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# MAJOR CHALLENGES OF TEACHERS IMPLEMENTING NATURE-BASED EDUCATION CONCEPT SECONDARY SCHOOL STUDENTS IN INDONESIA

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**ABSTRACT**

This study focused on the challenges associated with implementing nature-based education in secondary schools in Indonesia. The study argues that nature-based education is crucial despite facing difficulties due to the prevalent use of conventional classroom practices. A narrative review methodology was employed to gather and analyse relevant academic papers, and the Miles and Huberman model was used for data analysis. The findings emphasize the significance of incorporating nature-based education into the curriculum. However, three major challenges were identified as obstacles to its implementation in Indonesia: teachers' beliefs, students' environmental behaviour, and the lack of support for the curriculum. The study acknowledges potential limitations, such as the scarcity of data and the complexity of certain terms used. It calls for further research specifically focused on the Indonesian context to address the current research gap in this area.

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**Keywords:** Environmental Behaviour, Teacher's Beliefs, Nature-Based Concept.

## INTRODUCTION

For years, nature-based learning has been believed to positively influence individuals, as well as social, community, and environmental development (Gray, T., & Martin, P., 2012). Given that, the natural world will be significantly impactful to engage students in the learning process (Dowdell, Gray, & Malone, 2011). Echoed this, Kelz, Evans, and Röderer (2013) assert that redesigning a greener schoolyard can be beneficial to reduce students' psychological stress and well-being. Additionally, nature can take the role of a great teacher, children's contact with nature will be beneficial for their growth (Larimore, 2018).

Otto and Pensini (2017) elaborate on the definition, "nature-based environmental education, which combines the acquisition of environmental knowledge with the promotion of an intrinsic driver, namely connectedness to nature, is proposed as a holistic approach to increasing ecological behavior".

The paramount importance of nature-based education is delineated by Ballantyne and Packer (2010) from an environmental perspective: being a learner from mother nature may positively influence children's attitudes towards nature such as caring and practicing environmental behavior in the household. Unfortunately, the idea of outdoor learning for many teachers and parents unsafe for their children for several reasons such as the safety issue and the failure of delivering the curriculum properly (Copeland, Sherman, Kendeigh, Kalkwarf, & Saelens, 2012; Munroe & MacLellan-Mansell, 2013; Nelson, 2012 as cited in Coe 2016).

Moving to the Indonesia case. Adapting and adopting such a new curriculum in Indonesia is a difficult task to conduct

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especially in nature-based education which is a slightly unfamiliar concept as the consequence of the teaching and learning mainly conducted in conventional classroom practice. Hence, I construct the investigation question in this paper to inquire what are the possible major challenges in implementing outdoor learning for secondary school classes and how these difficulties negatively work in relation to the applicability of this concept of learning.

Through this essay I want to argue that nature-based education is absolutely essential, however, there are three major factors that deter it to be implemented for secondary school students in Indonesia, namely teachers' beliefs, students' environmental attitudes, and unsupported curriculum. These three key concepts will be elaborated subsequently in the next paragraph.

Hutner and Markman (2016) redefine the description of beliefs by using operational instead of epistemological definitions. Followed to this, Hutner & Markman (2016) state a new definition of belief: "A mental representation that influences the practice of a teacher if and only if the belief is active in cognition". Before Hutner, et al. (2016) postulate a new definition of beliefs, more than a decade ago, Borg (2001) reckon that teachers' belief is "a proposition which may be consciously or unconsciously held, is evaluative in that it is accepted as true by the individual, and is therefore imbued with emotive commitment; further, it serves as a guide to thought and behavior''.

According to (Schultz et al., 2004 as cited in Le Hebel, Montpied, & Fontanieu, 2014) environmental attitude refers to "the collection of beliefs, affect, and behavioral intentions a person holds regarding environmentally related activities or issues". From this definition, students' environmental attitudes may be related to how pupils' beliefs and actions towards the environment.

"The curriculum is the plans made for guiding learning in the schools, usually represented in retrievable documents of several levels of generality, and the actualization of those plans in the classroom, as experienced by the learners and as recorded by an observer; those experiences take place in a learning environment that also influences what is learned". The unsupported curriculum term in this essay means that there is a discrepancy in curriculum with teachers' role along with students' needs.

The next heading will discuss the challenges and be followed by a recommendation and conclusion, respectively.

## MATERIALS AND METHOD

The present study employs a narrative review methodology to examine a selection of pertinent academic papers. The review primarily concentrates on information pertaining to the significant challenges faced by teachers when implementing the concept of nature-based education among secondary school students in Indonesia. It aims to compare and summarize the entirety of the research conducted on this topic. The articles were obtained from reputable journal platforms, including Google Scholar, Elsevier, and Research Gate, accounting for approximately 80% of the collected literature. The inclusion criteria for the selected articles were as follows: (i) indexing in reputable journals, (ii) open access availability, (iii) availability of full-text versions, and (iv) publication within the last three years. To analyze the data, the Miles and Huberman model was employed, encompassing data reduction, data presentation, and drawing conclusions, which facilitated the creation of a comprehensive and valuable research output. This approach aimed to enhance our understanding of the general implementation of nature-based education within Indonesia's secondary school curriculum, as well as its practical applicability in specific contexts.

## RESULT AND DISCUSSION

### Challenges of Teachers Implementing Nature-Based Education Concept on Secondary School Students in Indonesia

1. Challenges from Teacher's Psychological Aspect: Teacher's Beliefs

As delineated in the introduction, teachers' beliefs may be played a crucial role in controlling teachers' points of view towards their class. Based on Borg (2001), it is an

inseparable between beliefs in teaching and life context in assisting one to perceive the world and controlling the information transmitted. Consequently, teachers' beliefs may potentially affect how educators think and react toward the curriculum and their students and become one of the major challenges that can deter the implementation of nature-based learning in secondary high schools in Indonesia due to the unfamiliar concept. Through this subheading, I will elaborate on the evidence proved by various research studies as well as its contra findings.

In adapting and adopting new learning, nature-based education, in this case, is not an easy task because the shifting from the conventional classroom practice to environmental-based class seems impossible to conduct. The change may be struck with the existing beliefs of educators and generate resistance, misinterpretations, and uncertainty toward the reformation (Brighton, 2003). Beliefs are one of the crucial factors in order to achieve the measures for helping prospective and in-service teachers in designing classroom practice and developing their thinking processes (Richardson (1996).

Another piece of evidence comes from Brighton (2003), as she examined the 48 middle school teachers in two states of Virginia and resulted in the pervasive beliefs that respondents hold. Teachers have the inclination to adjust their experiences to align with their preconceived beliefs in teaching and learning contexts. Thereby, an interesting finding of Brighton (2003) states that the great disparity of success in a class between teachers depends on the alignment of teachers' preexisted beliefs along with academic diversity understanding. Teachers whose has these criteria are prone to success, and vice versa.

Another study conducted by Richardson (1996) on 76 preservice teachers in Turkey showed that incoming preservice teachers have conventional teaching beliefs but they changed over time due to the experiences and development program. Moreover, Richardson (1996) states that a number of studies demonstrate the significant relationship between teachers' beliefs in teaching and learning contexts and the various experiences teachers pose. Given this, teachers' beliefs exist and may drive teachers' attitudes toward their practical actions. Additionally, a research study conducted by Nespor (1987, as cited in Mansour, 2009), found an interesting fact that teachers' beliefs may outpower teachers' knowledge relating to the teaching process, nevertheless, they share similar intelligence in their area of expertise.

Evidence is also found by qualitative and quantitative research done by Roehrig, Kruse, & Kern (2007) on 27 chemistry teachers in secondary science classes, who found that the applicability of reform-based chemistry curricula has greatly impacted teachers' beliefs in relation to teaching and learning activities.

However, the converse argument was found through a research study conducted by Wen, Elicker, & McMullen (2011). Assessing self-reported curriculum beliefs using an instrument called TBS which is claimed as the actual assessment tool by the authors, the scale purpose is to measure the association between teachers' curriculum beliefs with curriculum objectives. Apparently, the empirical evidence found by Wen and colleagues (2011) delineates the less significant correlations between these terms. Furthermore, Wen, et. al (2011) assert that teachers' beliefs and practices are connected contextually. As a consequence, the bond between them is weak and demanding in the context setting.

Based on Wen et al. (2011) conclusion, conversely, Hutner et al. (2016) explain this phenomenon by stating that as one of the forms of mediating representations, to be involved in a cognitive process, a belief should be currently active for several reasons. Firstly, due to beliefs and experiences in the past cognitive mechanism. Secondly, as a result in relation and applicability between active representation that active (Eitam & Higgins, 2010; Kahneman, 2003 as cited in Hutner, et al., 2016). Given this, teachers' beliefs in Wen's may be potentially weak because the beliefs are not active when the interview is conducted. Echoed this, Shulman (1987 as cited in Mansour, 2009) asserts that teachers' beliefs are originated from four initial aspects namely the compilation of knowledge, structures, and material of education, teachers'

education background, and practical experience. To conduct an investigation about beliefs, the researcher should be taken into account these factors to get an optimum result.

In Indonesia, it is pervasive that teachers have conventional teaching beliefs. The new idea of outdoor learning may drive teachers to have a bit of disturbance towards their beliefs at the onset. However, echoed Richardson (1996), experiences that teachers have may be shifted due to the applicability of nature-based education as long as there is a developmental program for teachers in this new concept of learning. As a consequence, the government's role is highly on demand to host and support the program. All in all, looking at the crucial role teachers' beliefs poses, it is potentially influenced the implementation of outdoor learning concept in secondary school in Indonesia.

2. Challenges from Student's Factor: Students' Environmental Attitude

Izadpanahi and Tucker (2018) postulate a tool called NEP (Children@School) to assess the relationship between physical school building towards students' environmental attitudes in seven schools in Victoria, Australia, comprises of four conventionally designed and three schools support highly environmentally sustainable designs (ESD) features integrated into the lesson. With 624 students involved in the survey, Izadpanahi and Tucker (2018) indicate that learners who belong to sustainably designed schools are highly likely to possess more pro-environmental behavior compared with that of the traditionally designed schools. Furthermore, Izadpanahi and Tucker (2018) claim that this tool has broader applicability including the Indonesia setting.

This is highlighted by Koutamanis and Konings (2017) that encouraging teachers and learners to participate in the designing process of a school building can positively promote the association between educational objectives and policy as well as the learning environment. It is proved that the green school can contribute toward influencing students' environmental setting concluding the health, attitude, social, and spiritual of students (Bell and Dyment, 2008). Furthermore, the idea of green school buildings can generate a chance for learners to live sustainable lives on a daily life school basis (Cole, 2013).

However, although several research studies indicate that the presence of epitome, outdoor activities, and pro-environmental behavior through media promoting may achieve strong life experience, Stevenson et al. (2014) has different result study from the prevalence findings through random sampling upon middle school learners in North Carolina, the USA.

Surprisingly, Stevenson et al. (2014) found that environmental behavior has a significant relation with learners and teachers ratio and income levels, instead of common aspects of beliefs mentioned above. To be specific, the existence of role models and long exposure to the outdoor world are weakly correlated with students' environmental attitudes, while a negative correlation is found in watching environmental programs on television. Apparently, Stevenson et al. (2014) claim that experiences in the natural environment directly may be less important to construct children's environmental attitudes compared with the implementation of small-size classrooms and focus on lower earnings students' family backgrounds.

Refute to the Stevenson et al. (2014) findings, a children's television series called Si Bolang (Adventurous Boy) showed the different impacts of time outdoors on children. Rural areas of Indonesia where the family with low to moderate economic backgrounds lies, and students live side by side with nature, evidently can promote pro-environmental behavior due to direct contact with nature.

This is supported by, Chawla (2018) claims that her study in nature-based learning is largely fit regardless of parents' and students' status (economic, educational, racial, and cultural aspects) as well as school scope. In other words, nature-based learning could bridge the inequality between students who are more and less in terms of economic aspects which resembles mostly Indonesian.

Apparently, given several pieces of evidence in various countries, Chawla (2018) reiterates the NEP (Children@School) instrument stated by Izadpanahi and Tucker (2018) which is highlighted the pivotal role of

school building environment upon students' performance towards nature-based education which is important to assume that this is likely one of the teachers' major challenge as the fact that Indonesian school buildings are conventionally built.

3. Challenges from Curriculum Side: Unsupported Curriculum

It is largely believed that nature-based education resides under the science context. However, several investigations below indicate the reverse. In a research study conducted by Casinader and Kidman (2018) contend that sustainability and environmental education are appropriately embodied in the Geographical domain, rather than that of science integrated curriculum. These researchers highlight that the general curriculum tends to employ sustainability education in inquiry-based learning which does not encompass the full scope idea of environmental education as a whole, whereas that of geography held. To exemplify, the researchers present evidence that focuses on the Australian Curriculum, which is sustainability education lies on one of three mandatory cross-curriculum priorities (CCP). Such a curriculum then demonstrates teaching across different disciplines. The authors highlight that CCP is more attached to the Geographical paradigm by showing the ratio between Geography and Science in a Table called the Learning Areas of Humanity and the Social Sciences (Grades F-10, the Primary School Levels) and Geography (Years 7-10), resulting in almost fivefold greater in geography than that of Science.

Through a research study of pre-service secondary teachers enrolled in Undergraduate Biology Teaching courses, found that the lack of environmental knowledge, despite the emergence of their readiness to teach. Given this, the author encourages to prepare pre-service biology teachers to better understand the environment. Apparently, from this result, biology may lack to encompass all of environmental education.

Implementing environmental education from not professionally suitable teachers will deter the objectives and principles of sustainable development to be acquired Kolenc, (2014), as a consequence of unsupported curriculum. Furthermore, Kolenc (2014) believes that one of the inherent characteristics of geography is the correlation between the natural environment and social aspect needs, which is encompass all the elements of the educational process and transforms into a crucial milestone for changing entire national educational policy. Additionally, the previous year's paper of Kolenc (2009) delineates the essential role that geography teaching in education for sustainable development.

Another perspective, beliefs that science education is strongly related to environmental education. As a consequence, researchers are focusing on Education for Sustainable Development Indicators (ESDI) role to promote science education practices based on the point of view of ESD (Education for Sustainable Development) to incorporate ESD in curriculum setting. However, the geographical framework is more "agricultural" in relation to the nature concept (Nielsen, Harbmeier, & Ries, 2015 as cited in Casinader, & Kidman, 2018). Consequently, only a slight concept of nature-based education embedded in science is being implemented practically. In other words, pedagogical approaches for environmental education have an inclination belief to a standard scientific model for inquiry-based learning (Casinader and Kidman, 2018). This is echoed by Chawla (2018), who reckons that it is not mandatory for teachers in most schools to establish the acidification of the ocean, warming atmosphere, sea level rise, or even environmental action toward human activism.

In Indonesia's context, a brief sustainable development concept is presented by science teachers instead of held by geography teachers. Although environmental education has been implemented holistically in the Indonesian curriculum recently, if we looked back to Casinader and Kidman (2018) suggestions will surely reform the curriculum considerably as well as construct a confusing concept to geography teachers considering to some extent they should implement nature-based education on their own. The curriculum itself will be a significant challenge for science teachers in Indonesia due to the top-down

regulation of the curriculum. Given this, science teachers in Indonesia could only partially implement the nature-based education concept because this is inherently integrated into science pedagogies, not in a geography context. Consequently, the limitation of sustainability education in the curriculum will affect teachers to the inclination to limit their pedagogy regarding the implementation of nature-based education in school. In other words, the nature-based education concept cannot be implemented to the full scope.

**Recommendation**

The idea of sustainable education is not new, but practically, developing country such as Indonesia is still struggling to adopt the concept into classroom practice. According to the previous sub-heading, several recommendations emerge for practice, policymaker, and future research in an educational setting. Through this section, I will explain it subsequently.

Practice: Based on the effect of teachers' beliefs, as the ones who will be in charge to implement curriculum, educators are supposed to alter and control their beliefs into positive ones. Additionally, engaging teachers, students, and environmentalists in a collaborative project may be beneficial to not only the environment but also to enhance students' attitudes towards their natural surroundings and contribute to preserving a greener earth eventually.

Policymaker: Through the possible challenges conveyed by this paper, the government and stakeholders such as the Ministry of Education of Indonesia may acquire the measure to deter and eliminate the cause. As the highest authority as well as a constructor of a curriculum, the government should review the curriculum periodically to answer the need for global challenge and competitiveness for better education in Indonesia. Moreover, the government may cooperate with architects to build school buildings that promote and enhance students' environmental attitudes as mentioned in the previous heading by Izadpanahi and Tucker (2018).

Research: According to the likely fruitful input of this investigation, researchers may use the acquired information as a background or supplement source to their further investigation. Moreover, due to the limitation this essay poses, the investigator may challenge the result to acquire more possible comprehensive results.

## CONCLUSION

The implementation of the concept of nature-based education for high school students in Indonesia faces several challenges. The first challenge is from the teacher's psychological perspective, where teachers' beliefs and understanding can influence their attitudes and actions towards the concept of nature-based learning. Although some studies show teacher beliefs change with experience and program development, there is resistance and uncertainty at first. The second challenge comes from student factors, where students' environmental attitudes can affect their acceptance of nature-based education. Several studies have shown that a school environment that supports sustainability and direct interaction with nature can increase students' pro-environmental attitudes, but there are also other factors that influence these attitudes. The third challenge is the curriculum which does not fully support nature-based education. While several studies point to the importance of sustainable and environmental teaching in the geography curriculum, the curriculum in Indonesia places more emphasis on environmental education in the context of science. This can limit the application of the concept of nature-based education as a whole.

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**Author declaration**

**Author contributions and responsibilities**

The authors made major contributions to the conception and design of the study. The authors took responsibility for data analysis, interpretation, and discussion of results. The authors read and approved the final manuscript.

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**Competing interests**

The authors declare no competing interests.

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