Science Education	Local wisdom, problem-based learning, learning outcomes, learning implementation, student response	Improving student learning outcomes with moderate category
Sinta 3	Bioscientist: Scientific Journal of Biology	Local potential, critical thinking skills, and environmental awareness	Improve students' critical thinking skills and environmental awareness
Sinta 4	Journal of Integrated Science	Problem Based Learning, science learning outcomes, local wisdom	Improving science learning outcomes
Sinta 2	JPP UNDIKSHA	PBL, Local Wisdom, Social attitudes, Critical Thinking, Attitude	PBL model based on local wisdom improves students' social attitudes and critical thinking
Sinta 4	UNG Physics Journal (Jambura Physics Journal)	<i>Local Wisdom, Science Proses Skill</i>	Improve students' science process skills
Sinta 4	Journal Of Banua Science Education	Learning Outcomes, Local Wisdom, dan Science Learning Materials	Improving Students' Cognitive Learning Outcomes
Sinta 2	Journal of Education and Culture	Local potential, science content, 4C competencies	Improve 4C competencies to face 21st century challenges
Sinta 2	Indonesian Journal of Science Education	Nested models, Phinisi boat local wisdom, communication skills, conceptual knowledge	Improve communication skills and conceptual knowledge
Sinta 3	ELSE (Elementary School Education Journal)	Science learning model based on local kerafian, creativity, learning outcomes	Improve student creativity and learning outcomes
Sinta 3	Scientific Journal of Education and Learning	White Ox Ecotourism, Local Wisdom	Creating a more meaningful learning process
Sinta 4	Journal of Technology Research and Educational Innovation	Critical thinking skills, problem based learning, local wisdom	Improve critical thinking skills
Sinta 3	KASUARI: Physics Education Journal (KPEJ)	PBL model, local wisdom, learning achievement, and critical thinking skills	Improving learning achievement in terms of critical thinking skills
Sinta 2	Journal of Science Education Innovation	Science web-LKPD, local potential, curiosity, science web student worksheet, local potential, curiosity, sugar factory	Increase student curiosity
Sinta 2	Journal of Science Education Innovation	Local potential module, SETS, Science process skills	Improving students' science process skills at school
Sinta 2	Journal of Science Education Innovation	LKPD, PJBL, Local Potential, Concept Understanding, creative thinking	Improve concept understanding and creative thinking
Sinta 3	Journal of Research and Assessment of Educational Sciences: e-Science	21st century, biology learning, local potential, senior high school	Improve students' concept understanding
Sinta 2	Journal of Science Education Innovation	Local potential module, SETS, science process skills	Improving science process skills
Sinta 3	Journal of Physics Learning Research	e-modul, fire, problem based learning	Improve students' knowledge competency
Sinta 2	Indonesian Journal of Science Education	Learning resources, local potential, dadiah, Minangkabau, fermentation, science process skills	Improve students' science process skills
Sinta 3	Scientific Journal of Mathematics Education	Contextual Teaching Learning, Local excellences, problem solving	Improve students' problem-solving skills
Sinta 2	Journal of Science Education Innovation	LKPD, 7E learning cycle, local potential, critical thinking, local potential	Improve students' critical thinking

Index	Journal Name	Keywords	Facilitate
Sinta 2	Journal of Science Education Innovation	Science learning, Discovery Learning, local snacks, science process skills	Improve students' science process skills
Sinta 4	Journal of Basic Education	Flipbook, Dolanan Lokal, reading literacy	Improve students' reading literacy
Sinta 4	Pancasakti Science Education Journal	Pancasakti Science Education Journal Local wisdom, science literacy, content knowledge	Improving Science Content Knowledge
Sinta 3	Scientific Journal of Biology	Inquiry Worksheet, Local Wisdom, Critical Thinking Skills	Improve students' critical thinking skills
Sinta 3	Journal of Science education Research	Jigsaw, Local Wisdom, Cognitive Leranig Outcomes	Improve students' cognitive learning outcomes in learning
Sinta 2	Journal of Science Education Research	Scientific attitude, Electronik textbooks, Local Wisdom	Improving students' scientific attitude
Sinta 2	Indonesian Journal of Science Education	Local Wisdom, Jungle People, teaching materials, environmental	Improving Students' Environmental Literacy
Sinta 3	Scientific Journal of Biology	Critical thinking, local wisdom	Improve students' critical thinking skills

Based on the table above, it can also be seen that research on integrating local potential in science learning to improve 21st century skills was mostly carried out in 2020 and 2021. The fewest journal articles were published in 2018 as many as 1 article, in 2019 as many as 5 articles, in 2020 as many as 9 articles, 2021 as many as 6 articles, and 2022 as many as 4 articles, and 2023 as many as 5 articles. The dominant plaining that there is relevance to the literature study is in 2020 related to local potential-based learning.

Result and Discussion

Science learning integrated with local wisdom has the opportunity to train students to observe and experiment independently. Students become aware of the potential in their area, adaptive to seek, process, and find information to solve problems in their environment (Wilujeng & Prasetyo, 2017). Local wisdom in an anthropological perspective is also called local knowledge or local intelligence and is used as a reference for cultural identity. Generally, Local Wisdom is interpreted as local ideas that have the nature of wisdom, good value, and wisdom and the community follows these ideas. Local wisdom generally provides a perspective on a specific phenomenon that will characterize a group in society (Sudarmin, 2014). The process of reconstructing the community's original knowledge into scientific knowledge. This activity can be used to minimize misconceptions that occur in society. Anatra culture or local wisdom with science learning is closely related and can be used as a learning object in education. Application in the process of introducing local wisdom in formal education can be the right media because formal education itself is a forum for socializing good values (Syaputra, 2019). In addition,

to introduce the younger generation to local culture can be done with ethnoscience-integrated science learning (Damayanti et al., 2017). This is one of the teacher's efforts in providing opportunities for students to apply the concepts of material learned in the classroom with real-life phenomena, so that students learn to be more meaningful and understand well (Mantaka et al., 2017).

In science learning that is integrated in the teaching and learning process, much is done in the field of science itself, physics, chemistry, and biology. In this case study, the percentage of dominant natural science fields of study in local potential research to improve 21st century skills in the 30 articles above can be seen in the figure 1.

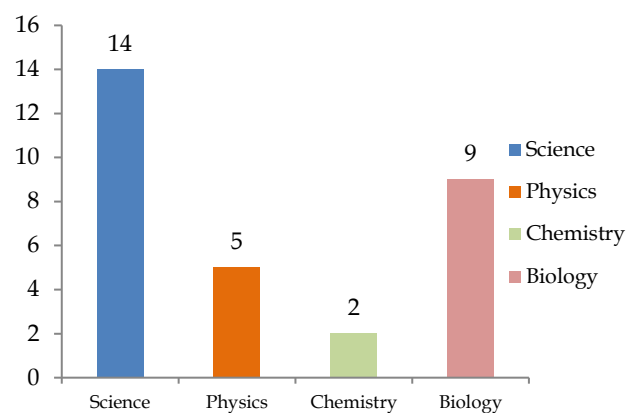


Figure 1. Research field graph of science learning integrated with local wisdom

Based on the table, it can be seen that in the field of science relevant research as many as 14 articles, physics 5 articles, chemistry as many as 2 articles and biology as many as 9 articles. The fields of science and biology have the largest percentage because in everyday life a lot is related and contains science or physics knowledge both

conceptually, both local potential culture and local wisdom.

The type of research used to analyze local potential integrated science learning uses different methods, some are quantitative and qualitative. Of the 30 articles that use the 4D method (Define, Design, Develop, and Disseminate) the percentage is 20% because in general using R&D research, researchers develop many learning resources and learning media such as electronic books, LKPD, teaching modules, and learning tools. Another R&D model is the ADDIE model with a percentage of

50% with many developing teaching materials, teaching modules, and digital books. In quantitative research, many use pre-experimental designs with pseudo-experimental research types. Generally, the objects of research are elementary, junior high, high school, and university students. Objects of Local Wisdom in Science Learning and its Influence on the 21st Century.

Based on the analysis of journals that show the object of local wisdom related to science learning can be seen in Table 3.

Table 3. Object of Local Wisdom Related to Science Learning

Category	Related objects
Local wisdom from the surrounding culture	Gamelan, farmer and rancher habits, Wonosalam Forest Heart Ecotourism, Jatimalang Beach, Phinisi Boat, White ox Ecotourism, Mount Ijen, Nunukan Kalimantan, Fire disaster, Dadiah, Parangritis Beach, Onion farming, Lelakaq, jungle people,
Local food	Cane sugar, local snacks, salt

Based on the table above, the dominant researchers integrate science learning with local wisdom or surrounding culture and local food that has certain characteristics. Based on the results of the analysis of 30 journals, the most dominant is the local wisdom found in the surrounding environment which is a source of learning to reconstruct original knowledge into scientific knowledge. One of the cultures that is very strong in the Yogyakarta area is gamelan. The connection between gamelan and physical material is the source of sound. When tapping on the gamelan, it will produce a variety of different sounds or tones. This is influenced by the size of the hole in the gamelan which affects the frequency of the sound. This integration of gamelan local wisdom can facilitate students' increasing love for culture.

Local potential found in the real world, for example in agriculture and animal husbandry, can encourage practical applications in learning and can be linked to environmental materials (Rahmi et al., 2023). In addition, tourist attractions can also be associated with learning, namely learning biology. Tourism Permata Hati Wonosalam Forest located in jombang district can be integrated with learning and can instill values that can be internalized in students in the form of environmental care values and this makes students' concept understanding higher which is indicated by higher student learning outcomes. Ecotourism of wonosalam forest day can support conservation attitudes, resources and biodiversity, for example hornbills and local plants (Sugiharti, 2022). Prangritis is also one of the tourist attractions related to physics, namely the concepts of solid pressure, liquid pressure, and gas pressure (Pertiwi & Firdausi, 2019). Not only in terms of culture, in terms of community agriculture can

also be used as a learning resource, one of which is shallot farming which is related to science learning material (Umam, 2020). Lelakaq local culture which is related to the concept of biology material on the interaction of biotic and abiotic components in the ecosystem (Hunaepi et al., 2020). The local potential of the jungle people is related to the concept of biological material that can be related to sound and biodiversity material (Sriyati et al., 2022).

Food production in each of its steps can also be linked to scientific concepts. Salt is one of the foods consumed by many people and the most is Madurese salt. Salt in the marinating process can be related to physical changes, changes in energy forms, substances and their changes, and separation of mixtures (Afifah et al., 2022).

In addition to being related to local wisdom in the local area, there is also a link between local food in an area and science learning concepts, namely the local potential of sugar factories related to environmental pollution, through this integration students become more interested and enthusiastic in learning science and encourage students to recognize local keraifna in Jombang (Fuadati & Wilujeng, 2019). Traditional snacks in the Cangkringan area are related to science content and are associated during practicum activities so that students understand the concept of material better (Tyas et al., 2020). Based on the above description, it can be concluded that local wisdom can be done through the incorporation of culture, special foods, and local environmental wisdom. To conduct research related to the relationship between local wisdom that will be integrated with science learning content must be really considered so that there is appropriate relevance to student knowledge. Integration of local wisdom in

science learning can be done independently or integrated with other models or approaches. Of the 30 articles there are some details of the integration of wisdom in learning that is integrated with other methods and models show to Table 4.

Table 4. Categorization of Local Potential Integrated in Science Learning Using Methods and Models

Category	Percentage (%)
Integration of local wisdom in learning	73.3
STEAM-based local wisdom learning	3.33
PBL-based local wisdom learning	13.33
PJBL-based local wisdom learning	3.33
Inquiry-oriented local wisdom learning	3.33
Local wisdom learning with Discovery Learning approach	3.33

Integration of local wisdom in science learning with various local wisdom and potentials such as jatimalang beach, dance, lompong cake, clorot, and waterfalls connected to basic competencies in elementary school students can improve students' 4C skills, namely communication, collaboration, critical thinking and creative thinking (Saptaningrum & Pritasari, 2023). Learning local wisdom associated with STEAM can address cognitive, manipulative, design and technology utilization skills and can facilitate a love of culture (Setianingrum et al., 2023). STEAM applied by teachers can facilitate students to think critically and solve problems (Haderiah et al., 2022). Research conducted by Kim et al. (2016) on the Development and Implementation of STEAM Programs Based on Traditional Korean Culture students can develop a strong understanding of scientific principles as well as develop creativity and utilize their emotions by exploring the beauty of traditional Korean culture, as seen in danso culture.

Learning combined with contextual content is easier to implement with the surrounding environment because the process of thinking critically in solving a problem using this model is easy to implement if the material given to students is close to the real life of students. The PBL model prioritizes real-world

problems as a context for students to think critically in solving problems (Budiarti & Airlanda, 2019; Syahidi et al., 2020). PBL is a learning concept that can help teachers to build learning environment conditions that start from problems so as to provide opportunities for students to get real learning experiences. The PBL learning process will involve students to be active, can work together, student-centered so that students' problem solving skills become more improved. PBL has three characteristics, first, in its application there are a series of activities that must be carried out by students including communicating, searching and processing data to conclude. Second, the learning activities will be directed to solve problems. Third, the approach used is scientific thinking to solve problems (Sofyan et al., 2017).

Project Based Learning (PJBL) integrated with science learning will involve students in project activities that are considered capable of facilitating in encouraging students to solve problems that exist in society and the environment in accordance with local wisdom (Tamimiya & Suryadarma, 2019). In addition, local wisdom can be integrated with the discovery learning approach and model to provide learning needs in the cognitive, affective, and psychomotor domains of students so that students gain in-depth knowledge. Through discovery learning students can be given the opportunity to progress and develop according to their individual abilities (Tyas et al., 2020).

Integrating local wisdom in science learning based on inquiry, students can explore and connect between concepts with everyday life and concepts that have been learned so that learning is more meaningful (Hunaepi et al., 2020).

21st Century Skills that are Influenced by Integrating Local Wisdom in Science Learning

Local wisdom has a role for 21st century skills. The following is a description of the variables influenced by the integration of local wisdom in science learning based on the results of the review of the 30 articles above which can be seen in Figure 2.

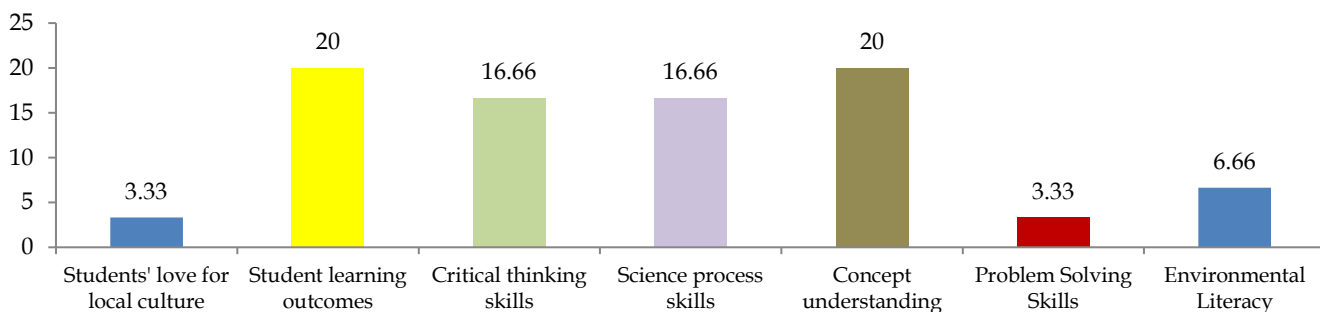


Figure 2. variables influenced by the integration of local wisdom in science learning

Based on the graph above, the variables that are widely used and have an influence on 21st century skills are learning outcomes and concept understanding with a percentage of 20%. Then continued with critical thinking skills and problem solving skills with a percentage of 16.66% in each variable. Next is environmental literacy with a percentage of 6.66% and the last is students' love for local culture and problem solving skills with a category of 3.33% in each variable. The highest variable is the effect on learning outcomes and concept understanding.

Learning Outcomes

Local wisdom integrated in science learning students not only learn only the extent of knowledge but experience science learning directly authentically and meaningfully, so that students are involved in the thinking process so that they can construct their own knowledge (Khaerani et al., 2020). Implementation of science learning based on local wisdom, students can be actively involved in discussion activities, cooperation in groups, student enthusiasm is also very high. Students' knowledge and skills in participating in community activities related to local potential can make students' cognitive abilities higher (Saputri & Desstya, 2023).

Concept Understanding

Students through integrating local wisdom can help students solve problems according to the real context in society and learning resources that are often found in the surrounding area make students more interested and the material learned is more meaningful (Arrozaqu & Setiawan, 2022). Integrated learning with local potential in its implementation can provide more opportunities for students to express their knowledge and ideas and not only have an impact on strengthening students' concepts but also teachers (Andi & Suryadarma, 2021). Through local potential, students are required to think creatively to find solutions to problems (Tamimiya & Suryadarma, 2019). Research conducted by Zidny et al. (2020) on integrating perspectives from indigenous knowledge and western science in chemistry learning shows that students give a positive response in learning on the topic of the use of pesticides by considering the learning carried out in accordance with the events experienced by students and learning becomes more interesting.

Critical Thinking Ability

In learning, students are emphasized to re-explore the knowledge they have gained related to the concept of knowledge that is in accordance with everyday problems. Students are given the freedom to develop creativity and students' critical thinking skills to be maximized (Soraya et al., 2019). A learning approach

grounded in indigenous knowledge has the potential to enhance students' critical thinking abilities to the fullest extent (Budiarti & Airlanda, 2019). There is a significant difference based on the effectiveness of using local wisdom in improving critical thinking skills, as well as a significant impact on students' critical thinking skills between the guidance model based on local wisdom and the guided inquiry model (Mulatsih et al., 2023).

Science Process Skills

Students' science process skills improve when local potential is applied in the classroom, therefore local wisdom-based learning can improve students' science process skills because it can help students in the learning process to help students understand the learning taught (Hayati et al., 2019). Local wisdom combined with discovery learning is able to facilitate the cognitive, affective, and psychomotor domains, students can gain in-depth knowledge in the learning process so that students' science process skills increase (Tyas et al., 2020). Research conducted by Asbanu et al. (2017) on the development of *Audacity-based* learning media sound waves using an ethnoscience approach shows that students' science process skills have improved with students' science process skills before and after the application of ethnoscience-based learning media sound waves of the Amanuban tribe show a significant difference, this is indicated by the average *posttest* value of students' science process skills higher than the average *pretest* value. The application of STEM by integrating local wisdom aims to improve science process skills in the modern era and get positive responses from students. They felt they understood the material better, were more motivated, and had an increased interest in learning. This approach is considered more effective as it allows students to explore their own identity based on their culture and surroundings, thus facilitating understanding of the subject matter (Mukaromah et al., 2022).

Problem Solving Skills

Implementing local wisdom in science learning, students are able to be able to compile solution steps in understanding the commands and instructions contained in the problem well so that students' problem solving becomes more improved (Kusumasari et al., 2020). The electronic Learner Worksheet that uses a problem approach and is connected to the local resources of TPST Piyungan in the topic of environmental change, is said to motivate students to actively seek their own knowledge in accordance with the steps of problem-based learning. It is also considered effective in improving students' ability to solve problems and increase environmental literacy in grade X SMA (Yunitasari & Pratama, 2024).

Environmental Literacy

Teaching materials based on local wisdom can introduce students to the reality of knowledge found in their environment, so that a sense of love for the environment can also be instilled in students (Sriyati et al., 2022). The use of local resources from the Citarum River in biology learning can improve students' understanding of the environment or increase students' environmental literacy (Khairani et al., 2023). The use of STEM Student Worksheets Integrated with the Local Potential of Pagar Alam Tea Plantation can improve environmental literacy skills, so that in the science learning process, local potential in each region can be optimally utilized (Wahyuni et al., 2022).

Love for Local Culture

Setianingrum and colleagues (2023) conducted research on science education using STEAM-POE-based Gamelan Local Content to foster students' appreciation for local culture. The use of developed media sparks students' interest in learning, leading to the successful cultivation of their love for local culture through science e-books infused with the wisdom of STEAM-POE-based gamelan. Recognizing the significance of cultural awareness in navigating the intricacies of cultural issues, the study underscores the importance of early cultivation of this awareness, particularly within the school environment. Cultural awareness, as emphasized by Setiawan et al. (2017), involves understanding and adopting a perspective that acknowledges the influence of culture on human values and behavior.

According to the Curriculum Standards, cultural awareness includes five dimensions: cultural knowledge, cultural awareness, cultural attitudes, cultural character, and intercultural communicative competence (Zhang & Li, 2022). Wunderle in Fitri (2018) states that cultural awareness is the ability to recognize and understand the influence of culture on human values and behavior (Suriata, 2022). In general, this cultural perspective will be able to provide meaning and form a unique view or orientation towards people's lives in a worldview (Akharraz, 2021). The cultural diversity of the Sasak people is reflected in all aspects of their lives. With a formal education approach, students can gain a deep understanding of the subject matter while gaining a deeper understanding of their identity and environment. This can help in forming a sense of love for the homeland and the values of Pancasila. The integration of local wisdom into chemistry learning also has a positive impact in maintaining the existence of the local wisdom of the Sasak tribe and strengthening the character of students (Mashami et al., 2023).

Conclusion

Integration of local potential in science learning by integrating approaches and learning models that can be carried out in further research to determine its effect on students' science literacy and other skills that are the demands of the 21st century. Based on the literature review, it is known that the integration of local wisdom in science learning in various fields such as physics, chemistry, biology, and science. Local wisdom in the community that has its own characteristics and uniqueness both in culture, special foods, and eating culture can be used as a learning resource and the need for reconstruction of indigenous knowledge into scientific knowledge. In the process, integrating local wisdom in science learning and its impact on 21st century skills can be taught with various models and approaches in learning. Among them are based on the STEAM approach, Inkuriri, Discovery Learning, using PBL and PJBL models. And the integration of local potential combined with the most learning model is PBL-based local wisdom learning. Integration of local potential in science learning can improve several variables of 21st century skills including learning outcomes, concept understanding, critical thinking skills, problem solving skills, environmental literacy and students' love for local culture and problem solving skills. The most significant results are learning outcomes and understanding of student concepts.

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Author Contributions

The contributor to this paper has consistently and notably played a crucial role in advancing this study. They have consistently engaged in thorough research, gathering numerous journals, and meticulously analyzing and collecting data. Conceptualization, K.; methodology, K.; methodology, K.; formal analysis, K.; investigation, K. And J.; resources, I.W. and J.; writing-original draft preparation, K. and S.Y.U.; writing-review and editing, I.W and J.; visualization, K. And S.Y.U All authors have read and agreed to the published version of the manuscript.

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This research has no conflict of interest regarding the publication of this paper.

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