check for updates

Cultural and social context-based learning in natural sciences for the development of students' social responsibility in Vietnam

Nguyen Thi Thanh Phuong[1]

Do Huong Tra[2+]

Phung Viet Hai[3]

[1]*Tay Nguyen University, Dak Lak, Vietnam.*
Email: nttphuong@ttn.edu.vn
[2]*Hanoi National University of Education, Hanoi, Vietnam.*
Email: dhtra@hotmail.com
[3]*The University of Da Nang, University of Science and Education, Da Nang, Vietnam.*
Email: pvhai@ued.udn.vn

(+ Corresponding author)

ABSTRACT

This study investigates teachers' perceptions and practices concerning the integration of cultural and social contexts into teaching in Vietnam, with the aim of enhancing students' social responsibility. A comprehensive survey was conducted involving 1,281 students and 51 Natural Science teachers from secondary schools in the Central Highlands of Vietnam. The findings reveal that while teachers of natural sciences in this region are acutely aware of the significance of incorporating local cultural and social contexts into their instruction to foster students' social responsibility, its actual implementation is infrequent, primarily due to various challenges, including limited resources, time constraints, and a lack of training. Furthermore, the student survey results show no significant improvement in their social responsibility, suggesting that current teaching practices may not be effectively addressing this critical educational goal. In light of these findings, several recommendations are proposed, including the expansion of targeted training programs and ongoing support for teachers on how to effectively integrate cultural and social contexts into their teaching practices. The outcomes of this study offer valuable insights for educators in Vietnam, aiding them in designing more effective instructional activities for natural science subjects in alignment with the educational objectives outlined in the 2018 General Education Program.

Contribution/Originality: This study provides essential information for educators and policymakers by contributing to the broader discourse on educational reform and the importance of contextualized learning. The insights and recommendations offered by this research can aid in designing more effective teaching strategies that not only enhance academic outcomes but also foster social responsibility among students, thereby addressing both educational and social goals.

1. INTRODUCTION

In the context of globalization and the relentless advancement of science and technology, education extends beyond mere knowledge transmission to encompass the holistic development of students' personalities and social responsibilities (Bennett, 2003). This necessitates continuous innovation in both teaching methods and curriculum content to meet the demands of modern society and cultivate a generation capable of adapting to the ever-evolving

world (Malik, 2018). Particularly, the instruction of scientific subjects should be tailored to fit the cultural and social contexts of each nation (DeBoer, 2011).

The objective of this study is to examine the perceptions and practices of teachers in Vietnam concerning the integration of cultural and social contexts into the instruction of natural sciences and its impact on students' development of social responsibility. The study aims to provide recommendations for enhancing teaching quality to foster social responsibility among students.

Vietnam is a nation comprising over 54 ethnic groups, each with distinct cultural and linguistic characteristics, creating a rich multicultural society. Consequently, scientific education must be adapted to reflect these unique attributes, enabling students to not only comprehend scientific concepts but also apply them in everyday life (Acar & Yaman, 2011). If high school science subjects fail to connect with students' interests and real-life concerns, they risk becoming abstract and challenging to absorb (Millar, 1989). This disconnect can lead to a lack of motivation and a diminished appreciation for the value of learning. Therefore, it is crucial to establish a connection between the curriculum and practical issues relevant to students. Lessons should be designed to impart theoretical knowledge while demonstrating its practical applications, fostering responsible citizens capable of critical thinking and real-world problem solving, thereby contributing to sustainable development (Barthes, 2018; Venkatesan, 2021).

The educational objectives in Vietnam are outlined in five qualities and ten core competencies in the 2018 General Education Curriculum. Among these qualities, responsibility and social responsibility are emphasized (Ministry of Education and Training, 2008). However, effectively integrating scientific knowledge with cultural and social values to instill a sense of social responsibility in students is a significant challenge. This integration largely depends on teachers' awareness and application of cultural and social contexts in their teaching.

Numerous studies have shown that context-based learning (CBL) linked to cultural and social contexts significantly impacts the development of students' social responsibility (Acar & Yaman, 2011; Bennett, Lubben, & Hogarth, 2007; Peşman & Özdemir, 2012; Ültay & Çalık, 2012; Wilkinson, 1999). When acquiring scientific knowledge, students often question the relevance of the topics to real life, reflecting their tendency to view scientific knowledge as abstract and detached from daily experiences (Psillos, 2001).

Integrating cultural and social contexts into the instruction of natural sciences not only enhances students' grasp of scientific knowledge but also promotes the development of social responsibility, critical thinking skills, and the ability to apply knowledge practically. The questions that students pose about the real-life relevance of their studies underscore the importance of teaching that is closely connected to local contexts. This study, through an examination of teachers' perceptions and practices in Vietnam, aims to provide valuable insights for improving teaching methods. The findings offer specific recommendations to support teachers in creating engaging lessons that are closely linked to students' everyday lives.

2. THEORETICAL FRAMEWORK AND PREVIOUS STUDIES

2.1. Context and Origin of the Context

The word "context" is derived from the Latin word "contexere." As a verb, it means "to connect together," and as a noun, it means "cohesion," "connection," or "relationship." Thus, the function of "context" is to describe the circumstances that give meaning to words, phrases, and sentences. A context must provide a coherent structural meaning for something to be placed in a broader perspective. According to this understanding, "context" is a cultural entity in society that is temporal, spatial, and related to human activity (Gilbert, 2006). In many dictionaries, context refers to the circumstances or conditions surrounding a particular object or activity. However, there are some criticisms of the use of context to clarify the teaching process, such as who argued that context is meant as a contour, as the boundary of the content and the phenomenon in question. In other words, context means "something surrounding," and by relying on this sense we can determine the scales of interaction related to the

learning process. According to Hinton (2014) the context is a set of external factors that impact a particular object or action and may include space, time, culture, emotions, needs, or other technical factors.

Thus, there are many definitions of context, but in this research, context is defined as a fact, event, problem, or situation that contains scientific knowledge and can be built on and developed into lessons to help students form the necessary knowledge, skills, and attitudes.

One of the important issues of CBL is the need to determine the context appropriate to the learning content and the concerns of learners. The context is often described as a situation that helps students understand the meaning of concepts, rules, laws, etc. This definition can be extended to consider the context as practical problems that help students understand the meaning of activities in and out of school. However, it is still necessary to clearly identify the origin of the context. According to Jong (2008) the context may have four origins: Origin from the personal field; origin from the cultural and social field; origin from the professional field; and origin from science and technology. These origins are differentiated to clarify which context makes sense. Therefore, understanding and analyzing the origin of the context is important in the teaching process (Gilbert, McEwan, Matos, & Rivis, 2011). Teachers can use the context to choose appropriate teaching methods to support the transmission of knowledge, helping them to apply knowledge in practice effectively (Roberts & Ball, 2009).

In this study, we focus on the cultural and social based context. The cultural and social context is important because a school needs to prepare students to assume their role as responsible citizens by clarifying the role of natural science knowledge in cultural and social issues (Jamison & Mejlgaard, 2010).

2.2. Cultural and Social Context-Based Learning

There are many studies that provide viewpoints on CBL. From the perspective of contextualized education, as found in the documents on social constructivist education with pioneers such as John Dewey, an American pragmatist, and Lev Vygotsky, a Russian educational psychologist, scientists have used social constructivist theory to put the role of cognition top in the process of perceiving and respecting the environment and the context in which cognitive activity takes place (Jaramillo, 1996). According to constructivism, CBL is type of teaching in which learners are considered as active intellectual builders and where information is built based on problem-solving results. In phenomenon-based learning, the situation occurs in a collaborative environment and supports the social constructivism and socio-cultural learning theories of Albert Bandura (Vetter et al., 2022). In a constructivist educational environment, teachers not only impart knowledge but also guide and encourage students to explore, delve more deeply into the nature of the problem, and seek solutions in a creative and unique way. They create a space for students to discuss, exchange ideas, and learn from each other, thereby helping each student develop the ability to reason, analyze, and solve problems independently and creatively. Stinner (2006) emphasized that contextualized learning should be linked to constructivist doctrines.

According to Whitelegg and Parry (1999) CBL in the broad sense is the cultural and social environment in which students and teachers are. On a narrower scale, CBL focuses on a specific application of scientific knowledge that needs to be built and consolidated. According to Sutman and Bruce (1992) CBL is the process of teaching using the resources of real-world applications, such as solving relevant social problems, and discussions between teachers and students to encourage connections between concepts and contexts (Sutman & Bruce, 1992). Aikenhead (2006) stated that CBL focuses on the application of science as a means to improve scientific understanding of the real world and, at the same time, develop capacity for students. In Vietnam, according to Hang (2016), it is understood as the use of context to carry out activities in order to help achieve the objectives of scientific knowledge, skills, and attitudes set out for students, thereby developing students' capacities and personalities.

We can see that there are many different viewpoints on CBL, each with its own meaning for each research hypothesis and the factors affecting students' learning. In this study, the main learning contexts are those derived from culture and society as analyzed in section 2.1. Teaching in association with the cultural and social context is

the use of a particular fact, event, problem, or situation derived from cultural and social practices of the locality (where students live and study). They contain the content of scientific knowledge, which can be built on and developed into teaching situations, thereby implementing learning activities to help students achieve the objectives set.

2.3. Students' Social Responsibility and its Position in the Educational Objectives in the World and in Vietnam

2.3.1. Perspectives on Social Responsibility

Responsibility is often understood as the awareness of the results of one's activities and the ability to voluntarily perform their obligations. In other words, responsibility is the self-conscious performance of duties and obligations to others and society (Phuc, 2008). Responsibility is a multifaceted concept, encompassing three main aspects: attitude, competency, and belief (Berkowitz & Daniels, 1964; Conrad & Diane, 1985).

- Attitude: Evaluating whether an individual feels responsible and accountable for social issues. This implies awareness and self-responsibility in solving social issues, from identifying problems to taking action.
- Competency: An individual's capacity to use responsible behavior to solve problems. This includes the necessary knowledge, skills, and mindset to face societal challenges and develop solutions.
- Belief: Confidence that the behaviors taken to solve problems will make a difference. This reflects a sense of an individual's role in a changing society and belief in their abilities and actions (Scales, Blyth, Berkas, & Kielsmeier, 2000).

These perspectives on personal responsibility in addressing social issues align with the requirements for student "responsibility" outlined in Vietnam's 2018 General Education Program. This program emphasizes that responsibility is not merely a personality trait but is crucial to the development of other personal qualities and competencies. The cultivation of responsible individuals is essential for fostering a community characterized by positive transformations. We introduce the concept of "social responsibility" as follows: Students' social responsibility involves the process of awareness, commitment, and positive action to contribute to solving cultural and social problems in their locality. In this process, students must identify and understand the problem and show concern and commitment to participating in problem solving to find solutions. They need to equip themselves with the necessary skills and knowledge to effectively address problems. Finally, students must believe that their actions can create positive changes. This requires confidence in their abilities and the power of specific actions to promote positive change regarding cultural and social issues.

2.3.2. The Position of Social Responsibility in the Educational Objectives in the World and in Vietnam

Currently, sustainable development education is a new global education trend that requires citizens to have critical thinking and cooperation skills, participate and act based on the system of scientific knowledge, properly and profoundly identify risks, and find feasible solutions to solve problems that are and will threaten the existence and development of their locality, the country, and the world. In brief, developing responsible citizens is one of the goals of the world education movement (Barthes, 2018).

Vietnam's 2018 General Education Curriculum also includes responsibility as one of the five core qualities specified in the program's achievement requirements. The inclusion of responsibility not only emphasizes the importance of educating people on personal and social responsibility, but also reflects the orientation of the new education system to create responsible citizens who are willing to make positive contributions to the community and society.

This regulation is part of the comprehensive reform effort of the program, aiming to improve the quality of education and meet the country's development requirements in the context of international integration.

3. METHOD

3.1. Research Design

The descriptive analytical method is employed in this study to achieve a comprehensive understanding of the investigated phenomenon. This approach involves systematic investigation, surveys, and data analysis to precisely characterize the perceptions and practices of teachers in Vietnam concerning the integration of cultural and social contexts into Natural Sciences instruction and its effect on the development of students' social responsibility.

3.2. Research Population

The study employed convenient random sampling techniques and directly investigates 1,281 students from six secondary schools across five provinces in the Central Highlands region, along with 51 teachers of Natural Sciences from these schools. Given the distinctive characteristics of the Central Highlands' population, schools were randomly selected to include both Kinh and indigenous students. The localities where these students live and study face similar cultural and social challenges, such as noise pollution from bird nest farming, noise pollution from coffee grinders during the harvest season, and the extinction of traditional cultural musical instruments of the indigenous people. These issues were incorporated into the study's investigative content. The surveyed students had completed the 7th-grade program according to the 2018 General Education Curriculum and were about to enter the 8th-grade curriculum, with the knowledge from 7th-grade Natural Sciences being applicable to addressing the aforementioned cultural and social issues. The information of the students and teachers participating in the survey is presented in Table 1 and Table 2, respectively.

Table 1. Information of students participating in the survey.

School	N %	Ethnicity		
		Indigenous people in the Central Highlands	Ethnic group: Kinh	Others
Dak Buk So	299 100%	11.0 %	89%	0%
Ea Hnin	194 100%	39.2%	59.3%	1.5%
Phan Boi Chau	262 100%	41.6%	50.8%	7.6%
Vo Thi Sau	154 100%	59.1%	26%	14.9%
Dray Bhang	201 100%	12.4%	86.6%	1.0%
EaBhok	171 100%	98.8%	1.2%	0%

Table 2. Information of teachers participating in the survey.

School	N %	Working duration				Qualification	
		Less than 5 years	From 5 to less than 10 years	From 10 to less than 15 years	More than 15 years	University	Postgraduate
Dak Buk So	12 100%	16.66%	25%	41.68%	16.66%	66.67%	33.33%
EaHnin	8 100%	50%	25%	0%	25%	100%	0
Phan Boi Chau	10 100%	40%	30%	10%	20%	100%	0
Vo Thi Sau	6 100%	50%	50%	0	0	100%	0
Dray Bhang	8 100%	12.5%	37.5%	50%	0	62.5%	37.5%
EaBhok	7 100%	42.85%	0	57.14%	0	100%	0

3.3. Research Tool

For students, the study employed a questionnaire consisting of 10 questions designed to assess four key areas: (1) Students' motivation for learning Natural Sciences; (2) Students' awareness of local cultural and social issues and their perceived responsibilities regarding these issues; (3) Students' understanding of the "responsibility" quality as defined in Vietnam's 2018 General Education Curriculum; (4) Students' preferences and learning styles in Natural Sciences.

For teachers, a separate questionnaire was developed with eight questions focusing on: (1) Teachers' perspectives on integrating cultural and social contexts into the teaching process to enhance students' social responsibility; (2) The degree to which local cultural and social contexts are incorporated into teaching; (3) The stages of the teaching process at which teachers commonly integrate these contexts; (4) The challenges faced by teachers in applying context-based teaching methods in Natural Sciences. In-depth interviews were also conducted with several groups of teachers to provide additional insights and clarify the data obtained. The questionnaires for the students and the teachers are respectively presented in Appendix 1 and Appendix 2. The teacher interview questions are presented in Appendix 3.

3.4. Validity and Stability of the Tool

To ensure the validity and accuracy of the two questionnaires, they were evaluated by a panel of 17 experts, comprising educational consultants, teachers, and school principals. Adjustments were made based on the panel's feedback and recommendations, including the removal, addition, and modification of certain items.

Before the main survey, the questionnaires underwent a pre-test with 20 Natural Sciences teachers and 90 7th-grade students (not included in the study sample) from secondary schools in Dak Lak Province. The pre-test aimed to refine the language and phrasing to prevent ambiguity and ensure that the questions were clear to the respondents.

3.5. Data Analysis

The research participants gave their informed consent before completing the survey. The data gathered was analyzed using the Statistical Package for the Social Sciences (SPSS) version 26. SPSS is a widely utilized software specifically designed for statistical analysis. In this study, descriptive statistics techniques were employed to summarize the quantitative data collected. These techniques include various measures, such as mean, median, mode, standard deviation and range, to offer a clear understanding of the data's central tendency and variability. Consequently, descriptive statistics were used to provide a comprehensive summary of the data, representing the entire population under study. The survey results obtained from the teachers and students are presented in Table 3 and Table 4, respectively.

Table 3. Results of the teacher survey.

No.	Question		Answer options	N	Rate
1	According to you, does integrating the cultural and social contexts of the locality where students live and learn into the teaching process lead to the development of social responsibility for students?		No development	0	0%
			Less development	0	0%
			Relatively good development	15	29.4%
			Good development	36	70%
2	How often do you integrate social and cultural contexts (Where students live and study) into your lessons?		Never	3	5.9%
			Occasionally	15	29.4%
			Regularly	33	64.7%
3	Which stage of the teaching process do you often integrate cultural and social contexts into? (Multiple options can be selected)		Introduction	37	72.5%
			Form new knowledge	5	9.8%
			Practice/Application	9	17.6%
4	According to you,	The preparation and	Strongly disagree	0	0%

No.	Question		Answer options	N	Rate
	when teaching, what difficulties will you encounter that relate to the cultural and social context of the locality where students study and live (Integrating cultural and social contexts in all stages of the teaching process) in order to develop social responsibility in students?	implementation of teaching requires significant effort and time from both students and teachers.	Disagree	0	0%
			Agree	20	39.2%
			Strongly agree	31	60.8%
		The 2018 general education curriculum is suitable for integrating contexts associated with the culture and society of the locality.	Strongly disagree	3	5.9%
			Disagree	9	17.6%
			Agree	24	47.1%
			Strongly agree	15	29.4%
		It's difficult to select local contexts suitable for the lesson content.	Strongly disagree	14	27.5%
			Disagree	8	15.7%
			Agree	8	15.7%
			Strongly agree	21	41.2%
		Cultural and social CBL to develop social responsibility for students will affect their academic performance.	Strongly disagree	4	7.8%
			Disagree	5	9.8%
			Agree	18	35.3%
			Strongly agree	24	47.1%

3.6. Results

3.6.1. Results of the Teacher Survey

Regarding items 1, 2 and 3, all surveyed teachers (100%) agreed that integrating cultural and social contexts into the teaching process enhances students' development and social responsibility. However, only 64.7% of the teachers consistently implement this integration, primarily in four secondary schools: DrayBhang, Dak Buk So, Phan Boi Chau, and EaHnin. This indicates that, despite teachers' recognition of the importance of incorporating cultural and social contexts to foster social responsibility, implementation remains inconsistent. Specifically, 35.3% of teachers, particularly at EaBhok Secondary School and Vo Thi Sau Secondary School, either occasionally or never integrate these contexts. Figure 1 depicts the extent to which cultural and social contexts are integrated into the teaching processes across the six surveyed schools.
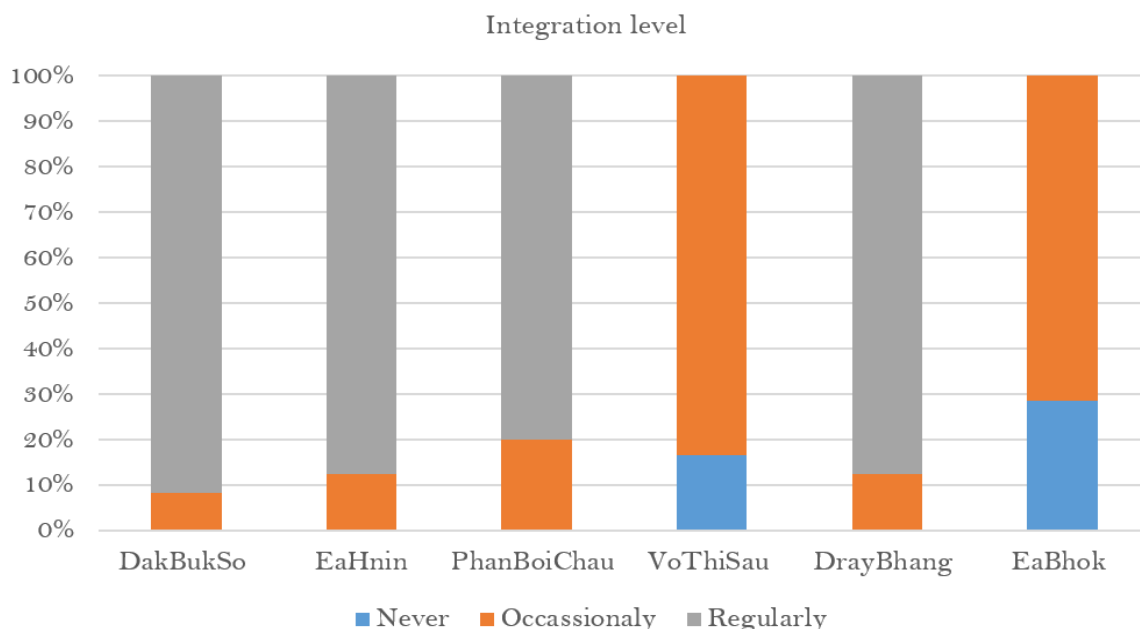

Figure 1. The level of integration of cultural and social contexts into the teaching process.

Teachers primarily integrate cultural and social contexts at the introduction phase of lessons (72.5%), with the practice/application phase receiving only 17.6% of this integration, and the new knowledge formation phase receiving minimal integration (9.8%). The interviews with the teachers revealed that they use cultural and social

contexts mainly to initiate lessons, connecting content with familiar contexts to engage and motivate students. However, during other phases, they predominantly adhere to the textbook content and contexts provided therein. Thus, the integration of cultural and social contexts in Natural Sciences teaching in the Central Highlands is largely limited to the introductory stage of lessons.

For item 4, the most commonly cited challenge by teachers when applying culturally and socially context-based learning to develop students' social responsibility was "The preparation and implementation of teaching requires significant effort and time from both students and teachers" (100%). Additionally, 76.5% of teachers agreed that the 2018 General Education Curriculum is suitable for integrating local cultural and social contexts to develop students' social responsibility. However, a majority of the teachers (82.4%) believe that such integration may negatively impact students' academic performance.

Furthermore, 56.8% of the teachers acknowledged that selecting appropriate local contexts for lessons is challenging. Notably, among the 43.2% who disagreed, most were teachers with over ten years of experience. Common difficulties reported by teachers include a lack of understanding and confusion in developing learning activities linked to cultural and social contexts for fostering social responsibility. Teachers expressed a need for clear methodological and procedural guidance. Additionally, teachers from EaBhok Secondary School and Vo Thi Sau Secondary School cited economic constraints and the cultural characteristics of their students, such as low family income and a high proportion of indigenous students, as significant barriers to applying culturally and socially relevant teaching methods. The in-depth interviews with the teachers from these two schools, as well as Phan Boi Chau Secondary School, further clarified these issues.

At EaBhok Secondary School and Vo Thi Sau Secondary School, which have a high percentage of ethnic minority students (see Table 1), the integration of socio-cultural contexts into teaching is rare. Teachers reported that, due to the high dropout rate and the challenging economic conditions of their students, they focus on maintaining student attendance rather than experimenting with innovative teaching methods. Concerns include the potential negative impact on students' time to assist family at home if they engage in more active or innovative learning approaches. Additionally, the use of the Ede language among students creates a significant barrier in teacher–student interactions.

In contrast, teachers at Phan Boi Chau Secondary School, which also has a high percentage of ethnic minority students (41.6%) and low household living conditions, regularly incorporate local cultural and social contexts into their teaching. Although the native language barrier is acknowledged, teachers at this school have undergone Ede language training, allowing them to communicate effectively with students and support the use of their native language in learning, thereby overcoming this barrier.

3.6.2. Results of the Student Survey

Table 4. Results of the student survey.

No.	Question	Answer options	N	Rate
1	What are your motivations for studying Natural Sciences? (Select up to 2 answers that are most important to you)	To achieve high results on the teacher assessment test	1121	87.5%
		To explain everyday phenomena	730	57%
		To apply the knowledge of the subject to solve cultural and social issues in my locality	45	3.5
		For other motives	0	0%
		No motivation, just because Natural Sciences is a compulsory subject	160	12.5%
	Which of the following issues are happening in your area?	Noise pollution from bird's nest households	665	51.9%
		The cultural extinction of the traditional musical instruments of the	740	57.8%

No.	Question		Answer options	N	Rate
2			indigenous people of the Central Highlands		
			The air pollution and noise from the grinders during the coffee harvest season	776	60.6%
			Do not know which of the 3 issues above	323	25.2%
	Choose the answer that best applies to you.	Some students are very worried about the negative impact of such issues on everyone living around them.	Not true for me	153	11.9%
			Sometimes true for me	911	71.1%
			Mostly true for me	115	9%
			Absolutely true for me	102	8%
		Some students look forward to participating in solving these problems.	Not true for me	370	28.9%
			Sometimes true for me	757	59.1%
			Mostly true for me	90	7.0%
			Absolutely true for me	64	5%
		Some students have enough knowledge and skills to solve these problems.	Not true for me	1170	91.3%
			Sometimes true for me	101	7.9%
			Mostly true for me	9	0.7%
			Absolutely true for me	1	0.1%
		Some students have faith that they will solve these problems well.	Not true for me	0	0%
			Sometimes true for me	1190	92.9%
			Mostly true for me	76	5.9%
			Absolutely true for me	15	1.2%
3	In the 2018 general education curriculum, the ministry of Education and Training stated "responsibility" as one of the five core qualities, which are essential for a student's growth and development in secondary school. Have you ever heard of it, and to what extent?		Level 1: Known and profoundly understood	38	3%
			Level 2: Often heard from teachers but not understood	244	19%
			Level 3: Heard of but can't remember	756	59%
			Level 4: Never heard of it	243	19%
4	What is your view of the following statements?	If you find that Natural Sciences knowledge is related to the practical issues happening around you, you will prefer to study.	Strongly agree	27	2.1%
			Agree	79	6.2%
			Disagree	637	49.7%
			Strongly disagree	538	42%
		You are very interested when the teacher gives you the opportunity to learn about and solve problems that are happening in his locality through learning tasks.	Strongly agree	23	1.8%
			Agree	81	6,3%
			Disagree	447	34.9%
			Strongly disagree	730	57%
		When you clearly understand the connection between the concept learned and the problems that are happening where you live, you will be more confident in solving them.	Strongly agree	58	4.5%
			Agree	165	12.9%
			Disagree	764	59.6
			Strongly disagree	294	23%

Item 1: Figure 2 illustrates the percentage of students from each school who selected their own learning motivations for studying Natural Sciences.
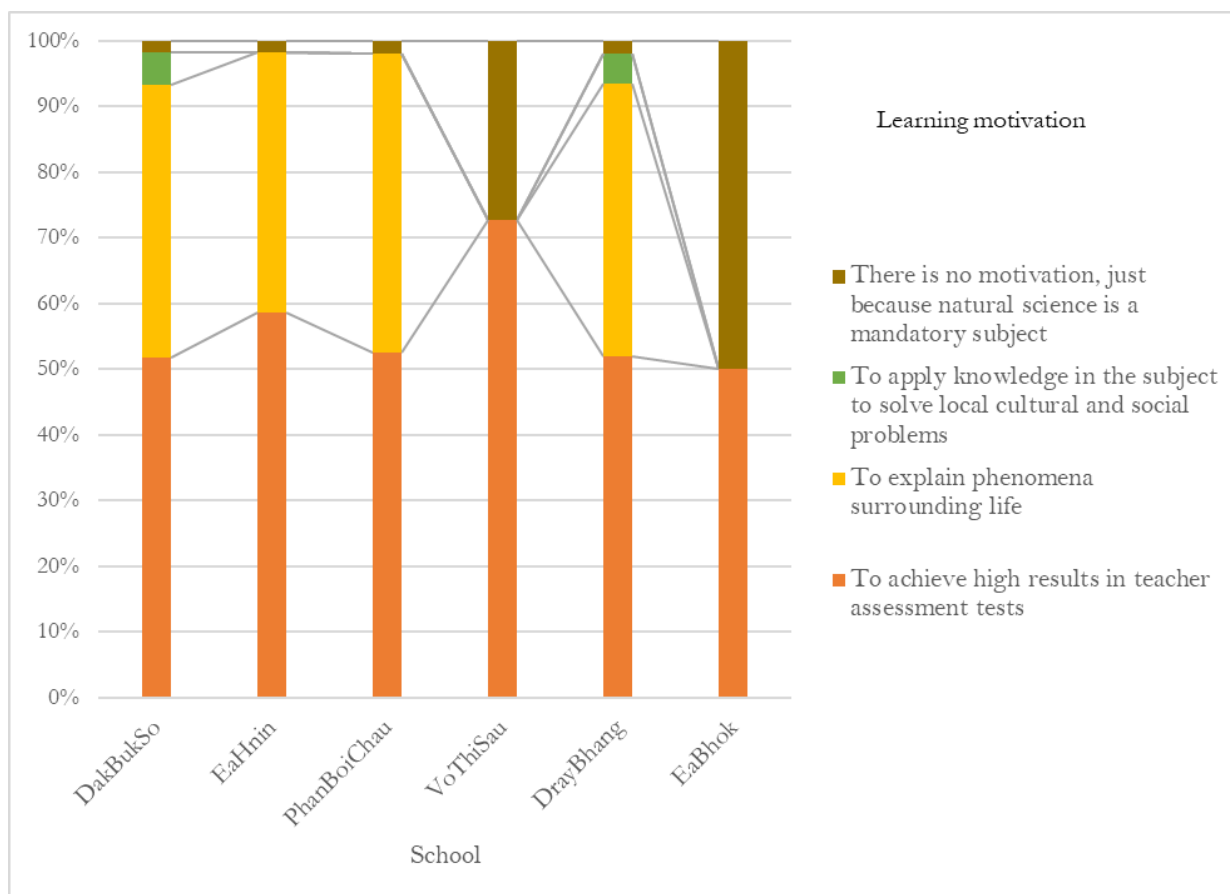
Figure 2. Students' motivation for studying natural sciences across the six schools.

The data reveals that 87.5% of students cite achieving high results on the teacher assessment test as their primary motivation for studying Natural Sciences, indicating that performance and grades are their main drivers. This underscores a focus on achievement and aligns with the current assessment methods that emphasize test results, as noted in the teachers' survey results.

Conversely, only 3.5% of students are motivated by applying knowledge to solve local cultural and social problems, reflecting a minimal inclination to connect natural science knowledge with practical issues. This low percentage suggests that students may not fully recognize or be encouraged to apply their natural science knowledge to real-world problems.

A total of 57% of students are motivated by the desire to explain life phenomena, demonstrating curiosity and a desire to understand their surroundings. Schools, such as Dak Buk So, DrayBhang, Phan Boi Chau, and EaHnin, where teachers frequently integrate cultural and social contexts and employ active teaching methods, show higher percentages of students expressing these motivations. This integration likely enhances students' recognition of the relevance of natural sciences to their daily lives, fostering curiosity and motivation.

Out of the total, 12.5% of students reported having "No motivation, just because Natural Science is compulsory," with this response being prevalent at EaBhok and Vo Thi Sau secondary schools. The teachers at these schools primarily use traditional teaching methods and infrequently integrate local cultural and social contexts, which may contribute to diminished learning motivation. The lack of active teaching methods and relevance to students' lives could lead to a perception that learning Natural Sciences is disconnected from real-world issues and practical challenges.

- Item 2: The three issues presented in the questionnaire are prominent cultural and social problems affecting the regions of the six surveyed schools. These issues could be addressed using knowledge from the 7th grade Natural Sciences curriculum, specifically the topic of "Sound." For instance, students could tackle the

"Cultural extinction of traditional musical instruments" by learning to create and preserve these instruments, applying concepts such as frequency, pitch, and loudness.

The survey results indicate that over 50% of the students are aware of these issues. However, 25.2% of the students did not recognize any local problems, with this trend being more pronounced at EaBhok and Vo Thi Sau secondary schools. Teachers at these schools rarely incorporate cultural and social contexts into their teaching, resulting in students being unaware of local issues.

Notably, 22.56% of students from indigenous communities in the Central Highlands failed to recognize the extinction of traditional musical instruments, despite these instruments being part of their cultural heritage. This lack of awareness is concerning, as "Cultural Space of Gon in Central Highlands" was recognized by UNESCO (a specialized agency of the United Nations that seeks to promote peace, sustainable development, and intercultural dialogue through education, science, culture, and communication) as a World Intangible Cultural Heritage in 2005, and these students should be aware of and work to preserve their cultural heritage.

Only 17% of students expressed concern about the negative impacts of these issues on their community, and 12% expressed a desire to participate in solving these problems. Additionally, 99.2% of students do not perceive themselves as capable of addressing socio-cultural problems, and 98.8% lack confidence in solving these issues. This suggests that students in the Central Highlands have not developed a strong sense of responsibility for local cultural and social issues. Despite a high percentage of teachers integrating cultural and social contexts into their teaching, this integration mainly serves to connect lessons to practical issues, rather than fostering a deeper sense of social responsibility.

- Item 3: Up to 78% of students either do not understand or have not heard of the concept of "responsibility" as outlined in the 2018 General Education Curriculum. This indicates a gap in students' understanding of the educational objectives related to responsibility and suggests that teachers are not effectively communicating these objectives or focusing on assessing students' development in this area.

- Item 4: The majority of the students (91.7%) expressed a preference for studying Natural Sciences if they perceive the knowledge as relevant to practical problems in their surroundings. Furthermore, 91.9% of the students showed interest in participating in local problem-solving activities facilitated by their teachers. Notably, 82.6% of the students stated that their belief in applying knowledge to solve local issues would be stronger if they understood the connection between their studies and the problems. This indicates that integrating local social and cultural contexts throughout the teaching process could significantly enhance students' motivation, problem-solving abilities, and confidence, thereby improving learning outcomes and increasing social responsibility.

4. DISCUSSION

The survey results support previous research findings that integrating cultural and social contexts into teaching not only enhances students' motivation to learn but also improves their awareness of practical issues in their surroundings (Hang, 2016; Phuong, Tra, & Hai, 2023). This trend is particularly evident in secondary schools, such as Dak Buk So, Dray Bhang, Phan Boi Chau, and EaHnin, where teachers frequently employ active teaching methods and integrate cultural and social contexts into their lessons. Conversely, at EaBhok and Vo Thi Sau secondary schools, where traditional teaching methods predominate and the integration of cultural and social contexts is limited, students do not perceive the relevance of natural sciences knowledge to real-life situations.

The integration of cultural and social contexts has typically been applied only at the beginning of lessons and has not been effectively utilized in other stages. Consequently, students' social responsibility that is reflected in their concern for issues, their desire to participate in problem solving, and their confidence in their ability to address problems remains low. This outcome necessitates changes in teachers' approaches, not only in teaching methods but also in their perspectives on the role of education. This finding aligns with research indicating that current

educational practices have not significantly impacted the development of social responsibility among students (Alsaeed, 2022).

The survey results from the teachers and students underscore the necessity to change teaching methods by increasing the use of cultural and social contexts throughout the teaching process. This aims to stimulate learning motivation, create interest, and encourage students to apply scientific knowledge to solve social issues faced by their local communities (Ulusoy & Onen, 2014). However, implementing CBL in natural sciences encounters several challenges, including:

1. The significant time and effort needed.
2. The impact on academic performance.
3. Difficulty in selecting appropriate cultural and social contexts for lessons.
4. A lack of understanding and confusion in developing learning activities linked to cultural and social contexts to foster social responsibility among students.
5. Economic conditions and specific cultural characteristics of students that may not align with CBL.

Teachers can overcome challenges 3 and 5 above. The survey results indicate that 42.8% of teachers with over 10 years of experience do not consider challenge 3 to be significant, as they are familiar with the cultural, social, and student characteristics at their schools. To address the challenge 3, teachers need to deepen their understanding of the cultural, social, and student characteristics at their workplaces to select appropriate contexts for lessons, as emphasized in many studies (Murphy & Whitelegg, 2006; Peşman & Özdemir, 2012; Srinivasa, Kurni, & Saritha, 2022). Regarding challenge 5, despite similar economic and social conditions among schools, such as EaBhok, Vo Thi Sau, and Phan Boi Chau, the teaching staff at Phan Boi Chau do not see this as a difficulty. They have improved their language skills to overcome communication barriers with students and have experimented with active teaching methods by integrating cultural and social contexts into teaching. This aligns with the trend of sustainable education, which encourages the use of language in teaching, enhancing scientific awareness among students and contributing to the preservation of indigenous languages (Vargas, 2000).

Challenges 1, 2 and 4 arise from teachers' insufficient understanding of the theory behind CBL. This leads to concerns about time investment, the potential impact on student performance, and confusion when designing learning activities. Currently, in Vietnam, there are very few materials and studies addressing CBL methods. These challenges can be resolved with training sessions or specific guidelines to help teachers implement CBL more effectively.

The research results show that 78% of the surveyed students have not heard of or do not understand the quality of "responsibility" as stipulated in the objectives of the 2018 General Education Program. This situation requires serious evaluation and recognition. Teachers need to regularly inform students about the general educational goals of the subject to help them understand its role in the curriculum, thereby fostering motivation and a more positive attitude toward learning.

5. CONCLUSIONS AND IMPLICATIONS

This study confirms that the integration of cultural and social factors into the teaching of Natural Sciences has an important role to play in the development of social responsibility in students. When teachers integrate cultural and social contexts into lectures, students not only have a higher motivation to learn but are also more aware of the practical issues around them, thereby motivating themselves to participate in solving problems that the locality is facing. However, in order to further improve the effectiveness of cultural and social CBL for students in Vietnam, it is necessary to take specific measures. First of all, it is necessary to organize training programs and provide detailed guidance for teachers on how to integrate cultural and social factors into teaching. These programs will help teachers better understand the theory and practice of new teaching methods, thereby becoming more confident in building-related learning activities. Secondly, it is necessary to conduct empirical studies and long-term monitoring

to evaluate the effectiveness of cultural and social CBL on the development of responsibility in students, thereby proposing improvements and adjustments appropriate to the specific conditions of each locality. Finally, support and encouragement from the school and education authorities to facilitate teachers to experiment and apply new teaching methods are required. Only with a consensus and effort from many sides, culturally and socially, can CBL be promoted effectively and contribute to improving the quality of education and comprehensive development for students in Vietnam.

REFERENCES

Acar, B., & Yaman, M. (2011). The effect of context-based learning on students' interest and knowledge levels. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 40*(40), 1-10.

Aikenhead, G. S. (2006). Towards decolonizing the pan-Canadian science framework. *Canadian Journal of Math, Science & Technology Education, 6*(4), 387-399. https://doi.org/https://doi.org/10.1080/14926150609556712

Alsaeed, H. (2022). The role of public education schools in developing social responsibility in the light of contemporary global trends. *Creative Education, 13*(9), 2754-2780. https://doi.org/10.4236/ce.2022.139174

Barthes, A. (2018). The hidden curriculum of sustainable development: The case of curriculum analysis in France. *Journal of Sustainability Education, 18.*

Bennett, J. (2003). Context-based approaches to the teaching of science in teaching and learning of science. In (pp. 99–122). UK: Continuum.

Bennett, J., Lubben, F., & Hogarth, S. (2007). Bringing science to life: A synthesis of the research evidence on the effects of context-based and STS approaches to science teaching. *Science Education, 91*(3), 347-370. https://doi.org/https://doi.org/10.1002/sce.20186

Berkowitz, L., & Daniels, L. R. (1964). Affecting the salience of the social responsibility norm: Effects of past help on the response to dependency relationships. *The Journal of Abnormal and Social Psychology, 68*(3), 275-281. https://doi.org/https://psycnet.apa.org/doi/10.1037/h0040164

Conrad, D., & Diane, H. (1985). *Instruments and scoring guide of the experiential education evaluation project.* Retrieved from https://digitalcommons.unomaha.edu/cgi/viewcontent.cgi?article=1246&context=slceslgen

DeBoer, G. E. (2011). The globalization of science education. *Journal of Research in Science Teaching, 48*(6), 567-591. https://doi.org/https://doi.org/10.1002/tea.20421

Gilbert, J. K. (2006). On the nature of "context" in chemical education. *International Journal of Science Education, 28*(9), 957-976. https://doi.org/https://doi.org/10.1080/09500690600702470

Gilbert, P., McEwan, K., Matos, M., & Rivis, A. (2011). Fears of compassion: Development of three self-report measures. *Psychology and Psychotherapy: Theory, Research and Practice, 84*(3), 239-255. https://doi.org/10.1348/147608310x526511

Hang, T. V. N. (2016). Context-based education: An advanced educational approach. *Hanoi National University Science Magazine: Educational Research, 3*(1), 11–17.

Hinton, P. R. (2014). *Statistics explained* (3rd ed.). Abingdon: Routledge. https://doi.org/https://doi.org/10.4324/9781315797564.

Jamison, A., & Mejlgaard, N. (2010). Contextualizing nanotechnology education: Fostering a hybrid imagination in Aalborg, Denmark. *Science as Culture, 19*(3), 351–368. https://doi.org/https://doi.org/10.1080/09505430903512911

Jaramillo, J. A. (1996). Vygotsky's sociocultural theory and contributions to the development of constructivist curricula. *Education, 117*(1), 133-141.

Jong, O. D. (2008). Context-based chemical education: How to improve it? *Chemical Education International, 8*(1), 1–7.

Malik, R. S. (2018). Educational challenges in 21st century and sustainable development. *Journal of Sustainable Development Education and Research, 2*(1), 9-20. https://doi.org/https://doi.org/10.17509/jsder.v2i1.12266

Millar, R. (1989). Constructive criticisms. *International Journal of Science Education, 11*(5), 587-596. https://doi.org/10.1080/0950069890110510

Ministry of Education and Training. (2008). *Circular No. 32/2018/TT-BGDDT (2018, December 26) circular promulgating the general education program. Promulgation of the New General Education Curriculum.* Vietnam: Ministry of Education and Training.

Murphy, P., & Whitelegg, E. (2006). *Girls in the physics classroom: A review of the research on the participation of girls in physics (Technical report)*. Retrieved from https://oro.open.ac.uk/6499/1/Girls_and_Physics_Report.pdf

Peşman, H., & Özdemir, Ö. F. (2012). Approach–method interaction: The role of teaching method on the effect of context-based approach in physics instruction. *International Journal of Science Education, 34*(14), 2127-2145. https://doi.org/10.1080/09500693.2012.700530

Phuc, V. N. (2008). Freedom and responsibility in human activities in social justice, social responsibility, and social solidarity. In (pp. 330–331). Hanoi, VietNam: Social Sciences Publishing House.

Phuong, T. T. N., Tra, H. D., & Hai, V. P. (2023). Teaching in relation to sociocultural contexts to improve student's personal and social responsibilities. *TNU Journal of Science and Technology, 229*(1), 11–19. https://doi.org/https://doi.org/10.34238/tnu-jst.9218

Psillos, D. (2001). Science education researchers and research in transition: Issues and policies. in Behrendt, H., et al. Research in science education - past, present, and future. In (pp. 275-284). Germany: Springer.

Roberts, T. G., & Ball, A. L. (2009). Secondary agricultural science as content and context for teaching. *Journal of Agricultural Education, 50*(1), 81-91. https://doi.org/10.5032/jae.2009.01081

Scales, P. C., Blyth, D. A., Berkas, T. H., & Kielsmeier, J. C. (2000). The effects of service-learning on middle school students' social responsibility and academic success. *The Journal of Early Adolescence, 20*(3), 332-358. https://doi.org/10.1177/0272431600020003004

Srinivasa, K. G., Kurni, M., & Saritha, K. (2022). Context-based learning in learning, teaching, and assessment methods for contemporary learners: Pedagogy for the digital generation. In (pp. 87-115). Singapore: Springer Nature Singapore.

Stinner, A. (2006). The large context problem (LCP) approach. *Interchange, 37*, 19-30. https://doi.org/10.1007/s10780-006-8398-9

Sutman, F., & Bruce, M. (1992). Chemistry in the community - ChemCom: A five year evaluation. *Journal of Chemical Education, 10*, 697–710. https://doi.org/https://doi.org/10.1021/ed069p564

Ültay, N., & Çalık, M. (2012). A thematic review of studies into the effectiveness of context-based chemistry curricula. *Journal of Science Education and Technology, 21*, 686-701. https://doi.org/10.1007/s10956-011-9357-5

Ulusoy, F. M., & Onen, A. S. (2014). A research on the generative learning model supported by context-based learning. *Eurasia Journal of Mathematics, Science and Technology Education, 10*(6), 537–546. https://doi.org/https://doi.org/10.12973/eurasia.2014.1215a

Vargas, C. M. a. (2000). Sustainable development education: Averting or mitigating cultural collision. *International Journal of Educational Development, 20*(5), 377-396. https://doi.org/10.1016/S0738-0593(99)00081-4

Venkatesan, M. (2021). Preserving culture in meeting sustainable development in Leal Filho, W., Azul, A.M., Brandli, L., Lange Salvia, A., Wall, T. (eds) decent work and economic growth encyclopedia of the un sustainable development goals. In (pp. 790–795). Cham: Springer.

Vetter, C., Pattison, P. M., Houser, K., Herf, M., Phillips, A. J., Wright, K. P., . . . Glickman, G. (2022). A review of human physiological responses to light: Implications for the development of integrative lighting solutions. *Leukos, 18*(3), 387-414. https://doi.org/10.1080/15502724.2021.1872383

Whitelegg, E., & Parry, M. (1999). Real-life contexts for learning physics: Meanings, issues and practice. *Physics Education, 34*(2), 68-72. https://doi.org/https://doi.org/10.1088/0031-9120/34/2/014

Wilkinson, J. W. (1999). Teachers' perceptions of the contextual approach to teaching VCE physics. *Australian Science Teachers Journal, 45*(2), 58-65.

Appendix 1. Survey form for students.

PART I. INFOMATION

Name: ....

School: ....

Class: ....

Ethnicity: ....

Place of residence: ....

PART II. QUESTIONNAIRE

1. What are your motivations for studying Natural Sciences? (select up to 2 answers that are most important to you)

    A.   To achieve high results on the teacher assessment test   ☐

    B.   To explain everyday phenomena   ☐

    C.   To apply the knowledge of the subject to solve cultural and social issues in my locality   ☐

    D.   For other motives   ☐

    E.   No motivation, just because Natural Sciences is a compulsory subject   ☐

2.1. Which of the following issues are happening in your area?

    1.   Noise pollution from bird's nest households   ☐

    2.   The cultural extinction of traditional musical instruments of the indigenous people of the Central Highlands   ☐

    3.   The air pollution and noise from the grinders during the coffee harvest season   ☐

    4.   Do not know which of the 3 issues above   ☐

2.2. Choose the answer that best suits you.

1. Not true for me   2. Sometimes true for me   3. Mostly true to me   4. Absolutely true for me

	1	2	3	4
1. Some students are very worried about the negative impact of such issues on everyone living around them	☐	☐	☐	☐
2. Some students look forward to participating in solving these problems	☐	☐	☐	☐
3. Some students have enough knowledge and skills to solve these problems	☐	☐	☐	☐
4. Some students have faith that they will solve these problems well	☐	☐	☐	☐

3. In the 2018 general education curriculum, the Ministry of Education and Training stated "Responsibility" as one of the five core qualities. These are essential for a student's growth and development in secondary school. Have you ever heard of it, and to what extent?

    1.   Known and profoundly understood   ☐

    2.   Often heard from teachers but not understood   ☐

    3.   Heard but can't remember   ☐

4.   Never heard of it   ☐

4. What is your view of the following statements?

   1. Strongly agree   2. Agree   3. Disagree   4. Strongly disagree

		1	2	3	4
1.	If you found that the Natural Sciences knowledge is related to the practical issues happening around you, you would prefer to study.	☐	☐	☐	☐
2.	You are very interested when the teacher gives you the opportunity to learn about and solve problems that are happening in your locality through learning tasks.	☐	☐	☐	☐
3.	When you clearly understand the connection between the concept learned and the problems that are happening where you live, you will be more confident in solving them.	☐	☐	☐	☐
4.	Culturally and socially, CBL used to develop social responsibility for students will affect their academic performance.	☐	☐	☐	☐

5. What activities do you find most engaging during natural science lessons?

Appendix 2. Survey form for teachers.

PART I. INFORMATION

Name: ....

Place of work: ....

Years of service: ....

Ethnicity: ....

Education level: ....

PART II. QUESTIONNAIRE

1. According to you, does integrating the cultural and social contexts of the locality where students live and learn into the teaching process lead to the development of social responsibility in students?

      A.   No development   ☐
      B.   Less development   ☐
      C.   Relatively good development   ☐
      D.   Good development   ☐

2. How about the integration of social and cultural contexts (where students live and study) into your lessons?

      A.   Never   ☐
      B.   Occasionally   ☐
      C.   Regularly   ☐

3. Which stage of the teaching process do you often integrate cultural and social contexts into (more than one option can be selected)

      A.   Introduction   ☐
      B.   Form new knowledge   ☐
      C.   Practice/Application   ☐

4. According to you, what difficulties might you encounter when teaching that are related to the cultural and social contexts of the locality where students study and live (integrating cultural and social contexts in all stages of the teaching process) in order to develop social responsibility for students?

1. Strongly disagree   2. Disagree   3. Agree   4. Strongly agree

142

		1	2	3	4
A.	The preparation and implementation of teaching takes a lot of effort and time for students and teachers.	☐	☐	☐	☐
B.	The 2018 General Education Curriculum is suitable for integrating contexts associated with culture and society of the locality.	☐	☐	☐	☐
C.	It's difficult to select local contexts suitable for the lesson content.	☐	☐	☐	☐

5. Please indicate any challenges you have encountered or anticipate facing in implementing teaching practices that integrate cultural and social contexts.

Appendix 3. Teacher interview questions.

1. Could you elaborate on your approach to incorporating cultural and social contexts into your teaching practices?

2. Which specific cultural and social factors do you typically integrate into your instructional materials?

3. What obstacles have you encountered in the process of incorporating cultural and social contexts into your teaching?

4. In your assessment, what impact does the integration of cultural and social contexts have on students' development of social responsibility?

5. Could you provide a detailed example of a lesson or activity you have conducted aimed at fostering social responsibility among students?

6. Do you regularly utilize any particular resources or materials to assist in integrating cultural and social contexts into your teaching?

7. What observations or feedback have you received from your colleagues concerning the integration of cultural and social contexts into teaching practices?

8. Do you believe that you have received sufficient professional development to effectively integrate cultural and social contexts into your teaching? If not, what additional support would be beneficial?

9. Are there existing school policies or programs that facilitate the incorporation of cultural and social contexts into teaching?

10. What recommendations do you have for enhancing the integration of cultural and social contexts in teaching to better support the development of students' social responsibility?