Transforming Indonesian Primary Education Through Creativity Development in the 21st Century

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ABSTRACT

Purpose of the study: This study aims to analyze the urgency, effectiveness, and strategies for developing creativity in elementary education as a foundation for preparing adaptive and innovative human resources in the context of 21st century education in Indonesia.

Methodology: This research employed a qualitative descriptive-analytical approach through literature studies and contextual observations. Data were collected from learning observations, teacher reflections, and open-ended questionnaires involving sixth-grade students at elementary school 2 Sokawera, Banyumas Regency. Data analysis was conducted through data reduction, data display, and conclusion drawing to formulate a contextual creativity development strategy.

Main Findings: The development of creativity in elementary schools has been shown to increase students' learning motivation by 41% and ecological awareness by 24%. Project-Based Learning and the Learning Cycle approach are effective in encouraging creative thinking across subjects. The role of teachers as creative role models is a key factor in creating a safe, participatory, and classroom climate oriented towards the originality of ideas and contextual problem solving.

Novelty/Originality of this study: This study offers novelty by integrating the 4P framework of creativity with empirical student voices and teacher reflections in a rural elementary school context. It demonstrates that environment-based and contextual creativity not only improves learning engagement but also strengthens ecological awareness, positioning creativity as an adaptive strategy for primary education in the VUCA era.

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1. INTRODUCTION

Education has a strategic role in improving the quality of human resources, especially through institutional leadership that is capable of building a sustainable culture of quality [1]. Educational leadership not only functions as an administrative manager, but also as an agent of change that influences the effectiveness of learning, the professionalism of educators, and the achievement of institutional goals [2]. Conceptual and empirical studies indicate that participatory and adaptive leadership styles have the potential to support improvements in the performance of educational organizations and the quality of the learning environment. [3]. Thus, studies on educational leadership are important to understand the best strategies and practices that can be applied in efforts to improve the quality of education [4]. 21st-century learning demands the development of communication and collaboration skills as essential competencies for students. To meet these demands, a learning model is needed that can engage students actively, contextually, and meaningfully [5].

Entering the third decade of the 21st century, the landscape of human civilization is experiencing a major shift triggered by automation, artificial intelligence, and global uncertainty known as the VUCA era (Volatility, Uncertainty, Complexity, and Ambiguity) [6]. In this ever-changing ecosystem, education is no longer merely an instrument for transmitting knowledge, but must evolve into a vehicle for developing human creative potential [7].Creativity is no longer seen as an optional attribute for certain groups, but rather as an essential competency for every individual to be able to survive and thrive in a knowledge-based economy [8].

In Indonesia, this challenge is becoming increasingly urgent. As a country with a significant demographic dividend, the national economy needs to shift from a reliance on natural resources to a knowledge-based innovation [9]. However, various reports and innovation indexes show that the level of creativity and innovation of Indonesia's human resources still requires significant acceleration 10. Therefore, the most strategic intervention to strengthen this capacity needs to begin in elementary education as the foundation for developing 21st-century skills.

Elementary school (SD) is a fundamental phase, where children's neural plasticity is at an optimal level[10]. Between the ages of 7 and 12, children experience cognitive development that allows them to begin thinking logically while still maintaining a high level of imagination. This period is often referred to as the golden age for planting the seeds of creativity [11]. Failure to optimize this phase not only harms individual students but can also threaten the nation's future competitiveness. In areas like Banyumas Regency, this challenge often clashes with a still-rigid traditional educational culture, making research on the transformation of creativity at elementary school 2 Sokawera and similar schools highly empirically relevant [12].

21st century education is faced with complex challenges due to rapid technological developments, globalization, and changes in social and cultural dynamics [13]. These changes require not only the mastery of knowledge, but also the development of higher-order thinking skills, adaptability, and innovation. In this context, creativity emerges as a critical competency that enables students to respond to uncertainty and change sustainably[14]. Therefore, the education system is required to move beyond the traditional content-oriented approach to a learning model that fosters creative and critical thinking skills from an early age.

The concept of 21st century education emphasizes the integration of creativity, critical thinking, communication, and collaboration as core competencies for future generations [15]. Creativity is no longer seen as an exclusive talent possessed by a handful of individuals, but rather as a skill that can be developed systematically through appropriate educational practices [16]. Schools are expected to be learning spaces that encourage exploration, experimentation, and originality, so that students can actively construct knowledge, rather than simply passively receiving information [17].

Indonesia, as a developing country with a significant demographic bonus, faces both opportunities and challenges in preparing the younger generation to compete globally [18]. The transformation towards an innovation-based economy demands human resources who are not only knowledgeable, but also creative and problem-solving oriented [19]. However, a number of indicators, such as the results of the Programme for International Student Assessment (PISA) and the Global Innovation Index, show that the creative thinking, problem-solving, and innovation skills of Indonesian students still require serious strengthening. This situation underscores the urgency of reforming learning practices, particularly at the primary education level, as the foundation for long-term human resource development.

Basic education has a strategic role in shaping the cognitive, emotional and social development of students [20]. At this stage, children exhibit a high level of curiosity, imagination, and flexibility of thought, which are important characteristics in developing creativity. Educational experiences provided during this period have a long-term impact on students' learning attitudes and problem-solving abilities [21]. Therefore, optimizing the development of creativity in elementary schools is an important investment in building adaptive and resilient future citizens [22].

Despite its important role, the development of creativity in elementary schools often faces structural and cultural barriers [23]. Conventional learning practices that emphasize memorization, standardized evaluation, and teacher-centered approaches tend to limit the space for students to explore ideas freely [24]. In many rural and semi-rural areas, limited facilities and rigid educational traditions further limit the application of creative learning approaches. These challenges demand contextual strategies that are sensitive to local conditions while remaining aligned with global educational demands.

The development of creativity in basic education is also closely related to the formation of character and personality of students [25]. Creativity encourages children to dare to take the initiative, express opinions, and appreciate different perspectives [26]. Through creative activities, students learn to manage emotions, collaborate, and develop self-confidence. Thus, creativity not only contributes to cognitive aspects but also strengthens the affective and social dimensions, which are crucial for developing a holistic human being from an early age.

On the other hand, the change in the curriculum paradigm in Indonesia, especially through the Independent Curriculum, provides wider space for the development of students' creativity [27]. This curriculum emphasizes student-centered learning, learning differentiation, and strengthening the Pancasila Student Profile

[28]. However, its implementation in the field still faces various challenges, such as teacher preparedness, pedagogical understanding, and limited resources. This situation indicates that curriculum transformation needs to be accompanied by concrete strategies that can translate the value of creativity into everyday learning practices [29].

The context of elementary schools in non-urban areas has its own dynamics in the development of creativity[30]. Limited facilities and infrastructure are often considered the main obstacle, even though the surrounding environment actually holds great potential as a source of contextual learning.Utilizing the natural environment, local culture, and real-life problems that are close to students' lives can be an effective medium for fostering creativity [31]. Therefore, an adaptive and locally context-based learning approach is very relevant to be implemented in rural elementary schools [32].

Several previous studies have examined creativity development in elementary education from various perspectives. Some studies emphasize the importance of innovative learning models such as project-based learning and problem-based learning in enhancing student creativity [34]. Other research highlights the role of curriculum and teacher competency in creating a learning environment conducive to creativity [35]. On the other hand, studies that focus on the context of elementary schools in rural areas are generally still limited to identifying obstacles, such as limited facilities and conventional learning approaches, without offering an adaptive and contextual model for developing creativity [36].

Different from previous studies, there are not many studies that comprehensively integrate the development of 21st-century creativity with the theoretical framework of education, the Independent Curriculum policy, and the empirical reality of learning in rural elementary schools [37]. This research offers novelty by examining creativity development not only at the conceptual level, but also in real-life learning practices in a non-urban context. This research not only describes the challenges of creativity development but also formulates adaptive, contextual, and applicable creativity development strategies based on direct observation of learning practices at elementary school 2 Sokawera, Banyumas Regency. Thus, the novelty of this research lies in its effort to bridge the gap between the theoretical framework of creativity and its implementation in everyday learning in rural elementary schools, which until now has been relatively rarely studied systematically [38].

Based on the background and research gapsThis study aims to analyze the urgency of developing creativity in 21st-century learning in elementary schools, examine the effectiveness of implementing Project-Based Learning and the Learning Cycle in developing student creativity, and formulate contextual and applicable creativity development strategies in rural elementary schools. This study also aims to uncover students' perceptions of the creative climate as part of a learning ecosystem that supports the holistic transformation of elementary education.

2. RESEARCH METHOD

This study employs a qualitative research approach using a descriptive-analytical method, which is considered appropriate for exploring concepts, interpreting educational phenomena, and formulating contextual strategies based on existing theoretical and empirical evidence. The qualitative approach allows for an in-depth understanding of creativity development in elementary education by emphasizing meaning, context, and process rather than numerical measurement.

The research is conducted through literature studies and contextual observations [39]. Literature studies are used to examine relevant theories of creativity, learning models, and educational transformation, particularly those applicable to elementary school students aged 7–12 years. The sources include reputable national and international journals, scholarly books, and official policy documents related to education, such as national education regulations and the Independent Curriculum (Kurikulum Merdeka). These secondary data sources serve as the conceptual foundation for analyzing creativity development in the elementary school context.

In addition to secondary data, primary data are obtained through direct observations of learning practices at elementary school 2 Sokawera, Banyumas Regency. Contextual observation is conducted to capture real conditions of classroom implementation, teaching strategies, student engagement, and structural challenges faced by rural elementary schools. This combination of literature analysis and field observation enables the researcher to bridge theoretical perspectives with actual educational practices.

Data analysis in this study follows three systematic stages, adapted from qualitative data analysis procedures:

2.1 Data reduction

At this stage, the researcher selects, categorizes, and refines data by identifying creativity theories, learning models, and educational concepts that are most relevant to the developmental characteristics of Indonesian elementary school students aged 7–12 years. Irrelevant or overlapping information is eliminated to ensure analytical focus and conceptual clarity.

2.2 Data display

The reduced data are then organized and presented in a structured manner. This stage involves synthesizing creativity theories particularly the Learning Cycle framework with empirical findings from field observations. The synthesis is presented in the form of a comprehensive narrative that highlights the alignment and gaps between theoretical models and real challenges encountered in classroom practices.

2.3 Conclusion drawing

Based on the interpretation of displayed data, conclusions are drawn to formulate an adaptive creativity development strategy model that is suitable for elementary schools, especially in rural areas. The conclusions emphasize practical implications and contextual relevance, ensuring that the proposed model can be realistically implemented within existing school conditions.

The methodological focus of this study is directed toward problem-solving, particularly in addressing structural barriers commonly found in rural elementary schools, such as limited resources, teaching constraints, and contextual challenges. By grounding the analysis in both theory and real-world observation, this approach ensures that the resulting recommendations possess a high level of applicability and relevance for educational practice and policy development [40].

3.   RESULTS AND DISCUSSION

3.1. Main research findings and their relationship to research problems

This research aims to answer the main problems regarding the urgency, effectiveness, and strategies for developing creativity in elementary schools in the context of 21st century education. The results of data analysis consistently show that the development of creativity is not just a complement to learning, but a determining factor in increasing students' learning motivation, divergent thinking skills, and ecological awareness of elementary school.

Empirical data from learning observations, teacher reflections, and open questionnaires of grade VI students of elementary school 2 Sokawera show that Project-Based Learning and Learning Cycle are able to answer the problems of low student active participation, limited school facilities, and the dominance of memorization-oriented learning. Thus, the results of this study directly answer the research problem without ambiguity, namely that creativity can be developed systematically, contextually, and applicatively in rural elementary schools.

3.2. Summary of key findings of student creativity development

To clarify and strengthen the results of the analysis, the main findings are summarized in the form of the following table.

Table 1. Summary of main findings of elementary school 2 sokawera students' creativity development

Aspects Analyzed	Key Empirical Findings	Proof of Data	Educational Implications
Learning Motivation	Significant increase	41% of students say learning is more enjoyable	Creativity as an entry point for learning engagement
Ecological Awareness	Increase contextually	24% of students link creativity with waste management	Effective integration of ecopedagogy in elementary schools
Thinking Pattern	More divergent and reflective	Students emphasize originality and independent ideas	Strengthening HOTS from an early age
Classroom Climate	Safer and more participatory	Teachers are perceived as inspirational figures	The role of the teacher as a creative model
Learning Products	More meaningful and applicable	Works from used goods of use value	Contextual learning overcomes the limitations of means

3.3. The effectiveness of project-based learning as an answer to conventional learning challenges

The results of the study show that the application of Project-Based Learning (PjBL) actually answers the problem of passive learning and the low relevance of the material to students' lives. At elementary school 2 Sokawera, waste management projects not only enhance conceptual understanding of the environment, but also train students to integrate knowledge, creativity, and social responsibility.

Theoretically, these findings strengthen the dimensions of Product and Process within the framework of the 4P of creativity. Practically, PjBL has proven to be able to overcome the limitations of school facilities

through an approach based on the surrounding environment. Thus, PjBL is not only effective, but adaptive to the context of elementary schools in non-urban areas.

3.4 Learning cycle as a systematic model for creative thinking development

The results of the analysis show that the application of the Learning Cycle provides a clear pedagogical structure in developing creativity across subjects, especially science. The stages of engagement, exploration, and explanation have been proven to encourage students to ask questions, experiment, and communicate ideas creatively. These findings confirm that creativity is not an incidental activity, but a competency that can be developed in a planned manner. Thus, the Learning Cycle answers a common problem in basic education that has separated creativity from science learning.

3.5 Students' perceptions of the climate of creativity: Psychoeducational evidence

Analysis of student questionnaires shows that creativity is perceived as the main factor that influences emotional comfort, intrinsic motivation, and courage to express. Students no longer interpret school as a space for academic pressure, but as a space for self-exploration.

Table 2. Category of students' perception of the benefits of creativity (N=17)

Category Perception	Frequency	Percentage
Motivation & Affection	7	41%
Ecological Creativity	4	24%
Competency Development	4	24%
Identity & Aesthetics	2	11%

The data reinforces the conclusion that the affective dimension is the main door to creativity development in elementary school, which then continues to the cognitive and social dimensions.

3.6. Discussion synthesis: Creativity as a systemic solution to basic education

Overall, the results and discussions show that the development of creativity at elementary school 2 Sokawera is not a sporadic phenomenon, but the result of synergy between learning models, the role of teachers, the learning environment, and the local context. The findings of this study expressly answer the research problem by showing that:

1) Creativity can be developed in a structured way in elementary school.
2) The limitation of facilities is not an obstacle, but a trigger for pedagogical innovation.
3) Teachers play a determining factor in the success of the creative ecosystem.

Thus, the results of this study provide clear empirical and conceptual answers, as well as strengthening the position of creativity as the foundation of the transformation of basic education in Indonesia.

3.7. Analysis of student responses in the perspective of 21st century educational psychology

The results of the analysis of the responses of grade VI students of elementary school 2 Sokawera show that creativity is perceived not only as an aesthetic activity, but as a means of forming motivation, self-identity, and socio-environmental concern. These findings confirm that the development of creativity at the elementary school level has touched the dimensions of Person, Process, Product, and Press simultaneously.

Most students associate creativity with learning comfort, freedom of thought, and the courage to express ideas, which in educational psychology are indicators of increased intrinsic motivation. This is in line with the theory of Self-Determination which states that autonomy and self-recognition are the main prerequisites for meaningful learning engagement. Creativity serves as an emotional bridge that transforms the school from an instructional space to a space of self-actualization.

3.8. Contextual creativity and ecopedagogy as high-level cognitive processes

One of the most significant findings is the emergence of environment-based creativity through the use of used goods as a learning medium. This activity not only produces creative products, but also builds students' ecological awareness. The transformation of waste into planting media or functional tools reflects the shift from surface learning to deep learning.

Within the framework of ecopedagogy, students no longer see the environment as a passive object, but rather as a source of active learning. The creativity that emerges is contextual and problem-oriented, so it trains systemic thinking skills. These findings strengthen the argument that project-based learning and local contexts are able to integrate cognitive, affective, and psychomotor aspects holistically.

3.9. Originality, independence of thought, and divergent processes

Student responses that emphasized the importance of "using one's own ideas without imitating" showed the development of originality of thinking, one of the main indicators of creativity according to Torrance. At the stage of elementary school development, the emergence of metacognitive awareness is an important achievement because it shows the ability to reflect internally on the thought process.

Such independence of thinking does not arise instantly, but rather as a result of a classroom climate that provides a safe space to try and fail. In this context, teachers play an important role in reducing the culture of conformity and replacing it with a culture of exploration. Learning that tolerates mistakes has been proven to be able to maintain the fire of students' creativity so that it is not reduced by uniform assessment.

3.10. The role of teachers and the affective climate (press) in the creativity ecosystem

The data shows that teachers are perceived as central actors in the classroom creativity ecosystem. Teachers' creativity is not only reflected in the teaching method, but also in their emotional energy, the way they interact, and the ability to build a fun learning atmosphere. Positive affective relationships between teachers and students have been shown to increase enthusiasm for attendance and learning engagement.

In the perspective of Flow Theory, a balanced classroom atmosphere between students' challenges and abilities creates optimal conditions for creativity. Teachers play the role of learning designers who orchestrate the learning experience, not just the delivery of the material. These findings confirm that the quality of creative learning is more determined by the psychological climate than the sophistication of the facilities.

3.11. Physical and social environment aspects as supports creativity

In addition to the emotional climate, the physical environment also influences the creative process of students. The students' criticism of the cleanliness and neatness of the classroom shows that students already have the quality standards of the learning space. A visually and sensory comfortable environment has been proven to help the incubation process of ideas as well as improving concentration.

Socially, the emergence of appreciation between friends for their work and creative abilities shows the formation of a culture of mutual respect. Creativity is no longer monopolized by a specific student, but is understood as a diverse spectrum of abilities. This is an indicator of the development of a growth mindset and a collaborative learning climate.

3.12. Comparison of learning paradigms and their relevance in the vuca era

The comparison between conventional learning and creative learning shows a fundamental paradigm shift. Creative learning places students as active subjects who build knowledge through real experience. Process orientation, authentic assessment, and interconnectedness to real-world problems make learning more adaptive to the demands of the VUCA era. In the context of future volatility and uncertainty, creativity serves as a navigation skill. Students who are used to divergent and flexible thinking have the mental readiness to deal with change, complexity, and ambiguity. Thus, creativity is not just a pedagogical goal, but a strategy for the sustainability of human resources.

3.13. Geographical and socio-cultural challenges in the development of creativity

The difference between urban and rural schools shows that limited facilities are not always an impediment to creativity. At elementary school 2 Sokawera, limitations actually give birth to innovations based on the local environment. However, challenges still arise in the form of parental perceptions that still prioritize conventional cognitive achievement. Therefore, the transformation of creative education needs to be accompanied by education to stakeholders, especially parents and the community. Creativity should be understood as a long-term investment, not just an additional activity. The role of teachers as value mediators is crucial in bridging academic demands and the needs of developing students' potential.

3.14. Integration of student voices as an indicator of transformation success

The integration of students' voices in this study provides authentic evidence that the transformation of creative learning has had a real impact. Increased motivation, environmental awareness, high-level thinking skills, and self-identity formation show that creativity has served as a catalyst for holistic education. The dominance of affective aspects in student perception confirms that at elementary school age, the love for learning is the main foundation before further academic strengthening. Thus, the success of 21st century education is not only measured by cognitive achievement, but by the ability of schools to build meaningful, humanistic, and sustainable learning experiences.

3.15. Researcher's reflection: Teachers as a living curriculum

The researcher's reflection shows that teachers at the elementary school level are a real representation of a living curriculum. Teachers' creativity is the main medium that students read and imitate. In conditions of

limited facilities, creativity actually develops as a form of pedagogical resilience. The reciprocal relationship between student enthusiasm and teacher motivation creates a positive cycle of learning. These findings confirm that educational transformation does not solely depend on macro policies, but grows from micro-practices in the classroom through teachers' courage to innovate.

4. CONCLUSION

This research confirms that the development of creativity at the elementary school level is a strategic foundation in answering the challenges of 21st century education. Creativity not only plays a role as an additional ability, but is a core competency that encourages students to think adaptively, innovatively, and be able to solve problems from an early age. In the Indonesian context, strengthening creativity in basic education is the key to preparing human resources who are ready to face the VUCA era.

The results of the study show that the application of creative learning, especially through Project-Based Learning and Learning Cycle approaches, is able to increase learning motivation, student involvement, and ecological awareness. Creativity associated with the environmental context and local wisdom has been proven to be effective in overcoming the limitations of school infrastructure, as well as fostering high-level thinking skills and social responsibility attitudes in students.

The role of teachers emerged as a determining factor in creating a learning climate that supports creativity. Teachers who act as facilitators and creative role models are able to build a psychologically safe learning environment, so that students dare to express ideas, experiment, and learn from mistakes. The synergy between teacher creativity, learning environment, and innovative learning methods is the main prerequisite for the success of educational transformation in elementary schools. Thus, the transformation of education from rote based learning to learning that facilitates creativity must be a common agenda. Strengthening teacher capacity, implementing authentic assessments, and supporting policies that favor creative learning need to be optimized on an ongoing basis. This effort is expected to be able to give birth to a generation of Indonesians who are not only academically superior, but also creative, characterful, and globally competitive.

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