



SUSTAINABILITY CULTURE IN PRINTMAKING: PRODUCTION, EDUCATION AND PUBLIC IMPACT

BASKI SANATLARINDA SÜRDÜRÜLEBİLİRLİK KÜLTÜRÜ: ÜRETİM, EĞİTİM VE KAMUSAL ETKİ

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Abstract

This study aims to examine the culture of sustainability in printmaking through a holistic approach encompassing production practices, art education, and social impact. The research is grounded in the assumption that sustainability should not be limited to the use of environmentally friendly materials but rather be considered as a transformative cultural structure that includes pedagogical, institutional, and public dimensions. The study is structured within a qualitative research framework and conducted through literature review, document analysis, and the examination of practice-based printmaking production processes. Within this scope, the effects of non-toxic inks, recyclable surfaces, and low-energy printmaking techniques on artistic production and educational environments were evaluated. The findings indicate that sustainable printmaking practices go beyond reducing environmental impact, transforming artists' production habits and strengthening critical awareness in art education processes. It has been determined that educational programs and studio practices play a decisive role in integrating sustainability awareness into artistic practices. Furthermore, environmentally themed printmaking exhibitions and public art projects demonstrate significant potential to foster ecological awareness and a sense of social responsibility among audiences. In conclusion, the study reveals that sustainability in printmaking is not merely a technical preference, but a field of cultural transformation encompassing production, education, and public engagement. It emphasizes the necessity of disseminating this approach through art education curricula and institutional policies.

Keywords: Ecological Art Practices, Environmentally Friendly Materials, Art Education and Sustainability, Public Awareness, Transformative Learning.

Öz

Bu çalışma, baskı sanatlarında sürdürülebilirlik kültürünü; üretim pratikleri, sanat eğitimi ve toplumsal etki ekseninde bütüncül bir yaklaşımla incelemeyi amaçlamaktadır. Araştırma, sürdürülebilirliğin yalnızca çevre dostu malzeme kullanımıyla sınırlı olmayan; pedagojik, kurumsal ve kamusal boyutları içeren dönüştürücü bir kültürel yapı olarak ele alınması gerektiği varsayımına dayanmaktadır. Çalışma, nitel araştırma yaklaşımı çerçevesinde yapılandırılmış olup, literatür taraması, belge incelemesi ve uygulamaya dayalı baskıresim üretim süreçlerinin analizi yoluyla yürütülmüştür. Bu kapsamda, toksik olmayan mürekkepler, geri dönüştürülebilir yüzeyler ve düşük enerji tüketimine dayalı baskı tekniklerinin sanatsal üretim ve eğitim ortamlarına etkileri değerlendirilmiştir. Elde edilen bulgular, sürdürülebilir baskıresim uygulamalarının çevresel yükü azaltmanın ötesinde, sanatçıların üretim alışkanlıklarını dönüştürdüğünü ve sanat eğitimi süreçlerinde eleştirel farkındalığı güçlendirdiğini göstermektedir. Eğitim programları ve atölye uygulamalarının, sürdürülebilirlik bilincinin sanatsal pratiklere entegrasyonunda belirleyici bir rol oynadığı saptanmıştır. Ayrıca çevre temalı baskıresim sergileri ve kamusal sanat projelerinin, izleyiciler üzerinde ekolojik farkındalık ve toplumsal sorumluluk bilinci oluşturma potansiyeline sahip olduğu görülmüştür. Sonuç olarak çalışma, baskı sanatlarında sürdürülebilirliğin teknik bir tercih değil; üretim, eğitim ve kamusal etkileşimi kapsayan kültürel bir dönüşüm alanı olduğunu ortaya koymakta ve bu yaklaşımın sanat eğitimi müfredatları ile kurumsal politikalar aracılığıyla yaygınlaştırılması gerektiğini vurgulamaktadır.

Anahtar Kelimeler: Ekolojik Sanat Pratikleri, Çevre Dostu Malzemeler, Sanat Eğitimi ve Sürdürülebilirlik, Kamusal Farkındalık, Dönüştürücü Öğrenme.



INTRODUCTION

Although the concept of sustainability is today mostly addressed within the context of contemporary environmental policies and the climate crisis, its origins can be traced back to a historical tradition of thought that considers economic, ecological, and cultural continuity together, extending to the early modern period. One of the earliest written examples of this approach—summarized as “maintaining existence into the future”—can be found in Arthur Young’s work *General View of Agriculture of Hertfordshire*, first published in 1804 (1971). By emphasizing the interdependence between economic development and natural resources, Young presented an early formulation of sustainability thinking. This line of thought was later expanded through Pigou’s approaches to welfare economics and externalities, making critiques of the assumption of unlimited natural resources more visible within economic theory (2018).

In the 1950s, the concept of “maximum sustainable yield,” developed by Gordon, Scott, and Schaefer, transformed sustainability from an abstract principle into an applied governance model (1954 ; 1957). Subsequently, ecological destruction caused by development-oriented ideologies and the rise of environmental movements repositioned sustainability not only as an economic issue but also as an ethical and political one. Rachel Carson’s *Silent Spring* marked a turning point in environmental awareness by revealing the destructive impacts of modern industrialization on nature (1962). Similarly, the *Limits to Growth* report by the Club of Rome demonstrated, through scientific data, the contradiction between the idea of limitless growth and ecological boundaries (Meadows et al., 1972). These developments laid the groundwork for international environmental regimes, from the Stockholm Conference to the Paris Climate Agreement and the United Nations Sustainable Development Goals (United Nations, 2015).

This historical background has necessitated a reconsideration of the relationship with nature, particularly in the field of printmaking. Throughout history, art has generated environmental impacts through its materials, techniques, and modes of production. Printmaking has been one of the disciplines where these impacts are most strongly felt due to its reproducibility, chemical processes, and workshop-based production model. Across the tradition of printmaking—from woodcut to engraving, from lithography to serigraphy—acids, solvents, and toxic inks have long been used as primary production tools, posing serious risks to both human health and ecosystems.

At this point, Walter Benjamin’s theoretical framework on the technical reproducibility of the artwork provides an important foundation for thinking about the relationship between printmaking and sustainability. While Benjamin argued that reproducibility transforms the “aura” of the artwork, he also pointed to its potential to move art beyond elitist contexts into the public sphere (1936; 2008). In this sense, printmaking carries a dual character: it functions both as a democratizing force and, due to its reliance on serial production, as a practice that must be critically examined from an environmental perspective. Contemporary sustainable printmaking practices bring this contradiction into focus by renegotiating the logic of reproduction through ecological responsibility and ethical production principles.

Another important perspective that deepens sustainability debates in contemporary art theory can be found in Suzi Gablik’s critiques of modernist autonomy. Gablik argues that art should be reconsidered not merely as a domain of individual expression and aesthetic innovation, but as a relational, ethical, and ecological practice connected to social contexts (1991; 1995). From this perspective, sustainable printmaking can be understood not only as a matter of material and technical choices, but also as a cultural field involving the reconfiguration of the artist’s relationship with nature, community, and production processes.

Similarly, Grant Kester’s work on dialogical and community-based art practices frames the relationship between sustainability and art within a public and pedagogical context. According to Kester, art should move beyond a one-directional representational relationship with the viewer and instead create a participatory, process-oriented, and ethically responsible field of interaction (2004; 2011). The workshop-based, shareable, and publicly interactive nature of printmaking provides fertile ground for

such dialogical and sustainable practices. Through environmentally themed printmaking projects, workshops, and public exhibitions, art becomes not only a medium for representing environmental issues but also a learning space that fosters social awareness and collective action.

In the context of higher education, it is emphasized that sustainability education strengthens human capital and increases the number of individuals who act toward sustainable living through the interdisciplinary integration of the Sustainable Development Goals into curricula (Filho et al., 2019). However, the understanding of sustainability as a “cross-cutting principle” across disciplines complicates the development of holistic and systematic curricula, particularly in practice-based fields (Vélez et al., 2024). This situation necessitates addressing sustainability in printmaking not only in terms of workshop infrastructure and material choices but also through pedagogical structures, assessment processes, and learning design.

On the other hand, findings indicating that digital technologies support environmental awareness and sustainability-oriented educational initiatives make it necessary to consider sustainability culture in printmaking alongside digital transformation (Wang et al., 2023). Participatory, inclusive, interdisciplinary, and experiential pedagogies—along with approaches that treat the environment and community as learning resources and integrate technology—directly intersect with the workshop-based and publicly engaged nature of printmaking (Rahman et al., 2021).

This historical and theoretical framework demonstrates that sustainability culture in printmaking is not a temporary trend, but a multilayered field shaped simultaneously by art history, critical art theory, educational policies, and social transformation. However, how this field is conceptualized and materialized in contemporary printmaking practices requires a systematic examination of the existing literature. Accordingly, the next section of this study analyzes discussions of sustainability in the context of art and art education considering national and international literature.

This study aims to contribute originally to literature by addressing sustainability in printmaking not as a technical preference limited to environmentally friendly materials, but as a holistic cultural practice that transforms production ethics, pedagogical structures, and public circulation together. Within this framework, the research is structured around the following questions:

- (1) How do sustainable materials and techniques transform aesthetic and technical competence in printmaking processes?
- (2) How do sustainable printmaking practices shape production culture and pedagogical approaches within the contexts of art education and public circulation?

The study seeks to answer these questions through findings derived from artistic production processes within the framework of practice-based art research and aims to contribute to the literature by conceptualizing sustainable printmaking as a holistic model encompassing production, education, and public impact.

LITERATURE REVIEW

This section addresses the historical and theoretical foundations of sustainability, its reflections in art and printmaking, and the pedagogical and institutional discussions within education in a holistic framework. The literature reveals that sustainability is not merely a technical environmental policy, but a multilayered structure associated with cultural, pedagogical, and social transformation.

Historical and Theoretical Foundations of Sustainability

The idea of sustainability was initially addressed in early economic texts in relation to the continuity of natural resources and intergenerational responsibility. Arthur Young’s studies on agricultural economics made visible the relationship between economic development and environmental limits (1971), while Pigou’s welfare economics approach strengthened the economic foundations of sustainability through the concept of environmental externalities (2018). In the mid-20th century, the concept of “maximum sustainable yield,” developed by Gordon and Schaefer, transformed sustainability into an applicable



resource management model (1954; 1957). This theoretical foundation gained ecological, ethical, and political dimensions from the 1960s onward, when environmental crises became increasingly visible (Carson, 1962; Meadows et al., 1972).

Sustainability and Ecological Transformation in Art Theory

Discussions of sustainability in the field of art developed alongside critiques of modernist autonomy. Walter Benjamin's approach to the technical reproducibility of the artwork highlights the cultural and political implications of reproduction and circulation, pointing to the democratizing potential of printmaking (1936; 2008). However, this logic of reproduction has been critically reassessed in contemporary contexts in terms of material use, energy consumption, and waste production. Suzi Gablik opposes the reduction of art to aesthetic autonomy and repositions it as an ethical, ecological, and community-based "restorative practice" (1991; 1995). This perspective shifts sustainable art practices beyond individual production, placing relationships with nature and society at the center.

Sustainability Approaches in Printmaking

Printmaking is considered one of the art fields where environmental impacts are particularly evident due to its reproducibility and its historical reliance on chemically intensive processes. Acids, solvents, and toxic inks commonly used in traditional printmaking techniques pose various risks to both human health and ecosystems, placing printmaking at the center of sustainability debates (Filho et al., 2019).

Recent studies demonstrate that the use of water-based inks, non-toxic or low-toxicity cleaning agents, recycled printing surfaces, and low-energy production methods has led to a meaningful transformation in printmaking practices (Rahman et al., 2021; Wang et al., 2023). These approaches reposition printmaking not merely as a field limited to technical solutions aimed at reducing environmental impact, but as a cultural practice that must be reconsidered within the framework of production ethics and responsible artistic practice.

When evaluated alongside Walter Benjamin's theory of technical reproducibility, this transformation suggests that reproducibility can be associated not only with public circulation but also with ethical responsibility. Benjamin's emphasis on accessibility in the public sphere, when reconsidered from a sustainability perspective, enables printmaking to be rethought as both a public and ethical field of production (1936; 2008). Field studies focusing on printmaking also indicate the increasing prominence of practices such as avoiding toxic materials in workshop processes, using recycled papers, and adopting production models with low environmental impact (Mamur & Tosun, 2025; Metin et al., 2024). Additionally, alternative printmaking techniques such as collagraphy expand this transformation at both technical and conceptual levels by discussing the relationship between sustainability and printmaking through material use and aesthetic considerations (Dartar, 2025).

Dialogical and Community-Based Art Practices

Grant Kester's theory of dialogical art shifts the sustainability-art relationship from a representation-centered understanding to a process- and interaction-oriented structure. According to Kester, art should not establish a one-directional aesthetic relationship with the viewer but rather create a participatory dialogue space grounded in ethical responsibility (2004; 2011). Printmaking workshops, collective production processes, and public exhibitions provide a suitable ground for such dialogical and sustainable practices. The literature indicates that environmentally themed printmaking projects support social awareness and collective learning processes.

Educational Dimension: Curriculum, Pedagogy, Digitalization, and Assessment

Sustainable Development Goals in the Curriculum and Conceptual Alignment

It is emphasized that the expansion of sustainability education in universities can be strengthened through the interdisciplinary integration of the United Nations Sustainable Development Goals into curricula (Filho et al., 2019). However, differing interpretations of sustainability within the academic community complicate systematic curriculum design and may lead to inconsistencies in practice (Vélez et al., 2024). In this context, the literature suggests that sustainability culture in printmaking education should be supported not only through content additions, but also through a curriculum governance model



built on shared conceptual definitions, criteria, and objectives (Filho et al., 2019; Vélez et al., 2024).

Sustainability Pedagogies and Public Learning

Sustainability-oriented pedagogies emphasize participatory and inclusive processes, interdisciplinary approaches, collaborative and experiential learning, and the use of environment and community as learning resources (Rahman et al., 2021). This approach supports an educational design that aligns with the workshop-based nature of printmaking and extends “learning by doing” into a social context (Rahman et al., 2021). However, the literature on critical public pedagogies highlights that such learning relationships with communities must be carefully addressed in terms of research ethics, representational responsibility, and power dynamics (Burdick & Sandlin, 2010).

Digitalization and Assessment

Findings that digital technologies support environmental awareness and sustainability-oriented educational initiatives make it possible to consider analog and digital production practices together in printmaking (Wang et al., 2023). The literature suggests that assessment processes in sustainability education should not be solely product-oriented, but also process-based, reflective, and aligned with learning outcomes. This approach requires that, in printmaking education, not only technical competence but also environmental awareness, ethical sensitivity, and critical thinking skills be included in evaluation criteria.

General Evaluation of Literature

The existing literature demonstrates that sustainability, in the context of art and printmaking, is not merely a technical issue but a multilayered field of transformation encompassing ethical, pedagogical, and social dimensions. However, studies that address production processes, educational practices, and public impact in printmaking in an integrated manner remain limited. This situation necessitates supporting sustainable printmaking practices through practice-based research and expanding the theoretical framework accordingly.

METHODOLOGY

Research Design

This study is structured within the framework of practice-based (practice-led) art research. In this approach, artistic production is not treated as the object of research but as the primary method through which knowledge is generated (Sullivan, 2010). The research process was conducted through the researcher’s studio-based artistic practice, and no methods requiring data collection from human participants—such as experiments, surveys, interviews, or participant observation—were employed. In this respect, the study constitutes a qualitative research design grounded in personal artistic production processes, studio practices, and production-based analyses. The research aims to analyze the production, educational, and conceptual dimensions of sustainable printmaking practices.

Implementation Process and Artistic Practice

The implementation process was carried out through experimental production studies focusing on sustainable printmaking approaches. Traditional printmaking processes were re-evaluated in terms of environmental impact, studio safety, and waste management. Accordingly, water-based inks, non-toxic or low-toxicity cleaning agents, recycled or reusable printing surfaces, and production steps based on low energy consumption were preferred. Artistic production was considered as a reflective field of inquiry in which the material, procedural, and ethical dimensions of sustainability are critically examined.

Data Sources

The data sources of the study consist of artistic production processes and the documentation accompanying these processes, in line with the nature of practice-based art research. Accordingly, the data sources include:

- Document analysis: National and international academic publications on sustainability, art, and printmaking; discussions on sustainability curricula in higher education; exhibition texts and policy documents.
- Artistic production process records: Sketches, trial prints, process photographs, material lists, studio workflow diagrams, and completed works.
- Reflective process notes: Observational and evaluative notes related to decision-making processes, material experiments, and issues such as waste, cleaning, and energy use.

Data Analysis

The data obtained in this study were analyzed through descriptive analysis and qualitative content analysis approaches, in accordance with the nature of practice-based art research. The analysis process includes the systematic examination of process records derived from artistic production practices, visual documentation, and reflective notes.

Within the scope of descriptive analysis, the effects of materials and techniques used in sustainable printmaking practices on the production process were defined through stages such as studio workflow, cleaning and waste management, and energy use. Qualitative content analysis was employed to identify recurring themes and patterns emerging from these processes.

During the analysis, a reciprocal relationship was established between artistic production and the theoretical framework, and the findings were interpreted within the contexts of sustainability, ecological art practices, production ethics, and transformative learning (Sullivan, 2010). In this regard, the aim of the data analysis is not to produce generalizable results, but to develop process-based and transferable conceptual insights.

Ethical Framework and Ethical Approval Requirement

Since the research does not involve data collection from human participants, it does not fall within the scope of studies requiring ethical approval. Nevertheless, the study was conducted in accordance with principles of academic integrity, proper citation, studio safety, and environmental responsibility.

Alignment of the Method with the Research Aim

The selected method enables the examination of sustainable printmaking culture through production and educational practices, directly via artistic application. The practice-based research approach forms the methodological foundation of the study by demonstrating that sustainability is not merely a theoretical concept, but a phenomenon experienced and transformed within artistic production processes.

The research questions identified do not require quantitative measurement or comparative statistical analysis; rather, they relate to phenomena experienced, observed, and reflectively analyzed within artistic production processes. Therefore, the study is structured within the framework of practice-based art research.

The first research question focuses on the aesthetic and technical adequacy of sustainable materials and techniques, and is analyzed through trial prints, process records, and reflective notes. The second research question addresses the educational and public dimensions of sustainable printmaking practices; this dimension is evaluated through descriptive and content analysis based on studio processes, production decisions, and artistic outputs. In this context, the method aims not to produce generalizable results, but to propose a process-based, transferable, and conceptual model.

FINDINGS

The findings presented in this section are derived from artistic productions and process records generated within the framework of practice-based art research. They are discussed in relation to transformations in material and technical choices in printmaking practice, educational and studio-based applications, and the public and social reflections of artistic production. The results indicate that sustainable printmaking practices are not limited to environmental concerns but offer a holistic functionality encompassing artistic production, pedagogical structures, and cultural interaction.

Applicability of Environmentally Friendly Materials and Techniques

The findings demonstrate that environmentally friendly materials and techniques in printmaking are applicable, safe, and aesthetically adequate. Process records and experimental productions show that water-based inks pose lower risks to both the environment and human health compared to toxic solvents. Reduced dependence on solvents during cleaning stages contributes to a more sustainable production workflow in terms of material storage, ventilation requirements, and waste management. The visual and aesthetic outcomes achieved in the prints are comparable to those obtained through traditional processes, while experiments with different surfaces and papers have opened new possibilities for tone, texture, and permeability. This aligns studies in the literature emphasizing the role of water-based inks in supporting environmental awareness, particularly in educational settings (Filho et al., 2019).

Similarly, non-toxic or low-toxicity etching systems such as copper sulfate have been identified as effective alternatives to harmful chemicals like nitric acid. The adoption of such materials reduces reliance on hazardous substances and makes production more manageable in terms of process control and studio safety. The comparability of artistic results challenges the widespread assumption that sustainable printmaking compromises artistic quality; on the contrary, it suggests that such practices may offer new aesthetic possibilities. These findings, along with their justifications, observed outcomes, and limitations, are systematically summarized in Table 1.

Table 1. Material/Technique Alternatives in Sustainable Printmaking: Rationale, Observed Outcomes, and Limitations

Material / Process Alternative	Rationale (Health – Waste – Energy)	Observed Outcomes (Production Process & Records)	Limitations / Considerations
Water-based inks (alternative to oil/solvent-based inks)	Health: reduced exposure to VOCs and solvents Waste: reduced hazardous waste	Significant reduction in solvent use during cleaning; decreased odor and ventilation needs. Comparable aesthetic results (tone, texture, saturation) across different papers and surfaces.	Drying time and layer behavior may vary depending on the surface; contrast and sharpness adjustments may be needed on highly absorbent papers.
Vegetable oil-based cleaners (alternative to thinners/solvents)	Health: reduced skin and respiratory irritation Waste: reduced hazardous waste load	Safer and more controlled cleaning of plates and equipment; improved sustainability of studio workflow.	May require a second cleaning step; final rinsing and drying are necessary to avoid oily residue.
Copper sulfate (low/non-toxic etching systems) (alternative to nitric acid)	Health: reduced corrosive risks Waste: safer waste management	More controllable etching process; simplified safety procedures. Comparable line and tonal values to traditional methods.	Etching speed and surface response may vary; additional calibration and test prints may be required.
Woodcut and woodblock printing (alternative to industrial/chemical plates)	Health: eliminates chemical/solvent use Waste: local and renewable material use Energy: low-energy manual production	Manual carving offers controlled and safe production; natural wood grain provides linear and textural diversity. Durable for multiple prints and long-term use.	Variations in grain direction and hardness depending on wood type; regular maintenance required; sustainable sourcing (local/reclaimed) should be considered.
Tetrapak printing (recycled packaging plate)	Waste: reuse of single-use packaging Energy: reduced indirect material footprint	Produces intaglio-like effects; offers linear and textural diversity; low-cost and accessible for experimental work.	Limited durability; surface degradation in high editions; limited archival permanence.
Recycled paper and reclaimed print surfaces	Waste: reduced resource consumption Energy: reduced indirect energy use	Increased surface diversity: fiber texture in some recycled papers provides aesthetic advantages.	High variability between papers (absorbency, durability, acidity); additional verification required for long-term archival use.
Process planning to reduce proof numbers	Waste: reduced paper and ink consumption Energy: fewer printing/drying cycles	More controlled and targeted production workflow; systematic waste management.	May limit exploration in experimental/multi-layered work; potential aesthetic risks.
Low-energy drying and time optimization	Energy: reduced electricity consumption	Spreading drying over time reduces energy load; improves studio discipline and planning.	Requires careful time management; humidity and temperature may affect drying quality.
Water-based cleaning station & waste separation system	Waste: separation of hazardous and recyclable waste Health: reduced exposure risk	Clear separation of “clean-dirty” zones; improved traceability and transparency in waste management.	Requires institutional infrastructure, proper containers, and regular monitoring; otherwise, unsustainable.
Digital pre-design & proof simulation (digital-analog integration)	Waste/Energy: reduced need for physical proofs	Early clarification of composition and scale; errors detected before printing; supports decision-making.	Screen-print differences (color, tone, texture) may mislead; cannot fully replace material-based experimentation.
Hybrid digital + traditional print processes	Waste: limited editions and targeted production Energy: reduced need for reprinting	Digital tools provide control in draft and limited-edition production; hybrid processes increase flexibility.	Archival permanence and material compatibility of digital outputs must be evaluated.



Educational Dimension: The Relationship Between Learning, Production and Awareness in a Sustainable Printmaking Studio

Although no data were collected from human participants, the restructuring of courses and workshop practices in line with sustainability principles provides significant pedagogical insights into how a sustainability culture is produced and transmitted in printmaking education. Process notes and practice-based production records indicate that sustainability can be integrated not as a separate theme or theoretical content, but as an intrinsic learning domain embedded within material, process, and production decisions.

In this context, education in a sustainable printmaking studio is not limited to the transmission of technical skills. Instead, every stage—such as the type of ink used, plate material, printing surface selection, cleaning protocols, waste separation methods, and energy use—is treated as part of the learning process. The use of water-based inks, the limitation of solvent use, and the adoption of plant-based cleaning solutions enable students to evaluate the production process not only in terms of aesthetic outcomes but also in relation to studio safety, health, and environmental impact.

Likewise, the use of materials such as wood and Tetrapak as printing plates creates a learning environment that deepens material literacy. The use of local or reclaimed wood, the adoption of manual carving techniques, and the application of Tetrapak packaging in acid-free intaglio processes encourage students to consider production in terms of resource use, durability, edition limits, and material lifespan. This fosters the internalization of sustainability not merely as environmental sensitivity, but as an ethical awareness guiding production decisions.

The inclusion of printing surface choices in the educational process also constitutes a key component of sustainability culture. The use of recycled and waste papers in trial and experimental prints, the association of plant-fiber papers with ecological themes, and the conscious evaluation of alternative surfaces allow students to critically examine printmaking practice through concepts such as archival permanence, variability, and surface behavior. This approach supports the understanding of production as a process-based and critical learning domain rather than a purely outcome-oriented one.

Studio organization and workflow are also integral to this pedagogical framework. Planning the number of proofs, scheduling printing sessions and drying times, and prioritizing natural lighting and low-energy solutions make the production process more conscious in temporal and spatial terms. Although this may occasionally conflict with expectations of rapid and intensive production, it introduces principles of slowing down, planning, and awareness that are essential to a sustainable studio culture.

The public dimension of sustainable printmaking education is strengthened through making this production awareness visible via exhibition texts, reproducible print outputs, and open presentations. Transparently sharing materials, processes, and methods positions sustainability not merely as a technical approach but as a learning practice that generates artistic responsibility and public awareness. Within this framework, sustainability in printmaking education is understood not as independent of technical competence but as a holistic learning approach that simultaneously transforms production processes, pedagogical design, and public interaction.

Artistic Production and Public Impact: The Visibility of Ecological Discourse

The recycling-themed printmaking works produced within this research provide important insights into how sustainability can be made visible in the public sphere through artistic production. These works extend beyond representational narratives of the human–environment relationship and function as tools that circulate sustainability discourse through the reproducible nature of printmaking. In this sense, sustainability is reflected in artistic outputs not only as a theme but as an approach embedded in the production process itself.

In the exhibition context, texts accompanying the printmaking works and explanations of production processes make materials, technical choices, and production conditions visible. This narrative—constructed through material disclosure, process transparency, and production decisions—

communicates sustainability to the viewer not merely as aesthetic content but as an ethical and methodological stance. This enhances the public presentation capacity of printmaking and allows sustainability discourse to be reproduced across different contexts.

The reproducible nature of printmaking enables environmentally oriented artistic content to circulate beyond a single exhibition space and reach broader audiences. These characteristic positions are printmaking not only as a representational art form but also as a public practice that generates awareness and fosters sharing. The preference for environmentally friendly materials and techniques demonstrates that this approach is not a technical obligation, but a responsibility grounded in production ethics.

In this regard, sustainable printmaking aligns with approaches that conceptualize art as a restorative, relational, and socially engaged practice (Gablik, 1991; 1995), and reveals that ecological sensitivity in the public sphere can be constructed as both an aesthetic and intellectual experience.

General Evaluation of the Findings

The findings indicate that sustainable materials and processes are applicable and functional in printmaking practice, and that these practices foster a process-oriented studio culture that reorganizes production decisions. Water-based inks, non-toxic or low-toxicity processes, recycled surfaces, and planned energy use make the production workflow safer and more manageable without compromising the quality of artistic output.

Within this framework, sustainability evolves from a secondary technical preference into a cultural approach that simultaneously influences production ethics, educational design, and public circulation. Structuring studio and course workflows around these principles' positions sustainability not as an abstract theme but as a set of criteria embedded within the production process.

Ultimately, the findings demonstrate that sustainable printmaking practices are not merely an environmental necessity, but a holistic practice that strengthens artistic responsibility, pedagogical design, and public engagement. This general evaluation highlights that sustainable printmaking gains meaning not only through what is produced, but also through how it is produced, taught, and circulated. The multilayered structure revealed by these findings underscores that sustainability in printmaking cannot be considered independently of aesthetic outcomes; rather, it constitutes a field of transformation that must be addressed in relation to production ethics, pedagogical design, and public interaction.

Accordingly, the next section will discuss the conceptual contributions of the study by relating the findings to contemporary art theory, sustainability pedagogies, and theoretical discussions on the reproducible nature of printmaking.

DISCUSSION

This discussion section aims to reveal how the findings obtained regarding sustainable printmaking practices relate to the literature on art, printmaking, and sustainability, and what kind of original contributions these findings offer to the field. The discussion is structured around a comparative evaluation of the findings in relation to theoretical approaches, focusing on material and technical applicability, education and pedagogy, artistic production, and public circulation.

Aesthetic and Technical Adequacy of Sustainable Materials

The findings indicate that water-based inks and non-toxic or low-toxicity etching systems such as copper sulfate are not only environmentally and health-conscious alternatives but are also sufficient in terms of artistic quality. This result challenges implicit assumptions that sustainable materials limit artistic production. While the existing literature tends to address environmentally friendly printmaking techniques primarily in terms of studio safety and environmental risk reduction, the issue of aesthetic adequacy is often treated as secondary.

This study expands the literature by demonstrating that sustainable printmaking practices can produce artistic outcomes comparable to traditional techniques. The observed variations in surface behavior,

tonal transitions, and textural possibilities suggest that sustainability in printmaking should not be seen as a “technical compromise,” but rather as a creative strategy that supports experimental and process-oriented production. In this sense, sustainable materials hold the potential to strengthen the exploratory and research-driven character of contemporary printmaking.

Positioning Sustainability as an Ethical Principle Rather Than a Thematic Concern

One of the most significant contributions of the findings is the demonstration that sustainability in printmaking operates not merely as a represented environmental theme, but as an ethical principle that directly shapes the production process. Decisions regarding ink type, plate materials, proof numbers, cleaning protocols, and waste management embed sustainability within the very structure of artistic production.

When considered alongside Walter Benjamin’s framework of technical reproducibility, this suggests that the reproducible nature of printmaking should be re-evaluated not only in terms of circulation and accessibility but also in relation to ethical responsibility and production awareness (1936; 2008). By situating Benjamin’s concept of reproducibility within an ecological context, this study makes visible a contemporary and critical dimension of production ethics in printmaking.

Pedagogical Transformation Potential in Education and Studio Design

Although no data was collected from human participants, the restructuring of courses and studio practices in accordance with sustainability principles points to a process-based pedagogical transformation in printmaking education. The findings show that sustainability, when integrated into material selection, plate production, surface choice, cleaning, and waste management, becomes a structure that directly shapes the learning process rather than remaining a separate conceptual topic.

This approach enables sustainability to move beyond an abstract field of knowledge and become a form of learning experienced through production. The structuring of the studio environment in this way aligns conceptually with experiential and practice-based learning approaches emphasized in sustainability pedagogy (Rahman et al., 2021). Thus, the printmaking studio becomes a learning space in which environmental responsibility gains meaning alongside technical knowledge.

Artistic Production, Reproducibility, and Public Circulation

The findings provide important insights into how sustainable printmaking production can circulate in the public sphere. Recycling-themed printmaking works not only represent environmental issues visually but also transform sustainability discourse into a shareable production practice through the reproducible nature of printmaking.

The visibility of production conditions through exhibition texts, material disclosures, and process transparency carries sustainability into the public domain not merely as an aesthetic theme, but as a methodological and ethical stance (Kester, 2004). This shifts printmaking from being a passive representational tool to a public practice capable of generating awareness. This approach aligns with perspectives that conceptualize art as a restorative, relational, and socially engaged practice (Gablik, 1991; 1995).

General Outcome of the Discussion

Overall, the discussion demonstrates that sustainable printmaking practices extend beyond environmental benefits to offer a multilayered approach that rethinks artistic production, transforms educational processes, and strengthens public circulation. The findings indicate that sustainability is not a secondary preference in printmaking, but a central principle that redefines production ethics, pedagogical design, and artistic responsibility. In this respect, the study contributes to literature with a practice-based, process-oriented, and conceptually expansive perspective on sustainable printmaking culture.

CONCLUSION

This study demonstrates that sustainable printmaking practices go beyond being environmentally friendly technical choices, offering instead a holistic approach that reconstructs production ethics, transforms pedagogical design in a process-oriented manner, and enhances public circulation. The findings obtained through practice-based art research show that water-based inks, non-toxic or low-toxicity processes, recycled surfaces, and planned energy use can be implemented without compromising aesthetic quality. This confirms that sustainability in printmaking should not be seen as a “*zone of compromise*,” but as a creative strategy that expands experimental possibilities.

Furthermore, sustainability is shown to function not merely as a thematic concern but as an ethical principle embedded within production decisions. Choices related to ink types, plates, surfaces, proof planning, cleaning, and waste management establish sustainability as a foundational criterion guiding the production process from the outset. In this respect, printmaking is reconsidered not only in terms of circulation and accessibility through its reproducible nature, but also in terms of responsible production. In the educational dimension, structuring courses and studio practices according to sustainability principles transform sustainability from an abstract concept into a learning practice experienced through production. The integration of material literacy, studio safety, waste reduction, and energy use into learning design transforms the printmaking studio into a pedagogical space where environmental responsibility and technical skills intersect.

At the public level, the reproducible nature of printmaking enables sustainability discourse to become visible as a shareable and circulating production practice. Through exhibition texts, material disclosures, and process transparency, sustainability is conveyed not only as aesthetic content but also as a methodological and ethical stance. In this way, sustainable printmaking aligns strongly with approaches that conceptualize art as a restorative and relational practice.

Based on the findings, the following recommendations can be proposed to ensure the effective and lasting dissemination of sustainable printmaking culture:

- **Studio Practices:** Water-based inks, non-toxic/low-toxicity processes, and recycled surfaces should be adopted as core components of printmaking production. Cleaning, waste separation, and disposal should be planned as integral parts of the production process.
- **Curriculum and Educational Design:** Sustainability should not be treated as a separate subject but as a principle embedded in material choices, production processes, evaluation criteria, and studio workflows. Learning outcomes should integrate technical competence, process awareness, and environmental responsibility.
- **Studio Culture and Process Management:** Planned proofing, time-regulated energy use, and routine recycling practices should support a conscious, process-based production culture.
- **Public Presentation and Circulation:** Sustainability-oriented works should be disseminated through exhibitions, open studios, and reproducible print outputs. Transparent communication of materials and processes will position sustainability as both an aesthetic and methodological stance.
- **Future Research:** Sustainable printmaking should be further explored through interdisciplinary and process-based research models integrating ecology, education, and digital technologies.
- These recommendations aim to position sustainable printmaking not merely as a technical choice, but as a cultural framework transforming production, education, and public engagement.

The originality of this study lies in conceptualizing sustainability in printmaking not as a secondary environmental concern, but as a holistic framework encompassing an ethical principle embedded in production, a pedagogical approach shaping education, and a strategic tool enabling public circulation. The study addresses sustainable printmaking not only at the level of representation but as a concrete field of practice experienced through material choices, technical decisions, process planning, and production conditions.



Developed through a practice-based research approach, this perspective demonstrates that sustainability does not conflict with aesthetic productivity in printmaking; on the contrary, it enriches artistic research by opening new possibilities in surface, texture, and process. It also shows that integrating sustainability into studio and educational environments in a process-oriented manner fosters an ethical and critical production awareness beyond technical skill acquisition.

In this respect, the study repositions sustainable printmaking within the contexts of artistic production, pedagogy, and public interaction, offering an applicable, expandable, and process-oriented model. By demonstrating that sustainable printmaking culture can serve as a strong reference framework for future artistic, educational, and public practices, the study makes a distinctive and lasting contribution to literature.

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