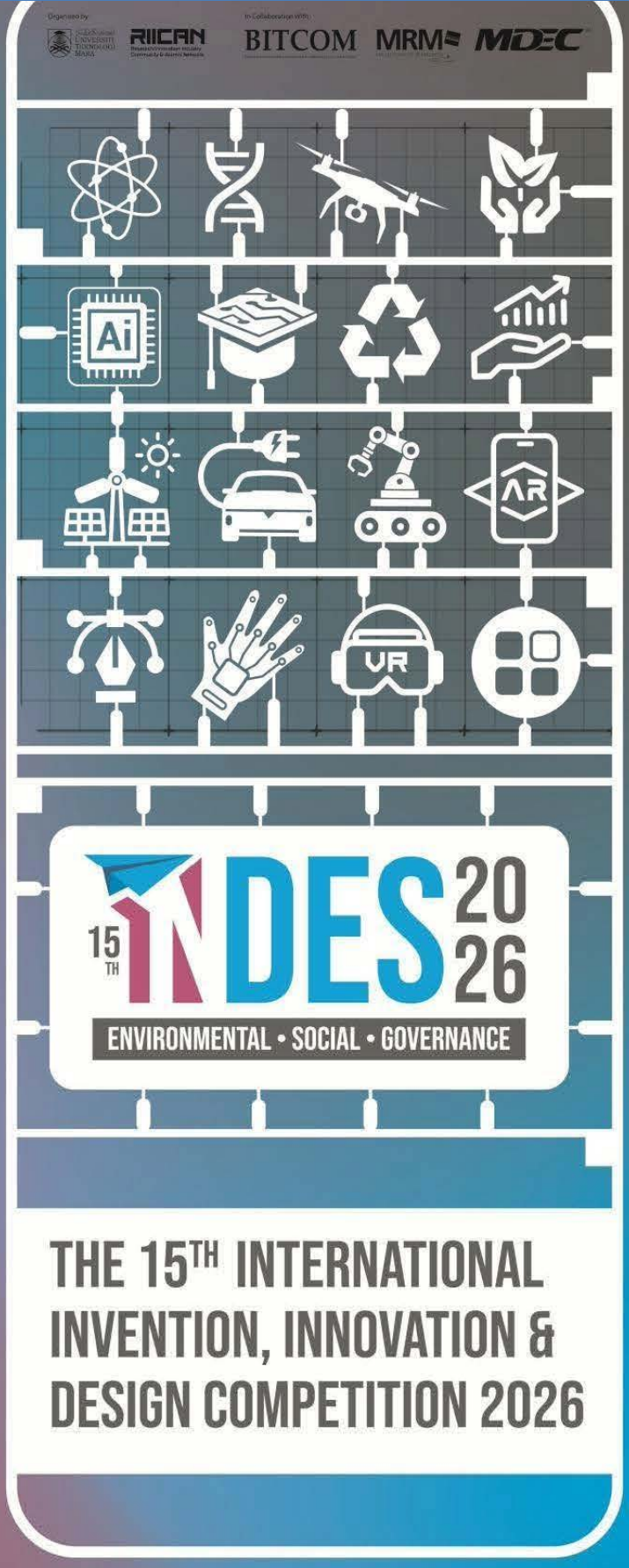


E-BOOK OF

EXTENDED ABSTRACT

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THE 15th INTERNATIONAL
INVENTION, INNOVATION &
DESIGN COMPETITION 2026

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ECOPRINT LAB: ZERO-WASTE PRINTMAKING KIT FOR CREATIVE LEARNING

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ABSTRACT

This study introduces EcoPrint Lab, a zero-waste printmaking kit designed to promote sustainable creative learning in educational settings. The research evaluates the extent to which the kit enhances students' creativity, environmental awareness, and participation through eco-friendly art techniques. A primarily qualitative approach was employed, involving observations and reflective feedback from students during organized printmaking workshops. Participants engaged with EcoPrint Lab through guided activities that used biodegradable inks, reusable printing plates, and upcycled materials. The results show that using EcoPrint Lab significantly improved students' creative thinking and problem-solving skills, especially as they adapted to unconventional materials and methods. Observation data indicated that students remained actively engaged, collaborated effectively, and eagerly explored new ideas throughout the learning process. Furthermore, reflective responses demonstrated an increased understanding of sustainability concepts, particularly in relation to waste reduction and responsible material use. The discussion emphasizes that integrating zero-waste design into art education decreases environmental impact and enhances teaching outcomes by fostering innovation and ecological awareness. Challenges identified include the variability of natural materials and the need for clearer instructional guidance. Overall, the study concludes that EcoPrint Lab is a valuable educational resource that combines creative practice with sustainability efforts and serves as a practical example of environmentally conscious art education.

Keyword: Zero Study Printmaking, Sustainable Art Education, Creative Learning, Experiential Learning, Environmental Awareness

1. INTRODUCTION

In the 21st century, sustainability has become a key global issue that impacts policies, industries, and education. Growing concerns about climate change, environmental damage, and resource depletion have prompted educators to rethink how they teach knowledge and skills across various subjects. UNESCO's Education for Sustainable Development (ESD) aims to equip learners with the tools they need to address complex environmental challenges and make responsible choices (UNESCO, 2017). In this context, art education plays a unique role by fostering creativity and allowing learners to critically analyze social and environmental topics through hands-on methods. Printmaking, a traditional visual art technique, is valued for its flexibility, reproducibility, and experimental possibilities. However, traditional printmaking often involves toxic chemicals, synthetic inks, and non-biodegradable materials,

which threaten health and the environment (Anderson, 1991). Materials such as oil-based inks, solvents, and chemically treated plates can generate hazardous waste and pollution if not properly managed. Consequently, there is an increasing need to adapt printmaking practices in educational settings to align with sustainability principles. This shift reflects broader trends in eco-art and sustainable design that focus on minimizing waste, using natural or recycled materials, and adopting environmentally friendly production methods (Peterson, 2004).

Sustainable art education has become essential, combining environmental awareness with creativity. As Inwood (2010) observers, the researcher integrates sustainability into art education to help students develop ecological literacy through meaningful artistic processes. This approach values not only the final artwork but also the methods and materials used, fostering a deeper sense of environmental responsibility. It also aligns with constructivist and experiential learning theories, which emphasize learning through direct experience, reflection, and active participation. According Kolb, (1984) experiential learning involves acquiring knowledge through cycles of concrete experience, reflective observation, abstract thinking, and active experimentation. In art education, printmaking offers an excellent platform for experiential learning because it involves hands-on engagement, iterative steps, and creative problem-solving. When combined with sustainable practices, experiential learning enhances students' understanding of environmental issues by enabling them to work directly with eco-friendly materials and techniques. Creative learning, a vital component of modern education, promotes innovation, exploration, and critical thinking. Robinson (2015), notes that creativity is an essential skill for adapting to rapidly changing, complex environments. In art, nurturing creative learning involves encouraging students to experiment with a range of materials, techniques, and ideas. Using sustainable materials like natural dyes, recycled surfaces, and found objects can expand creative possibilities while boosting environmental awareness. Constraints imposed by eco-friendly materials often spark innovative thinking, as students must adapt their methods and expectations to meet their goals.

Despite the theoretical connections between sustainability, experiential learning, and creative education, effective practical tools for integrating these elements in classrooms are limited. Many educators face barriers, including limited access to sustainable materials, insufficient training in eco-friendly techniques, and a lack of instructional resources. These challenges lead to inconsistent or superficial implementation of sustainable practices in art education. To address this, there is a need for developing structured, accessible, and pedagogically sound tools to help educators and students adopt sustainable creative methods. The EcoPrint Lab: Zero-Waste Printmaking Kit for Creative Learning offers an innovative solution. It is designed to facilitate printmaking using biodegradable inks, reusable plates, and upcycled materials, minimizing environmental impact while maintaining educational value. With guided activities and flexible resources, EcoPrint Lab enables teachers and students to meaningfully engage with sustainable art practices. It also encourages learners to explore the relationship between art, materials, and the environment, fostering both creative expression and ecological awareness.

This study evaluates the effectiveness of the EcoPrint Lab as an educational tool in art classrooms. It investigates how zero-waste printmaking materials influence students' creativity, experiential learning, and environmental consciousness. The research also considers whether the kit can serve as a scalable, adaptable model for sustainable art education across diverse learning environments. By positioning EcoPrint Lab within the broader scope of sustainable education and innovative teaching methods, this study aims to expand understanding of environmentally mindful teaching. It emphasizes the potential of integrating sustainability into artistic activities, not only to lower environmental impact but also to enhance learning and foster environmentally aware, creatively empowered individuals.

2. METHODOLOGY

2.1 Research Design

This study uses a qualitative research design to evaluate the effectiveness of the EcoPrint Lab: Zero-Waste Printmaking Kit for Creative Learning. A qualitative approach is well-suited here as it allows for detailed exploration of students' experiences, behaviors, and interactions within a natural learning setting. Instead of relying on numerical data, this method focuses on understanding the meaning and processes behind students' creative engagement and environmental consciousness. Data collection mainly involved systematic observation, enabling the researcher to closely examine students' creative processes, engagement levels, and reactions to eco-friendly materials during printmaking workshops. These observations were conducted non-intrusively to maintain natural and authentic behaviors. Detailed field notes documented important actions, interactions, and patterns. Additionally, the study gathered reflective responses from participants, giving deeper insight into their thoughts, feelings, and understanding of their learning experiences. This helped to assess the impact of the EcoPrint Lab on both creativity and environmental awareness. The collected data were analyzed using thematic analysis, where recurring patterns and key themes were identified and organized. Through this approach, the study generated rich, descriptive findings that reflect the complexity of creative learning in a sustainable context. Overall, the qualitative methodology adopted in this study provides a holistic understanding of how students interact with the EcoPrint Lab. By emphasizing observational and reflective data, the research highlights students lived experiences and the dynamic nature of their engagement with sustainable art practices, offering meaningful insights into the integration of eco-friendly approaches in art education.

3. FINDINGS

The research on EcoPrint Lab: Zero-Waste Printmaking Kit for Creative Learning found that the kit successfully supports sustainable and creative learning in art education. The study involved ten Fine Arts students from Universiti Teknologi MARA Seri Iskandar and used qualitative methods such as observation and reflective feedback to evaluate students' experiences during eco-friendly printmaking workshops. The findings showed that students demonstrated stronger creative thinking and problem-solving skills when working with biodegradable inks, reusable printing plates, and recycled materials. The use of unconventional and natural materials encouraged experimentation, innovation, and process-oriented creativity. Students were highly engaged throughout the workshops, actively collaborating and exploring new artistic ideas. In addition, the study revealed that students developed greater environmental awareness and a better understanding of sustainability concepts, especially regarding waste reduction and responsible material usage. The artworks produced reflected organic and innovative qualities while highlighting sustainable practices in artmaking. Although some challenges were identified, including the unpredictability of natural materials and the need for clearer instructional guidance, the overall findings suggest that EcoPrint Lab is an effective and practical teaching tool that integrates creativity, experiential learning, and environmental responsibility in art education.

4. CONCLUSION

This study evaluated the EcoPrint Lab: Zero-Waste Printmaking Kit to assess its effectiveness in enhancing students' creativity, environmental awareness, and engagement. Conducted with ten students from Universiti Teknologi MARA Seri Iskandar, the study found that the kit effectively integrates artistic exploration with sustainable practices. Students developed stronger creative thinking through

experimentation with eco-friendly materials and hands-on learning. Their environmental awareness also improved, as they became more conscious of waste reduction and sustainable art methods. Additionally, the kit encouraged active participation, collaboration, and enthusiasm in learning. Some challenges included the unpredictability of natural materials and the need for clearer guidance. Overall, the EcoPrint Lab demonstrates strong potential as a sustainable teaching tool that promotes creativity, engagement, and environmental responsibility in art education.

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