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Journal of Educational Research and Evaluation (JERE) is an interdisciplinary publication of original research and writing on education which publishes papers to international audiences of educational researchers. The JERE aims to provide a forum for scholarly understanding of the field of education and plays an important role in promoting the process that accumulated knowledge, values, and skills are transmitted from one generation to another; and to make methods and contents of evaluation and research in education available to teachers, administrators and research workers. The journal encompasses a variety of topics, including child development, curriculum, reading comprehension, philosophies of education and educational approaches, etc.

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Responses to the Socio-Ecological Crisis: Perceptions of In-Service Teacher

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A B S T R A K

Respon guru terhadap masalah krisis sosio-ekologis menjadi penting dan mendesak sebagai upaya meningkatkan kepekaan, kemauan dan kemampuan guru dalam mengidentifikasi potensi dan masalah sosio-ekologis yang ada di lingkungan sekolah dan sekitarnya. Studi ini bertujuan untuk menganalisis bagaimana guru yang mengikuti pelatihan guru dalam jabatan, yang disebut Pendidikan Profesi Guru (PPG), memandang masalah sosio-ekologis. Penelitian ini bertujuan untuk menganalisis persepsi guru terhadap krisis sosio-ekologis. Penelitian ini menggunakan pendekatan analisis kuantitatif dengan metode survei. Populasi dalam penelitian ini adalah 102 orang guru peserta Program Pendidikan Profesi Guru (PPG) Sekolah Dasar, dengan sampel sebanyak 96 orang. Pengumpulan data menggunakan kuesioner dengan format elektronik google form. Teknik analisis data menggunakan statistik deskriptif. Hasil penelitian tentang persepsi guru mendukung dimasukkannya materi krisis sosio-ekologis dalam pembelajaran lingkungan di sekolah dan PPG dalam jabatan guru magang. Kesimpulannya, meskipun guru masih mempraktikkan kebiasaan peduli dan ramah lingkungan di sekolah, guru telah memperhatikan pentingnya pembelajaran lingkungan kritis, pembelajaran luar ruangan, kolektif, dan masalah lingkungan dalam mencegah dan mengatasi masalah sosio-ekologis. Implikasinya, guru diharapkan memperoleh banyak dimensi dan perspektif lingkungan yang kritis dalam menanggapi permasalahan sosial-ekologis.

A B S T R A C T

The teacher's response to the problem of the socio-ecological crisis becomes important and urgent as an effort to increase teachers' sensitivity, willingness and ability to identify potential and socio-ecological problems that exist in the school environment and the surrounding area.Therefore, this study aims to analyze how teachers participating in in-service teacher training, called Teacher Professional Education (PPG), perceive socio-ecological issues. This study aims to analyze the teacher's perception of the socio-ecological crisis. This study uses a quantitative analysis approach with a survey method. The population in this study were 102 teachers participating in the Teacher Professional Education Program (PPG) primary school teacher training program, with a sample of 96 people. Data collection uses a questionnaire with an electronic google form format. The data analysis technique used descriptive statistics. The research results on teacher perceptions support the inclusion of socio-ecological crisis material in environmental learning in schools and PPG in in-service teacher training positions. In conclusion, although teachers still practice caring and environmentally friendly habits in schools, teachers have paid attention to the importance of critical environmental learning, outdoor learning, collective, and environmental problems in preventing and overcoming socio-ecological. The implication is that teachers are expected to gain many dimensions and critical environmental perspectives in responding to social-ecological problems.

1. INTRODUCTION

Many concerns on these issues have been widely initiated and agreed upon through international agendas ranging from the "Earth Summit Rio de Janeiro" in 1992, "World Summit on Sustainable Development, Johanesberg, South Africa in 2002, the 2015 Sustainable Development Goals (SDGs) agenda to the conference climate change in Madrid in early December 2019, but the results appear to be far from expectations. There is still a contradiction between environmental conservation and growth drive, environmental injustice practices experienced by poor and least developed countries, systemic impact of the global biosphere (Hausknost, 2020; Mattila, 2020; Nesmith et al., 2021). Responding to environmental problems can be done with a pre-disaster approach through environmental education in schools at all levels of education from basic education to higher education.

Although the current practice of teachers and students has encouraged a commitment to care for the natural environment, it is not sufficient to raise awareness of environmental citizenship, such as encouraging critical involvement and democratic processes in preventing and solving environmental problems (Ghosn-Chelala & Akar, 2021; Kirsop-Taylor et al., 2020). Four pedagogical aspects are problematic in Indonesia and many other developing countries, namely that they still dominate the ongoing rote learning; focus on transmitting facts; the gap between environmental awareness and knowledge on the one hand and pro-environmental behavior on the other; and the effects of learned helplessness and apathy (Parker & Prabawa-Sear, 2019). However, on the one hand, teachers can facilitate and, on the other hand, can hinder the creation of political space in educational situations, where what happens is that the political dimension is neutralized when the teacher determines what knowledge and moral orientation students should learn (Van Poeck & Östman, 2018). Many educators see environment and politics as separate fields of inquiry and, conversely, rarely use pedagogy that studies the interdisciplinary and interconnectivity of politics and the environment (Kirsop-Taylor et al., 2020). Social justice issues are not adequately addressed. Even the criticisms that emerged from schools were also judged to be part of a system that creates world environmental problems, and not much is expected to criticize the structure of capitalism, inequality, and injustice that creates environmental damage (Parker & Prabawa-Sear, 2019). In the environmental crisis, it is necessary to broaden the lens of analysis, such as paying attention to the social and political dimensions of educational practice. To build a conceptual and analytical framework, to consider environmental themes, political learning, and educational goals that support the curricular construction of the political dimension of environmental education so that students are not only individuals but also human beings and citizens in a democracy and society (Slimani et al., 2021). Political community. Using problem-based pedagogy in complex socio-ecological interdisciplinary learning can introduce students to deep and reflective political understanding and encourage students as agents of change in preparing the next generation of critical environmental problem-solving (Kirsop-Taylor et al., 2020). There are several obstacles in environmental education, including stagnant curricular reform, restrictions on topics that teachers must discuss, limited access to the latest information, and extracurricular activities that are less critical (Ghosn-Chelala & Akar, 2021). In dealing with and responding to ecological crises, educators are often hindered by time constraints, professional demands, and a lack of guidance on success (Verlie et al., 2020).

From the results of a review of many studies on environmental education models in schools that have been carried out by previous researchers, in general, it can be mapped into two orientations; namely, some show that the implementation of EE in schools is more directed toward environmentally friendly habituation practices that only emphasize attention to ecological sustainability. In contrast, others see the need for a change in educational orientation that is more critical (encouraging critical reflection on the idea of sustainable development) and can empower school residents and communities in taking action to save environmental damage and crime. Often educational discourse can dictate what may be done, who has the right to say it, and who makes judgments that are not appropriate and need to be marginalized or silenced (Fien, 2000). Why this can happen, of course, it is interesting to question how environmental education concepts and practices are being applied in schools. It is necessary to examine the goals and practices of schools in environmental education orientation (Stevenson, 2007).

Study on the perception of pre-service training teachers on environmental citizenship shows that it has been narrowed down to local scales, individual dimensions, and private spaces (Georgiou et al., 2021). Environmental citizenship can increase as a result of the professional development of teachers (Olsen et al., 2020); there is a need for environmental education that encourages and supports environmental sensitivity and activism (Abd-El-Aal & Steele, 2013); half of the teachers are rightly emphasizing economic aspects, protecting natural resources, and caring for people's lives now and in the future (Ganji et al., 2020). Studies on teacher perceptions of environmental education, in general, have been carried out starting from elementary schools and secondary to higher education for student teacher candidates. However, studies that specifically investigate how the perception of in-service teacher training teachers, especially in elementary schools, in responding to the problem of socio-ecological crisis have not been found. The teacher's response to the problem of the socio-ecological crisis becomes important and urgent as an effort to increase teachers' sensitivity, willingness and ability to identify potential and socio-ecological problems that exist in the school environment and the surrounding area. Therefore, this study aims to determine how teachers participating in in-service teacher training, called Teacher Professional Education (PPG), perceive socio-ecological issues. Research findings can complement the orientation of critical environmental education based on the perspective of teachers as part of the main actors of education in responding to increasingly severe and complex socio-ecological problems.

2. METHODS

This study uses a quantitative approach with a survey method. This research was conducted on teachers participating in the Teacher Professional Education Program in-service teacher training for elementary school teachers at the State University of Surabaya. The respondents in this study were 102 people spread across three classes in the third batch of 2021, with 96 samples taken. The study was conducted using a non-probability strategy, and the sampling technique used the Solvin formula with a set margin of error of 5% or 0.05. The sample was taken using the conventional method, namely by obtaining the teacher's name and contact information already available through the WhatsApp Group social media network for PPG in-service teachers at the State University of Surabaya. Data collection is done by giving an online questionnaire in the form of a google form to teachers whose data and cell phone numbers are already available; then, every teacher who can be contacted with a cellphone number receives a questionnaire in the form of a Google Form. Furthermore, several teachers were selected as samples for this study.

The instrument was developed by adapting several ecological worldviews developed by US Riley Dunlap through the New Ecological Paradigm (NEP) with some adjustments to be validated by expert judgment. The instrument was developed with 20 questions consisting of 14 closed main questions and six open questions. The details of the central closed questions include (a) 7 questions using a Likert scale with three alternative answers, namely 1 (very important), 2 (somewhat important), 3 (not important); (b) 2 questions with three alternative answers 1 (strongly agree), 2 (agree) 3 (disagree); and 4 (do not know); (c) 5 questions with two alternative answers Yes and no. The entire question scale was used to collect teachers' perceptions of critical socio-ecological issues in the interest of integration into school learning and in-service teacher training programs. This study uses quantitative descriptive analysis to explain the data collected as they are by describing them in percentages.

3. RESULT AND DISCUSSION

Results

Most of the teachers participating in in-service training were from public schools (83%), from rural areas (62.5%), female (79.2%), aged between 31-40 years (64, 6%), and participated in the Adiwiyata school program (34.5%), length of teaching experience between 11-20 years (59.4%), sources of information on environmental issues sourced from social media (70.2%).

Teacher's perception of the urgency of the content of the material on the socio-ecological crisis

Most of the teachers agreed to the presentation of the material on the socio-ecological crisis contained in the PPG. In detail, some of the reasons teachers need to be presented in teaching materials (96.9%); material enrichment activities (97.9%); teacher professional competence development (97.9%); student competency development (99%); discussion on the issue of environmental crimes or ecocides. Teachers' perceptions of PPG participants in positions regarding the integration of the overall socio-ecological crisis content are presented in Table 1.

Table 1. The Urgency of the Material Content of the Socio-Ecological Crisis

Aspect	Yes		No	
	f	%	f	%
Making the socio-ecological crisis material as part of the discussion of learning materials	93	96,9	3	3,1
Requires enrichment of material regarding the socio-ecological crisis in the PPG in-service teacher program	94	97,9	2	2,1
Believe that social-ecological crisis learning can help develop professional competence	94	97,9	2	2,1
Believe that social-ecological crisis learning can help develop student competencies (knowledge, skills, attitudes)	95	99	1	1
Understanding of ecocides (environmental crimes)	51	53,1	45	46,9

Table 1 shows that teachers consider it necessary to include material discussions about socio-ecological issues or crises in teacher professional education programs into various components such as enrichment of teaching materials and materials, development of teacher and student competencies, and discussion or dialogue activities during learning. Meanwhile, based on open-ended questions, the teacher's perception of how to teach students about the socio-ecological crisis is known to have diverse

views. In general, teachers see the need for integrating theory and practice in real life; utilizing the environment inside and outside the school as a learning resource; involving students in observing environmental conditions; carrying out environmentally friendly habituation practices, such as disposing of garbage, recycling garbage, caring for plants, growing vegetables, cleaning the school environment; showing a protected environment that is not through observation or image media; conveying moral messages; contextualizing learning materials on environmental issues; giving examples of environmental damage and involving in discussions; facilitating students to explore information; providing awareness of environmental care and love; integrating environmental content into learning tools. It is known that most teachers still pay great attention to activities oriented to habituation practices. However, there has been a need for a more relevant and integrated social and ecological crisis material in learning, outdoor-oriented, and encouraging active student participation.

The desired professional development obtained in implementing PPG in-service training on environmental education has various views. In general, teachers perceive how to preserve, maintain, and care for the environment; a fun way of learning about the environment; planning learning about the environment; learning outside the classroom; seminars/workshops/technical guidance; environmentally friendly education; integration of environmental materials into subjects/fields of study; waste recycling practices; integration into the curriculum; practicum, case studies on solving environmental problems; support for environmental education modules; learning to think critically by identifying problems and solving problems; insight into the causes of environmental damage; meaningful learning experiences; ecopreneurs. It is known that most teachers are still focused on integrating environmental conservation practices into the curriculum and learning. However, there has been a view toward the need for more critical learning about the causes of the socio-ecological crisis using investigative learning and problem-solving. Student competencies that can be developed through PPG in-service training on environmental education show various views. In general, teachers perceive the need for developing knowledge, skills, and attitudes; the ability to love, respect, and protect the environment; waste processing practices, recycling unused items; habituation practices such as clean behavior; fostering activeness and environmental awareness; insight into environmental impacts; developing critical, creative thinking, problem-solving, collaboration, communication; instilling responsibility for the environment; emphasizing religious attitudes in the form of gratitude towards the gift of natural resources; take advantage of environmental problems as a learning experience; develop a critical attitude and sensitivity to environmental issues; ecopreneur; collaboration between teachers and students in solving environmental problems. It is known that most teachers still emphasize the orientation of the habituation practice of environmentally friendly activities and rehabilitative actions on a limited scale in the school environment. However, there are already teachers' views on the need to develop a critical attitude and collective responsibility in solving environmental crises.

Meanwhile, teachers' perceptions of ecocides are known to be quite diverse, including ecocides are perceived as environmental crimes; environmental killings; environmental pollution such as the Sidoardjo mud case, air pollution, industrial wastewater pollution, use of pesticides; severe international problems; exploitative use of resources; hearing for the first time; extermination in a structured, systematic and massive manner; not understanding; crimes through the use of chemicals; abuse of natural resources such as illegal logging; lack of understanding; improper use of the environment; due to irresponsible government and business actors. It is known that most teachers already have an adequate perception of the mention of ecocide as an irresponsible act, identical to damage and included as an act of crime against the environment. However, there are still teachers who are new to the term, and there were teachers who stated that they did not know or understand.

The knowledge and experiences that have been obtained or experienced by teachers related to environmental education, including the issue of socio-ecological crises, are conveyed in quite a variety of ways, namely being able to understand, love, and appreciate in environmental conservation; go green insight, utilize the environment as learning; recognize the importance of protecting and caring for the environment; experience in involving students in recognizing the environment; increasing awareness of the environment; being a role model for students; not having any because at school there is no program environment; make learning more meaningful; have not felt the benefits because the school has not fully implemented; the environmental love movement; the practice of processing waste, hydroponic plants, biopori, compost fertilizer; making the school environmentally friendly , clean and comfortable; can learn to deal with pollution; can know the importance and benefits of the environment for life. It is known that most of the teachers stated that they had benefited from environmental learning, especially in inculcating a caring and friendly attitude towards the environment through habituation practices in schools. However, there are also statements by teachers who have not received these benefits because the school where they work does not yet have programmed environmental care activities or is not entirely optimal.

Finally, the obstacles experienced and felt by teachers regarding environmental education in schools include less application in real life; there is no environmental education in schools; environmental damage is getting bigger; cannot conclude; not all schools receive environmental education socialization; lack of consistency in running the program; environmental learning is still minimal; is still weak and lacks awareness of protecting the environment; infrastructure is not supportive; still not familiar with environmental materials; lack of information and socialization; limited funding. It is known that institutional support factors influence the obstacles conveyed by the teacher related to environmental learning in the form of support for infrastructure that is not optimal, lack of program sustainability, lack of information, socialization, and internal communication.

Teacher's perception of social-ecological crisis learning

Most teachers consider it essential to pay attention to environmental activism, such as identifying potential and environmental problems (92.7%), environmental care actions indoors (91.6%), environmentally friendly practices (86.4%), advocating for saving the environment (63,5%), environmental literacy (81.2%). Meanwhile, regarding the socio-ecological actions presented in learning in schools, most teachers perceive that they are very important, such as through the practice of inquiry outside of school (72.9%), advocacy delivery (63.5%), environmental care communities (71.8%), involvement active with the community (66.6%), as well as relations and communication with stakeholders (71.8%) as presented in Table 2.

Table 2. Integration of Socio-Ecological Crisis Materials in Learning in Schools

Dimension	Statement	Very Important		Rather Important		Not Important	
		f	%	f	%	f	%
Business activities/activities to be presented at school	Identification of potential and environmental problems around the school/region	89	92,7	7	7,2		
	Action to care for the environment in the school area	88	91,6	8	8,3		
	Action to save the environment outside the school	76	79,1	20	20,8		
	Environmentally friendly practices (such as energy-saving, waste recycling, etc.)	83	86,4	13	13,5		
	Advocacy activities to save the environment	61	63,5	33	34,3	2	2,1
	Environmental literacy socialization	78	81,2	17	17,7	1	1,1
Ecological action is presented in learning in schools	The practice of investigating potential and environmental problems in the environment outside the school/surrounding environment	70	72,9	24	25	2	2,1
	Ability to make recommendations to the authorities as consideration for improving the environmental crisis by thinking about existing problems	61	63,5	33	34,3	2	2,1
	Forming environmental care groups to help/handle bad/problematic environmental conditions	69	71,8	26	27,08	1	1,1
	Invite the active involvement of the community	64	66,6	31	32,2	1	1,1
	Maintain good relations and communication between stakeholder/stakeholder groups	69	71,8	27	28,1		

Based on Table 2, it is known that there is already hope and need for teachers for environmental learning that encourages environmental activity in the form of active and participatory collective responsibility. However, there are still many who place more emphasis on environmentally friendly environmental practices in schools.

Teacher's perception of the need for further understanding of the socio-ecological crisis material

Most teachers consider it important to explore topics regarding ecological crises such as exploitation of natural resources (64.5%), discrimination and social injustice (68.7%), contradictions between the environment and socio-economics (62.5%), and environmental degradation (57. ,2%). In addition, teachers consider it necessary to present discussions of socio-ecological crisis issues on a wider

scale, starting at the local (92.7%), national (77.1%), regional (69.7%) to global (61.4%) scales.). Most of the teachers considered it important to further elaborate on the issue of socio-ecological crises such as air pollution (62.5%), social injustice (55.2%), climate change (57.2%), river pollution (56.2%), exploitation of extractive industries (53.1%), species extinction (50%), in detail as presented in Table 3.

Table 3. Teacher Needs the Expansion of the Material on the Ecological Crisis

Dimension	Statement	Very Important		Rather Important		Not Important	
		f	%	f	%	f	%
Exploration of socio-ecological materials	Relationship between environmental and economic issues (exploitation of natural resources)	62	64,5	34	35,4		
	Relationship between environmental and social issues (discrimination, social injustice, etc.)	66	68,7	28	29,1	2	2,1
	Relationship between environmental and social, and economic issues	60	62,5	35	36,4	1	1,1
	(space narrowing, land conversion, etc.)	55	57,2	38	39,5	3	3,1
The scale of the issue of the socio-ecological crisis	The problem of the ecological crisis on a local scale	89	92,7	7	7,2		
	The problem of the ecological crisis on a national scale	74	77,1	22	22,9		
	The problem of the ecological crisis on a regional scale	67	69,7	28	29,1	1	1,1
	The problem of the ecological crisis on an international/global scale	59	61,4	37	38,5		
Elaboration on the issue of socio-ecological crisis	Air pollution (such as pollutants from factory and vehicle fumes)	60	62,5	36	37,5		
	Social injustice (such as forest smoke fires, land conversion, narrowing of space, etc.)	53	55,2	43	44,7		
	Climate change (such as floods, droughts, cyclones, etc.)	55	57,2	41	42,7		
	River pollution (such as industrial and household wastewater)	54	56,2	40	41,6	2	2,1
	Extractive industries (such as mining and forest encroachment)	37	38,5	51	53,1	8	8,3
	Extinction of species (such as plant and animal biodiversity)	43	44,7	48	50	5	5,2

Table 3 shows that most teachers have paid enough attention to the importance of more critical and in-depth learning about social-ecological crises such as exploitation of natural resources, social injustice, and the need to link socio-ecological issues on a local to global scale.

Teachers' perceptions of environmental learning practices in schools

Most teachers view the importance of environmental care activities in schools such as cleaning the school environment (87.5%), waste management (67.7%), plant care (73.9%), water conservation (40.6 and 48.9 %), energy conservation (62.5%), environmentally friendly refraction (71.8%), environmental campaigns and publicity (33.3% and 45.8%), investigation of environmental issues (44.7%), action saving the environment (47.9%) as presented in Table 4.

Table 4. Teachers' Perceptions of Environmental Learning Practices in Schools

Dimension	Statement	Very Important		Rather Important		Not Important	
		F	%	F	%	F	%
Pro-environmental	Cleanliness, sanitation, drainage	84	87,5	12	12,5		
	Waste management (e.g., waste sorting, composting, recycling)	65	67,7	26	27,1	5	5,2

Dimension	Statement	Very Important		Rather Important		Not Important	
		F	%	F	%	F	%
activities carried out in schools	Planting and maintaining plant trees (e.g., greenhouse, toga garden, vertical garden, etc.)	71	73,9	23	23,9	2	2,1
	Water conservation (e.g., infiltration wells, rainwater harvesting, utilization of wastewater, etc.)	39	40,6	47	48,9	10	10,4
	Energy conservation (energy saving)	60	62,5	32	33,3	4	4,1
	Environmentally friendly habits (such as using a tumbler, being free of plastic waste, etc.)	69	71,8	21	21,8	6	6,2
	Campaigns and publications in the media	32	33,3	44	45,8	20	20,8
	Identification of environmental problems outside of school (investigation assignments)	39	40,6	43	44,7	14	14,5
	Responding to problems through actions to save the disturbed environment	41	42,7	46	47,9	9	9,3

Based on Table 4, it is known that teachers still place environmental hygiene activities, waste management, and energy conservation as priorities for environmental action in schools. However, some teachers have paid considerable attention to environmental investigations, advocacy, and action to save the environment.

Teacher's perception of critical learning about the socio-ecological crisis

Most teachers view the importance of critical learning about socio-ecological crises such as growing sensitivity to socio-ecological issues outside of school (90.6%), long-term environmental impacts (91.6%), reviewing practices (81.2) %), structural causes (75%), environmental injustice practices and the impact of environmental crimes (82.2%), problem-posing teaching (79.1%), critical-dialogical and democratic teaching about environmental problems (80.2%). In detail, the needs of teachers in learning about the ecological crisis are presented in Table 5.

Table 5. The Need for Critical Learning about the Socio-Ecological Crisis

Dimension	Statement	Very Important		Rather Important		Not Important	
		F	%	F	%	F	%
The need for critical learning about the socio-ecological crisis	Sensitivity to local environmental conditions/problems (environmental issues outside of school)	87	90,6	9	9,3		
	Sustainable mindset development (thinking long-term impact)	88	91,6	8	8,3		
	Reviewing contributions to environmental management practices (which have been, are being, and will be done)	78	81,2	18	18,7		
	Investigating environmental issues that have socio-economic and political dimensions (land conversion/ swapping, etc.)	72	75	22	22,9	2	2,1
	Recognizing the practice of social injustice as a cause and impact of environmental crime	79	82,2	16	16,6	1	1,1
	Problem-based teaching as a research space	76	79,1	19	19,7	1	1,1
	Dialogic-based, democratic, and critical teaching on environmental issues	77	80,2	18	18,75	1	1,1

Table 5 shows that teachers have paid great attention to the importance of critical learning in environmental learning in schools. The need for critical environmental learning is directed at the need to investigate the complexity of environmental issues and multiactivity in the environmental learning process.

Teachers' perceptions of the issue of environmental crime (ecocide)

Most of the teachers showed a very agreeable attitude towards the discussion of issues regarding environmental crimes, such as protesting against companies that damage the environment (50%), suing

legally against companies that damage the environment (48.9%), and giving compensation to environmental victims (51.1). %), giving criminal sanctions against companies that violate (53.1%), revocation of permits for companies that commit environmental crimes (56.2%), efforts by citizens to file lawsuits for environmental losses caused (50%), the seriousness of the government in overcome the socio-ecological crisis (61.4%), ease of licensing as the cause of massive environmental damage (45.8%). In addition, teachers also perceive the presence of science and technology as the primary solution to the environmental crisis (81.2%), and nature fully serves human interests (63.5%). Human activities are not the leading cause of climate change (39.5%), climate change is an important problem for humanity (92.7%), humans are the cause and solution to the socio-ecological crisis (97.9%), environmental problems have a socio-political dimension (87.5%). In detail, the teacher's perception of the issue of environmental crime is presented in Table 6.

Table 6. The Need for Critical Learning about the Socio-Ecological Crisis

Dimension	Statement	Strongly Agree		Agree		Disagree		Do Not Know	
		F	%	F	%	F	%	F	%
Position on environmental crime issues	To protest against corporations (companies) that destroy the environment (such as river pollution, deforestation, land fires, confiscation of people's living space)	48	50	40	41,6	6	6,2	2	2,1
	Support lawsuits against corporations that destroy the environment (such as river pollution, deforestation, land fires, confiscation of people's living space)	47	48,9	42	43,7	3	3,1	4	4,1
	Provision of compensation penalties for corporations that damage the environment	49	51,1	43	44,7	2	2,1	2	2,1
	Giving criminal sanctions to corporations that commit environmental crimes	51	53,1	43	44,7	2	2,1		
	Revocation of permits for corporations that commit environmental crimes	54	56,2	36	37,5	4	4,1	2	2,1
	Citizens' efforts to file lawsuits against corporations that commit environmental crimes	48	50	43	44,7	3	3,1	2	2,1
	The government is serious about dealing with environmental crises (such as forest fires, exploitation of natural resources, and other crimes committed by corporations	59	61,4	34	35,4	1	1,1	2	2,1
	One of the causes of environmental damage due to corporate crime is the ease of licensing from the government	44	45,8	44	45,8	5	5,2	3	3,1
Science and technology as a solution to environmental damage	Science and technology are the leading solutions to overcome the environmental crisis	78	81,2			18	18,7		
	The universe is entire to serve human interests	61	63,5			35	36,4		
	Human activities are not the leading cause of climate change.	38	39,5			58	60,4		
	Climate change is an essential issue for human society.	89	92,7			7	7,2		
	Humans as both the cause and the solution to the environmental crisis	94	97,9			2	2,1		
	Environmental issues have a socio-political dimension	84	87,5			12	12,5		

Based on Table 6, it is known that the teacher has shown a critical attitude toward the need for environmental crimes to be held accountable for the socio-ecological damage caused. Various actions include environmental advocacy activities, lawsuits, and strict legal sanctions. However, concerning the perception of science and technology, the teacher, on the one hand, is still placed as the leading solution and places the existence of natural resources as a commodity to serve human interests.

Discussion

The purpose of implementing the PPG Program in the office is to produce professional teachers and contribute to the advancement of education in Indonesia. Departing from these orientations and objectives, the implementation of PPG in positions has at least a need for improving the quality of education, including through environmental education practices, both natural, social, and cultural interactions. Based on the findings regarding teachers' perceptions, most of them agree to include a discussion of the socio-ecological crisis in PPG learning materials, indicating that there is quite a lot of curiosity. This is an excellent opportunity to fully present the complexity of the socio-ecological crisis that involves many dimensions. This potential curiosity of the teacher can then be used as an entry point to introduce the existing reality related to the socio-ecological problems around them. Teachers can be actively involved in a critical reflective process in seeing the triggers, causes and implications. In the end, teachers can then be encouraged to seek environmental action by addressing and preventing the emergence of socio-ecological problems. Most teachers still pay great attention to activities oriented to habituation pra in environmental learning activities times. This tendency can be understood because the orientation of environmental education in elementary schools, especially in the early grades (first, second and third grades) still emphasizes habituation practices such as clean and environmentally friendly living. However, entering the advanced class (fourth, fifth and sixth grades), there is hope to be gradually introduced to more authentic and problematic environmental issues such as river water pollution, factory smoke pollutants, floods and so on. It is not intended to undermine the success of existing and ongoing environmental education, but efforts to increase the capacity of critical environmental agencies have not been explicitly the focus of the environmental education model so far. On the one hand, it is very important to emphasize the critical reflective awareness of teachers and on the other hand it is necessary to ensure that the school climate does not limit, let alone curb alternative views in seeking critical environmental action. If it is not discussed critically, it will tend to fall back on conventional thinking that only relies on scientific management and knowledge transfer (Brand et al., 2020); and has implications for the loss of authentic opportunities to enforce their agency (Schild, 2016). In dealing with and responding to ecological crises, educators are often hindered by time constraints, professional demands, and a lack of guidance on success (Verlie et al., 2020). Through her studies, Verlie provides a starting point for further exploring how educators can practically navigate interpersonal complexities to foster active hope in the context of increasing ecological stress. Nevertheless, there has been a need for a more relevant and integrated social-ecological crisis material in learning, oriented outside the school environment (outdoor) and encouraging active involvement and participation of students.

Most teachers are still focused on integrating conservation and environmentally friendly practices into curriculum and learning. The most dominant environmental action activities seen in schools are generally related to plant care and preservation activities, environmentally friendly behaviors such as energy saving, waste management, and so on. The strong tendency of schools to focus on environmental education in changing environmentally friendly behaviors such as saving on the use of lights, turning off the water faucet when brushing teeth, and reducing water waste (Lewis et al., 2014). Meanwhile, the actions implemented through environmental education programs are mostly related to improving environmental conditions, such as planting trees for habitat restoration and cleaning beaches, rivers, or school grounds (Harder et al., 2014). In another case, in the national curriculum in the UK, students are required to learn about the potential and mitigating effects of human-generated greenhouse gases on the earth's climate. However, at the same time, it does not require students to understand the broader impact of climate change on the environment, economy, and society or consider issues of social justice to climate change (Howard-Jones et al., 2021).

Most of the teachers still emphasize the orientation of the practice of habituation to environmentally friendly activities and rehabilitative actions on a limited scale in the school environment. In implementing environmental education in Indonesia, most studies report on the effect/impact of implementing activities on the habituation of environmentally friendly behavior in schools. The activities that students in schools mainly carry out include watering plants and energy efficiency, saving consumption activities using lighting, and ventilation, other activities in the form of maintaining classroom cleanliness and school sanitation, cleaning competitions, plant maintenance picket activities, vertical garden plant design, waste bank/ composter (Adela et al., 2018; Kamil et al., 2020; Nurwidodo et

al., 2020; Roswita, 2020). However, there are already teachers' views on the need to develop a critical attitude and collective responsibility in solving environmental crises. However, in line with the need for developing students' critical thinking skills, there is a view towards more critical learning about the causes of the socio-ecological crisis through investigative learning and problem solving. This condition poses a further challenge to the need for critical education development in environmental issues, including ecopedagogy. The practice of ecopedagogy in education and the worldview of education has developed into two major movements, namely philosophical ecopedagogy and critical ecopedagogy, where the latter orientation pays attention to socio-ecological issues (Hung, 2021). Ecopedagogy aims to promote a critical understanding of human/nature relationships based on reactions to experiences (Zocher & Hougham, 2020). Ecopedagogical learning is closely related to transforming education socially and ecologically. Most teachers already have an adequate perception of the mention of ecocides as an irresponsible act, identical to damage and included as an act of crime against the environment. However, there are still teachers who are new to the term, and there are teachers who state that they do not know and do not understand. Previous study identify three broad views concerning contemporary environmental issues: anthropocentrism, ecocentrism, and technocentrism (Balundė et al., 2020). This complete view can be used to identify values that are relevant to pro-environmental behavior and environmental citizenship. These differences often have implications for selecting different focuses and practices, often overlapping and contradicting environmental management. The anthropocentric view is directed at the intrinsic value of humans and considers all other things (non-humans), as only instrumental in value where something can only be of value to the extent that it is a tool or instrument that can serve humans. Previous researcher calls anthropocentric as human-centered where something is always seen from the human point of view which is in contrast to non-anthropocentric (ecocentric) which views humans as part of a biotic community where non-human needs are not disturbed for any reason including the fulfillment of sustainability (Callicott, 2014). The institutional support factors influence the obstacles conveyed by the teacher related to environmental learning in the form of support for infrastructure that is not optimal, lack of program sustainability, lack of information, socialization, and internal communication. This condition is relevant to the general obstacles to implementing environmental education in Indonesia. Many studies are evaluating the implementation of environmental education report several obstacles that are still encountered. Miscommunication was the main obstacle in the socialization and internalization of the four components of the Adiwiyata school in Pekanbaru (Rachman & Maryani, 2018). The lack of development of student environmental literacy due to a lack of understanding of environmental concepts and learning plans have not been directed at empowering environmental literacy (Wardani et al., 2018). Responding to this gap, the need for an inquiry-based planning process or an Inquiry-Based Approach (IBA) that can be used as a guide for a common understanding of the problem and making joint decisions in making decisions that differ from top-down and expert-based processes (Calderon & Westin, 2021). There has been an expectation and need for teachers for environmental learning that encourages environmental activity in the form of active and participatory collective responsibility. However, many still place more emphasis on environmentally friendly environmental practices in schools. Regarding this tendency, the frequent environmental education that focuses on behavior modification characterized by deterministic behavior that seeks to control through predicting and strengthening specific ways of thinking and acting to have implications for the loss of authentic opportunities to exercise their agency (Schild, 2016). Because of this, many researchers have suggested that there is a need for educational models that can promote a strong type of environmental citizenship and move beyond individualistic and behaviorist approaches to integrate better Environmental citizen engagement in civic participation and collective action in environmental education practices (Hadjichambis & Paraskeva-Hadjichambi, 2020).

Most teachers have paid enough attention to the importance of more critical and in-depth learning about socio-ecological crises such as exploitation of natural resources, social injustice, and the need to link socio-ecological issues locally to globally. The teacher's attention to the interconnectedness of socio-ecological issues on a local to global scale will encourage teachers to see further implications and gain a broader perspective. In other words, socio-ecological problems in one place or even a country may occur in different locations or countries and even have global impacts such as increasing sea levels and global climate change. Various studies show a strong tendency toward environmental education practices that investigate activities related to environmental problems in the outdoor environment and with critical socio-ecological dimensions. the lack of proper pedagogy can be a barrier to the success of environmental education learning (Kirsop-Taylor et al., 2020). Many educators see environment and politics as separate fields of inquiry and, conversely, rarely use pedagogy that studies the interdisciplinary and interconnectivity of politics and the environment. Through their research, Kirsop show that using problem-based pedagogy in complex socio-ecological interdisciplinary learning can introduce students to

deep and reflective political understanding and encourage students as agents of change in preparing the next generation of critical environmental problem-solving (Kirsop-Taylor et al., 2020).

Teachers still place environmental hygiene activities, waste management, and energy conservation as priorities for environmental action in schools. However, some teachers have paid considerable attention to environmental investigations, advocacy, and action to save the environment. This tendency becomes important to gradually shift the orientation of private (individual) responsibility towards public (collective) responsibility. In current study trends, there is a need to increase students' access to environmental education field experiences and to link these outdoor experiences to relevant curricula in the classroom. The activities of teachers and students in high schools in New York, USA, who designed a research-based field investigation to record water quality in watersheds (O'Neil et al., 2020). The importance of Outdoor Environmental Education (OEE) has created an educational experience about history, nature, and culture in Australian places where students are (Stewart, 2020). Several studies explore teachers' beliefs about the role of emotions such as worry, anger, frustration about environmental crisis issues, and how teachers handle students' emotional reactions. There are various views of teachers, where there are those who view emotions as negative and irrational while others consider them positive to introduce the correct view of reality and be helpful in the learning pro (Ojala, 2021). Teachers have paid great attention to the importance of critical learning in environmental learning in schools. The need for critical environmental learning is directed at the need to investigate the complexity of environmental issues and multiactivity in the environmental learning process. The existence of competing discourses in environmental education, and it is essential to note that there is still live disagreement about the goals of environmental education, which can lead to conflicting goals and outcomes (Schild, 2016). From the results of a review of some studies on environmental education models in schools that have been carried out by previous researchers, in general, it can be mapped into two orientations; namely, some show that the implementation of EE in schools is more directed toward environmentally friendly habituation practices that only emphasize attention to ecological sustainability. In comparison, others see the need for a change in educational orientation that is more critical (encouraging critical reflection on the idea of sustainable development) and can empower school residents and communities in saving actions from environmental damage and crime through environmental citizenship. Policy making has the potential to produce and/or inhibit effects consistent with the conception and mobilization of environmental education topics in education policy (Mejía-Cáceres et al., 2021). Likewise, teachers have shown a critical attitude towards the need for perpetrators of environmental crimes to be held accountable for the socio-ecological damage caused. Various actions include environmental advocacy activities, lawsuits, and strict legal sanctions. However, regarding the perception of science and technology, the teacher, on the one hand, is still placed as the primary solution and the existence of natural resources as a commodity to serve human interests. This tendency should be balanced critically because using technical solutions that place technology as the main solution often creates new problems.

Some experts reject the claim that environmental damage can be overcome through the presence of technology and socio-technical-economic approaches but on the contrary science and technology are the main causes of unsustainability. However, York & Mancus through the perspective of environmental sociology are positioned not to reject or glorify science because the logic of science is needed to understand the environment and the human impact on it (York & Mancus, 2009). But technological advances that are solutions to environmental problems must be critically interrogated. In addition, there is a teacher's view that positions humans as having a dual role as the cause of environmental damage and solutions to problems that arise. Environmental degradation is the result of dynamic interactions between socio-economic, institutional, and technological activities; therefore, considers that it is not enough for citizens only to try to solve environmental problems or restore a damaged environment but is also required to be able to identify the structural causes of the problem (Hadjichambis & Paraskeva-Hadjichambi, 2020). Environment and work adequately and democratically to address it. This study seeks to complement the current limitations on the orientation of environmental education in Indonesia and many other countries, which still do not pay attention to the urgency of socio-ecological issues with a more critical perspective. There is an important and urgent need to seek to improve the quality of pre-disaster efforts that are not only directed at solving problems but also towards preventing socio-ecological crises. This research is still limited to primary school teachers participating in PPG at one university, so that it can be extended to many higher education providers of similar programs in various scientific fields. In addition, future research can investigate in depth how teachers present information and build communication in a dialogical manner in empowering teachers to fully understand and apply social-ecological crisis issues in learning in schools.

4. CONCLUSION

Most teachers have perceived the need to include material on the socio-ecological crisis, both in teaching at the teacher professional education program and in learning at school. The findings show a need for a critical discussion of the socio-ecological crisis through investigative learning and problem-solving. The teacher believes it essential to develop a critical attitude and collective responsibility in responding to the socio-ecological crisis. In addition, teachers already have an adequate perception of crimes against the environment, the need for strict sanctions against acts of environmental destruction, and encouragement to increase environmental activism. Based on the findings of this study, a new perspective can be obtained regarding the need to provide a more critical environmental education perspective. In addition, it is hoped that there will be a willingness to question and at the same time have the courage to review the practices that have been carried out so far which may lack or even ignore the critical reflective needs of various socio-ecological issues. Therefore, this study recommends that teachers gain access to the widest possible learning experience to a comprehensive and critical discussion of the socio-ecological crisis.

5. ACKNOWLEDGEMENT

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