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Integrating Eco-Social Justice in Design Education: A Case Study on Object-Based Learning in the UK

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This research explores the integration between objects, learning, and eco-social justice (ESJ) within undergraduate and postgraduate Design Management programs at an arts university in London, UK. ESJ is defined here as the interconnected pursuit of ecological sustainability and social equity. Using a case study approach, the empirical research examines how students engage with objects through their senses, curiosity, imagination, and peer-to-peer learning in a higher education classroom setting. The research aims to design and utilise a series of artefacts, 'drinking vessels', to stimulate critical reflection on ecological and social issues through object-based learning (OBL). While OBL is commonly used in museum education, its application in design education, particularly concerning ESJ, remains limited. This research contributes to understanding how three artefact types (found object, natural object and designed object) support student engagement with ESJ concepts. This paper presents findings from Phase 1 of the research, highlighting the role of artefacts in fostering awareness of ecological and social responsibility, and offering insights for future classroom interventions to deepen the integration of ESJ in design education through OBL.

Keywords: *Object-based Learning, Eco-social Justice, Classroom Learning, Design Education*

1 Introduction

This research explores the potential of design education to address eco-social justice (ESJ) by integrating object-based learning (OBL). It explores how artefacts can be designed and utilised to facilitate engagement with ecological and social justice in higher education classroom settings. By focusing on the role of objects in learning environments, this research investigates how OBL can be embedded in design education to support teaching and learning of ESJ.

This paper forms part of an ongoing doctoral research, titled "Design Education for Eco-Social Justice: Developing Tangible Interventions in Learning and Teaching Approaches" (working title). The research is conducted in collaboration with undergraduate and postgraduate Design Management programs at a creative arts university in London, UK. It focuses on the design of artefacts, referred to here as 'drinking vessels'. The choice stems from Phase 0 findings, which indicated students' familiarity with

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drinking vessels as everyday objects and their potential to provoke reflection on materiality, sustainability, and social issues.

By situating artefacts at the intersection of design practice and teaching and learning, this research explores how artefacts can communicate eco-social justice within higher education. While OBL has been widely applied in museum studies, its potential in design education, particularly in teaching eco-social justice, needs deeper theoretical and pedagogical investigation. This research addresses this gap by investigating how artefacts can engage in design-related classrooms, allowing students to critically interact with ecological and social themes through objects.

The main research question guiding the broader doctoral research is: “How can artefacts be designed and embedded in classroom teaching and learning contexts in design education to convey eco-social justice in higher education?”. This paper specifically addresses one of the sub-research questions: “How do different object types (found, natural and designed objects) shape engagement and understanding of eco-social justice in design education?”.

The direct contribution of this research lies in generating insights into object-based learning, particularly regarding how artefacts can be designed and implemented to enhance the teaching and learning of eco-social justice. By integrating design practice into curriculum delivery, this research explores artefact typology and its pedagogical potential.

2 Context

Object-based learning (OBL) is defined as a student-centred pedagogical approach, which encourages active engagement with artefacts through immersive and multisensory experiences (Cain, 2011; Chatterjee & Hannan, 2016). Unlike traditional knowledge acquisition from textbooks, OBL positions objects as the primary medium for teaching and learning, emphasising direct interaction and hands-on exploration as key components. In this research, the term ‘artefacts’ refers to three-dimensional, tangible, handheld objects that can be touched. These extend beyond traditional museum specimens or artworks to include everyday objects and designed objects used in educational contexts.

Eco-social justice (ESJ) is understood as the interconnected relationship between ecological and social justice. Rather than treating these separately, this research approaches them as an interdependent framework. While it does not attempt to address all ESJ’s dimensions, the research focuses on how design classrooms can engage with ESJ through object interaction. Some scholars (Jaffe & Gertler, 2008; Wang & Altanbulag, 2022) identify ESJ as central to sustainable development through the interaction of natural and social systems. Nixon (2011) similarly argues that environmental crises are interwoven with racial inequality, colonial exploitation, and economic injustice. Theoretical perspectives from ecofeminism and posthumanism deepen this understanding. Ecofeminist scholars (Plumwood, 2002) reveal how ecological and social injustices arise from the same hierarchies that privilege humans or certain groups over others. Posthuman theorists like Bennett (2010) and Braidotti (2013) challenge anthropocentric thinking by recognising materials, technologies, and non-human entities in shaping social and ecological relations. These perspectives open a way to consider how engagement with objects mediates eco-social understanding in education.

Within this context, Garber (2004) connects social justice in education with environmentalism and material culture, while Martin et al. (2013) point to the complexity of linking ecological action and

social equity in higher education. In material culture studies, Ingold (2013) demonstrates how learning through direct engagement with materials cultivates an awareness of the making process. Ingold urges attention to sensory dimensions of making, where knowledge emerges through doing. This emphasis on material engagement aligns closely with OBL's commitment to experiential learning and provides a bridge to integrating eco-social justice within higher education classrooms.

The purpose of integrating ESJ-driven design education is to shift the conversation from treating sustainability as a technical or aesthetic concern, to understanding it as an eco-social justice practice. ESJ-driven encourages students to see each design act as part of networks that connect humans and more-than-human. To explore how artefacts facilitate eco-social justice teaching and learning, this research draws on OBL to examine how different types of objects can be catalysts for discussion and engagement with complex eco-social issues.

3 Research method and approach

This research adopts a case study approach as an “empirical inquiry” (Yin, 2014) to explore how object-based learning (OBL) can be integrated into design education to communicate eco-social justice (ESJ) knowledge. The case study enables an exploration of how OBL functions within higher education design programs, particularly in engaging students with ESJ concepts.

The empirical research is conducted in collaboration with the BA (Hons) Design Management (BADM) and MA Design Management (MADM) programs at a creative arts university in London, UK. At this UK-based university, the term ‘program’ can be understood as equivalent to ‘major’ in other institutions. The case study incorporates ‘in-class research sessions’, group interviews, worksheets, and artefacts to examine how different types of OBL artefacts support ESJ learning within design classroom in the UK. The term ‘in-class research sessions’ refers to sessions conducted within the regular classroom environment, where three types of objects are embedded into scheduled Design Management classrooms. These 60-minute sessions are integrated into the curriculum for empirical data collection. Students work in small groups of 3 to 4, fostering collaborative learning through engagement with the artefacts as part of their normal class activity.

This paper specifically focuses on Phase 1 (Spring 2024) of the empirical research, as illustrated in Figure 1.

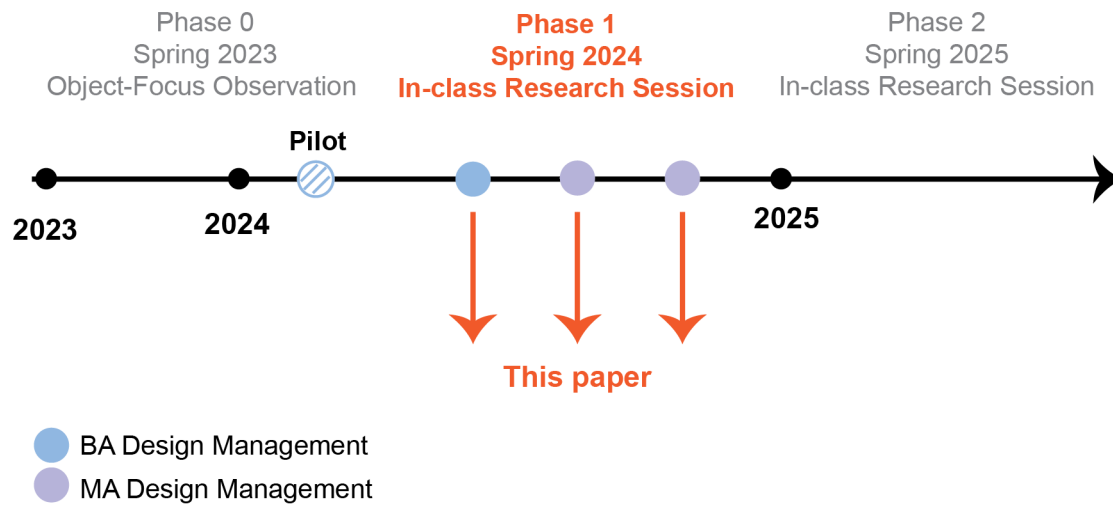


Figure 1. Empirical Research Timeline. This paper focuses on Phase 1, conducted during Spring 2024 through three in-class research sessions: one in BADM and two in MADM. Figure illustrated by the author.

While the broader research spans three academic years (2023–2025), this paper presents data and findings from Phase 1 only, without addressing the full longitudinal research. Phase 1 is one of three research phases and includes one undergraduate (BADM) and two postgraduate (MADM) in-class research sessions. Phase 0, a preparation and pilot stage, precedes Phase 1, while Phase 2, a future implementation phase, follows it, both of which fall beyond the scope of this paper.

3.1 Practice-based research and artefact design

The practice-based research involves the design process of OBL artefacts embedded within Design Management (DM) programs. Following insights from Phase 0, the preparation phase, ‘Drinking Vessels’ were identified as the primary design intervention objects in this research, to enhance engagement of ESJ concepts within higher education classrooms. Building on findings from the pilot session in Phase 0, the research categorises artefacts into three types: Found Objects, Natural Objects, and Designed Objects.

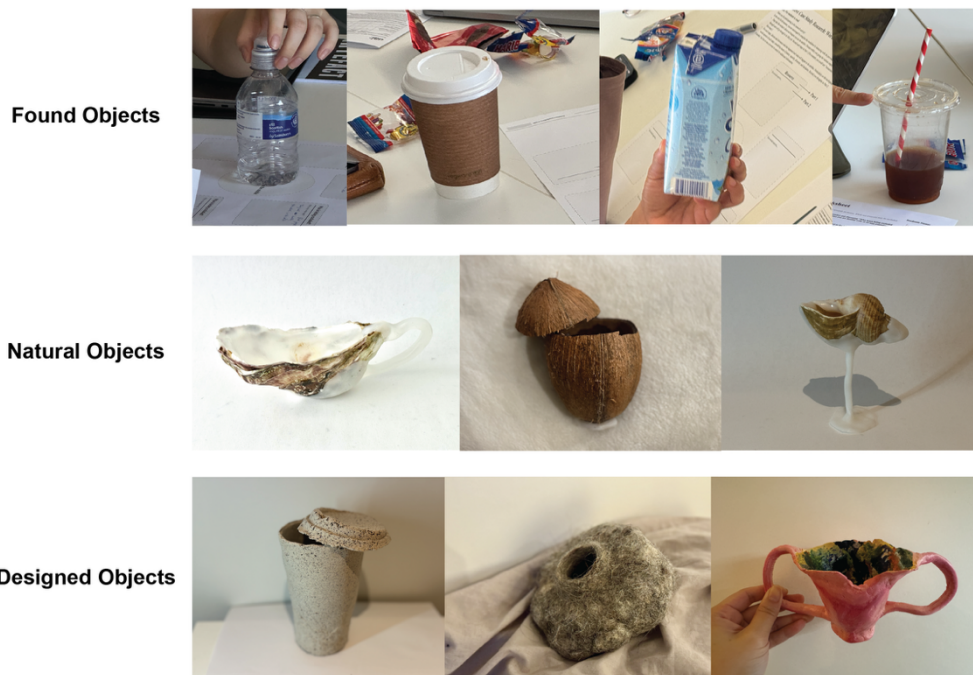


Figure 2 Examples of three types of artefacts, including found, natural, and designed objects. Image by the author.

Figure 2 presents examples of the three types of artefacts utilised in this research. Found Objects are everyday items that students bring to classroom, such as water bottles, coffee cups, or cans. Natural Objects are designed by the author and re-incorporated with natural materials (e.g., shells, seeds or fruit). With the characteristics of natural form and materials, these have been termed ‘natural objects’ to differentiate them from ‘designed objects’. Designed Objects are artefacts intentionally created by the author for OBL to embed eco-social justice themes within the design. Found objects provide a familiar and personal connection for students. While natural and designed objects are created by the author in the role of a designer, they introduce perspectives on materiality, sustainability, and eco-social responsibility.

3.2 Data collection methods

During three in-class research sessions, students directly engage with the artefacts in structured research sessions. The analysis focuses on determining whether eco-social justice concepts embedded in the artefacts are communicated, as reflected in group interviews and worksheets completed in student groups. This research used worksheets designed to encourage reflection and discussion among students during in-class session (see Figure 3). The worksheet is designed to collect qualitative insights through open-ended responses, allowing students to express their thoughts freely (Cohen et al., 2018). Students can respond in writing or through sketches, accommodating different forms of expression.



Figure 3. Students working with worksheet in a group during in-class research sessions in Phase 1. Photo by the author, Spring 2024

Additionally, group interviews are conducted to further explore students' learning experiences related to eco-social justice and object-based learning. In qualitative research, interviews provide insights into participants' thoughts, feelings, and experiences (Kvale, 2007). This research adopts a semi-structured interview format (Flick, 2009), where the interviewer guides the discussion with open-ended questions, allowing participants to share their experiences, reflections, and suggestions.

4 Data analysis and findings

To conduct a deeper analysis of Phase 1, the research focused on the group interview transcripts and handwritten worksheets. Drawing from the literature and student responses, a list of key thematic ideas (Gibbs, 2007) is developed and informed by theoretical and prior research. Initially, I categorised the data into three categories:

- Category 1: Object - material, shape, surface, function
- Category 2: Learning - senses, curiosity, imagination, peer-to-peer learning
- Category 3: Eco-Social Justice - including recycling, biodegradability, reuse, non-human, environment, waste, gender, disability, transportation, and life cycle

This categorisation helped identify intersections between objects, learning, and ESJ, and informed the development of a cross-analysis framework. Figure 4 presents a visual framework of this analysis.

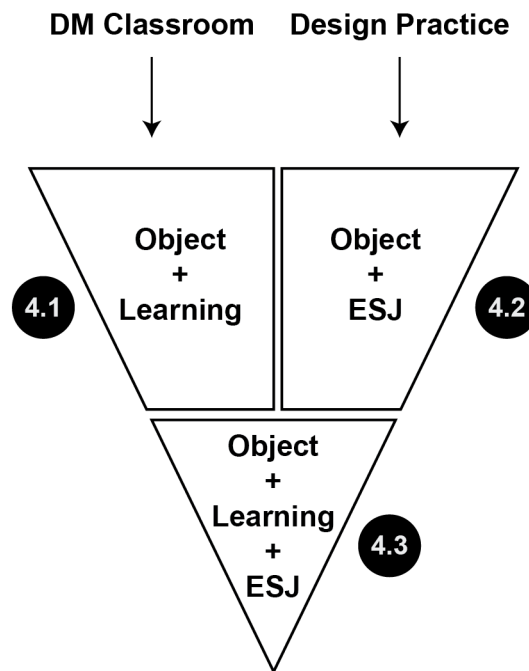


Figure 4. Visual Framework of Cross-Analysis. Numbers in the diagram correspond to the sub-sections. Diagram by the author.

The inverted pyramid-like framework (Figure 4) investigates these intersections in three ways, as explained in the following sub-sections:

- Sub-section 4.1: Object + Learning, examining how objects support learning in the Design Management (DM) classroom.
- Sub-section 4.2: Object + ESJ, exploring how objects communicate ESJ knowledge in design practice.
- Sub-section 4.3: Object + Learning + ESJ, synthesizing how these elements interact holistically.

4.1 Cross-analysing: Object + Learning

To analyse the relationship between objects and learning, I created a table in Excel that spans three sessions. The table organises data with objects (material, shape, surface, function) in the columns and learning (senses, curiosity, imagination, peer-to-peer learning) in the rows. Each cell contains relevant student responses from group interviews and worksheets.

This analysis revealed how object properties influence different learning dimensions. Some artefacts sparked curiosity about materials, while others triggered sensory engagement or prompted imaginative reinterpretations. To better understand these patterns, I manually counted instances and visualised the frequencies in Figure 5.

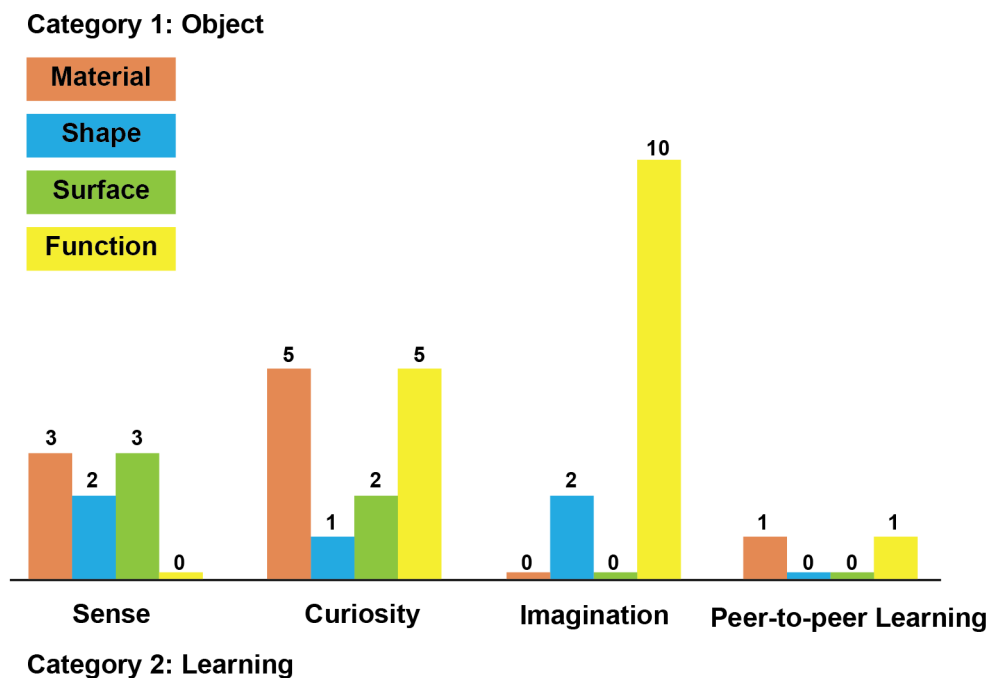


Figure 5. Frequency of mentions in 'Object + Learning' in Phase 1. X-axis: learning categories; Y-axis: object categories. Numbers on the bars indicate frequency of mention. Chart created by the author.

Key insights from object + learning cross-analysis include:

- Sense is primarily linked to material, shape, and surface, with three mentions for 'sense + material', two for 'sense + shape', and three for 'sense + surface'. However, there are no mentions of sense related to function. This suggests that when students engage with objects through their senses, they focus on physical aspects like material, shape, and surface rather than functionality.
- Curiosity is equally connected to material and function, both with five mentions. There are two mentions related to shape and one related to surface. This indicates that students are mainly curious about what objects are made of and how they function, while visual aspects are considered to a lesser extent.
- Imagination is most strongly linked to function, with ten mentions, while two responses connect imagination to shape. No mentions relate imagination to material or surface, suggesting that students are primarily inspired by the intended function of objects when imagining new possibilities.
- Peer-to-peer learning was connected to material and function, with one mention for each. There are no mentions of peer learning related to shape or surface, indicating that discussions among students tend to centre on what objects are made of and their potential uses rather than their shapes or surfaces.

These findings suggest that material and function are the most influential object properties in shaping student learning, particularly through curiosity and imagination. The lack of strong connections

between senses and function highlights a gap in how students interact with objects beyond tactile experiences.

4.2 Cross-analysing: Object + ESJ

While the previous subsection (4.1) focused on how object attributes supported learning, this part shifts focus to how objects relate to eco-social justice themes. I used a second Excel table to conduct a cross-analysis between object attributes and ESJ-related responses.

Unlike subsection 4.1, this subsection does not include a chart, as the data was more textually descriptive and open-ended in nature. Additionally, artefact codes are abbreviated as follows: FO = Found Object, NO = Natural Object, DO = Designed Object, followed by a number identifier.

Key connections between “Object and ESJ” identified include:

- **Material and recycling:** One of the strongest connections that appeared was between material and recycling. Many students questioned the recyclability of materials or expressed concerns about recycling policies. For example, one group stated, “The first thing that came into my mind is whether it is recycled or not (Artefact_FO_06)”. Others asked, “Is the paper recycled? Can it be recyclable? (Artefact_DO_06)” or noted the lack of clear recycling policies, saying, “No particular recycling policy (Artefact_DO_04)”. These responses spanned three types of objects, suggesting that materiality plays a crucial role in students’ understanding of recycling.
- **Material and non-human impact:** Some students recognised that materials often originate from living organisms, raising ethical and environmental concerns. For instance, one group noted, “And also about the raw materials. And we said something about ... the seashell coming from an animal (Artefact_NO_01)”. Another questioned the impact of wool production, asking, “Were sheep sheared and tanned? (Artefact_DO_04)”. Deforestation was also mentioned with material, as indicated by the response, “We lose trees to create paper (Artefact_FO_06)”. These reflections highlight students’ awareness of the broader ecological consequences of material sourcing.
- **Material, surface and transportation:** One group commented on packaging logistics, noting, “Transported flatpack are filled with processed food and beverage (Artefact_FO_04)”. Another response connected transportation efficiency to material choices: “Shipping carbon emissions may be lower due to lightweight material, and it is stackable so compact and less space required per unit distributed (Artefact_DO_01)”. These insights indicate that students recognise the environmental impact of material weight and packaging design on carbon emissions.
- **Shape, surface with accessibility/disability:** One response mentioned difficulties faced by individuals with oral impairments, stating, “Patient with trouble using their lips (Artefact_FO_08)”. Other responses highlighted challenges for visually impaired individuals, such as “Also for blind people, they can't identify the content in this bottle by touching it (Artefact_FO_08)” and “Visually impaired person, they can't see the colour (Artefact_DO_05)”. Another student noted, “I guess visual impairments like the way you see and interact with this object would differ based on your abilities or disabilities

(Artefact_DO_06)". These responses emphasise the importance of inclusive design, particularly regarding shape and tactile accessibility features.

These findings demonstrate that students naturally engage with eco-social themes when interacting with objects. Material emerged as a key factor for discussing recycling, non-human impact, and transportation. Shape and surface, meanwhile, were associated with inclusivity and accessibility, underscoring the need for inclusive design practices in educational contexts.

4.3 Cross-analysing: Object + Learning + ESJ

After examining the relationships between 'Objects and Learning' (4.1), and between 'Objects and ESJ' (4.2), this subsection integrates both strands to explore how objects support learning in ESJ. This combined analysis focuses on identifying moments where material properties, learning processes, and ESJ themes intersect.

To document these connections, I reviewed all student responses from Phase 1 and grouped them iteratively based on recurring themes. The analysis revealed several recurring combinations, suggesting that students often engage with ESJ-related topics through their learning encounters with object attributes. These intersections are outlined below.

- **Material, curiosity, and recycling:** This combination appeared frequently, suggesting that students who were curious about what an object was made of often questioned its recyclability or environmental implications. For example, one group explored the origins of glue, questioning its composition and safety: "We use Google for researching the glue. We're trying to understand what glue was made from, because in the past, in some areas, it was made from fossils. We wanted to see whether this glue is food-safe, and now glue is made from recycled pharmaceuticals, gelatin, that is something new we learned (Artefact_DO_05)". Similarly, another student expressed concern over the materials used in an object, linking it to recycling and potential environmental harm: "Seems to be painted in acrylic paint, may be harmful to the environment. Is the paper recycled? Can it be recyclable? (Artefact_DO_06)". These examples highlight how curiosity about materials often leads students to consider their environmental impact.
- **Shape, imagination, life cycle:** Several students used imagination to consider an object's journey over time. One response reflects on how an object's journey can be visualised: "I think it (the artefact) is good for imagining. Like, you're trying to picture its whole journey on different levels (Artefact_DO_05)". Another response presents a role-playing perspective, where the student narrates the journey of an object: "1) I was born on a tree 2) I got handpicked 3) I got shipped to grocery store and someone bought me. 4) I was be-headed and left to dry out on sun (Artefact_NO_05)". These findings indicate that students actively use imagination to understand the lifecycle of objects.
- **Material, curiosity, life cycle:** In some responses, initial curiosity about an object's material evolved into reflections on production processes and human involvement. One student reflected on the journey of an object, considering not just its creation but also the people involved in its making: "So we were just kept on wondering what the purpose of this is. And like, why was it made? And then, obviously, how was it made? And then even the people who

were involved in the making, so I think all over it covered like a very good 360-degree angle from the beginning to end (Artefact_DO_05)". This highlights how an initial curiosity about material can evolve into an object's life span and production process.

- Material, peer-to-peer learning, and life cycle: In some cases, students deepened their understanding of ESJ themes through collaboration. One student explicitly credited their peers for broadening their perspective: "I think I learned a lot from both of them (finger pointing to her two peers). Because they thought of a lot of aspects that were put into making this paper and this shape. From the materials, labour and then the function, and how would it impact the users as well (Artefact_DO_05)". This response underscores the role of peer-to-peer learning in developing an understanding of objects.

Overall, the frequent appearance of "material + curiosity + recycling" suggests that tactile engagement with materials often initiates deeper discussions around sustainability and justice. These findings support the idea that object-based learning, when intentionally scaffolded, can be a strategy for introducing ESJ themes. Material exploration, combined with curiosity and collaborative discussion, provides a pathway for students to connect everyday design artefacts to broader ecological and social concerns.

5 Discussion and conclusion

This research integrates a case study and empirical data analysis to explore the relationship between objects, learning, and eco-social justice (ESJ). The research analyses how students engage with objects through curiosity, imagination, senses, and peer-to-peer learning, highlighting the potential of object-based learning (OBL) for fostering ESJ awareness.

A key takeaway is the significant role of material and function in shaping student learning. The findings indicate that students engage most deeply with objects when they question their composition and functionality, with curiosity and imagination serving as primary drivers of learning. The connection between material and recycling suggests that OBL can introduce sustainability concepts, particularly when students are encouraged to consider the life cycle and environmental impact of objects.

From an ESJ perspective, this research demonstrates that students naturally engage with social and ecological considerations when analysing objects. The discourse surrounding recycling in student reflections illustrates that materiality plays a critical role in their understanding of waste, resource use, and sustainability. Furthermore, students' discussions on non-human impact highlight a growing awareness of how human consumption and production affect ecosystems. These findings align with the broader goal of integrating eco-social justice into design education, reinforcing the importance of using physical artefacts for critical discussion.

This paper focuses on Phase 1 findings, which will inform the next stage of the research in Phase 2. The upcoming phase will involve developing new artefacts and testing them in Design Management classroom settings. Ultimately, this research contributes to understanding how artefacts can be designed and implemented to improve eco-social justice teaching and learning through object-based learning.

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