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Towards a Fusion: Embedding Object-Based Learning for addressing Eco-Social Justice in Design Education

Lezhi Zhang^a

^aLondon College of Communication, University of the Arts London

*Corresponding author e-mail: c.zhang0320201@arts.ac.uk

Abstract: This paper investigates the potential of object-based learning (OBL) within design discipline in higher education. The author emphasizes the key literature and contributors in the realm of OBL and delineates the methodological framework for future research. The research proposes conducting empirical research in two case studies, one focusing on an undergraduate course and another on a postgraduate course at the creative arts university. The opportunities of object-based learning to integrate into learning and teaching sessions under the context of eco-social justice are discussed. This paper addresses two research questions: "How might we design OBL artefacts to be utilised in learning and teaching sessions?" and "How might we design learning and teaching sessions to embed OBL artefacts?" This paper stems from the larger doctoral research that explores the necessity to evolve climate action and social justice in curriculum design through object-based learning.

Keywords: Object-based Learning, Design Education, Design Intervention, Climate Action, Social Justice

1. Introduction

In today's world, climate action and social justice as interconnected needs are critical issues that require urgent attention. It is well-established that education should focus on the links between the quality of the environment and human social-economic development (Martin et al., 2013).

Greer et al. (2021) conducted an analysis of England's recent climate change education policy landscape, including curriculum, inspection, and teachers' standards documents (in Dunlop & Rushton, 2022). Their findings revealed that policy related to sustainability and climate crisis, education was overlooked in responding to these issues, while Martin et al. (2013) had previously stated that there was a trajectory of diminishing policy in this area.

In responding to issues of ecological and social need, eco-social justice emerges as a focal point for action to produce change (Jones et al., 2012, p.147). Garber (2004) states that concerns for social justice education bring together the perspectives of environmentalism, critical pedagogy, social

reconstructions, as well as contemporary art, visual and material culture. However, Martin et al. (2013) analysis of the current barriers to education for sustainable development in teaching higher education students in the United Kingdom, due to the interconnectedness of climate action and social justice results in complex and multifaceted topics that require a nuanced understanding and an interdisciplinary approach.

To address these challenges, it is essential to embed climate action and social justice into the curriculum design as a key strand. As Greer et al. (2021) advocates for the inclusion of climate change in the curriculum. One way to achieve this is through Object-based Learning (OBL) in a student-centred learning environment (Cain, 2011; Chatterjee et al., 2016), where students actively engage with artefacts to learn about eco-social justice topics (Banning & Gam, 2020).

This doctoral study, from which the paper draws its content, addresses the gap in pedagogical approaches around eco-social justice in higher education. As part of the larger PhD study, it is important to recognize the role of this position paper. The paper aims to delve into a particular aspect (See Figure 1) of the study that explores the relationship between OBL artefacts and learning and teaching design. This paper is planned by answering the following research questions: “How might we design OBL artefact to be utilised in learning and teaching sessions?” and “How might we design learning and teaching sessions to embed OBL artefacts?”

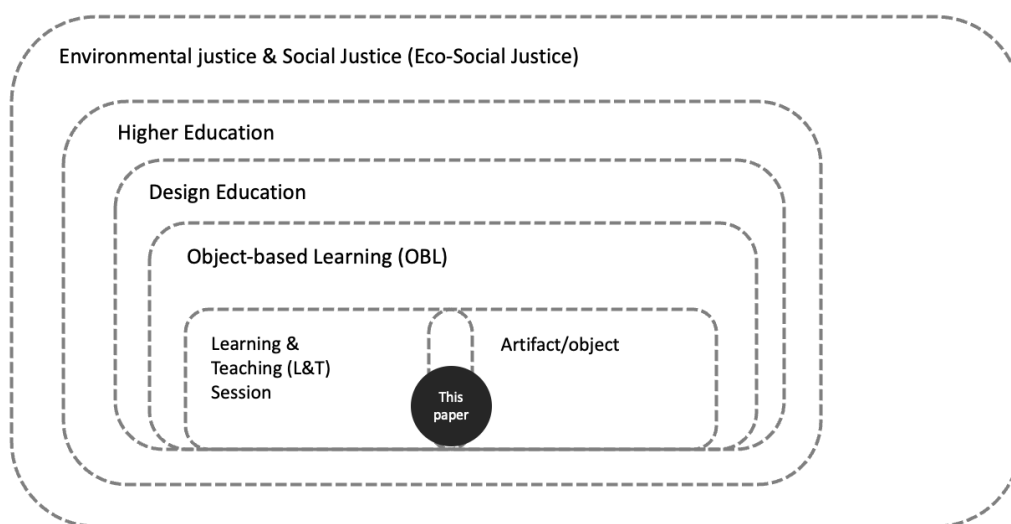


Figure 1. General areas of study and position of this paper

In this paper, the researcher explores the interconnection between OBL artefact and learning and teaching (L&T) sessions and addresses the opportunities that OBL offers to embed eco-social justice in curriculum design. On one hand, the paper analyses the characteristics of OBL artefacts design, such as colour, material, and size, that could be utilised in L&T sessions to engage the educational and multisensory experience. By incorporating OBL artefacts, educators and learners can communicate climate and social justice topics through tangible objects. On the other hand, the study explores how L&T session embeds OBL artefacts to facilitate the development of eco-social justice, including the selection or creation of artefacts, theoretical framework, and assessment process. OBL artefacts provide opportunities for educators to select objects or create tools that convey complex concepts of eco-social justice.

2. Context

2.1 Object-based learning in higher education

Object-based learning (OBL) is a student-centred (Cain, 2011; Chatterjee et al., 2016; Rockenbach, 2011) experiential pedagogy that is concerned with the tactile study of material things (Barlow, 2017). OBL is an approach for “learning about, with, and through objects” (Paris, 2002, p.14), that involves active object interaction experiences into the learning environment (Chatterjee & Hannan, 2016). This mode of education cannot be easily replicated by two-dimensional representations (Miles, 2018) or the traditional lecture-theatre model (Cobley, 2022, p.78), as object handling provides opportunities to engage through interaction (Chatterjee, 2008).

OBL originates from physical artefacts in museums (Chatterjee & Hannan, 2016), it is typically taking place in gallery, library, archive, and museum, known as GLAMs (Cobley, 2022, p.6). Although the use of OBL has been highlighted in museum learning for decades, the material is not limited to the historical archive but also everyday artefacts. OBL can be successfully undertaken with all sorts of objects and materials, including things that could be found at home or in a rubbish bin (Kador et al., 2017, p.3). OBL encourages students to learn through close observations, conceptual thinking (Miles, 2018) and multisensory engagement (Thogersen et al., 2018).

Cobley (2022, p.75) contends that OBL can be effortlessly transferred across various academic disciplines in higher education. This assertion is corroborated by Chatterjee's (2011) study that OBL has been effectively implemented in fields as diverse as zoology, art, archaeology, and non-traditional subjects such as business and law (Thogersen et al., 2018). As noted by Shuh (1982), the flexibility of OBL makes it well-suited to cater to different learners from diverse educational contexts. This adaptability is attributed to the accessibility of educational materials and the ability to customize content (Griffith, 2003). Thus, demonstrating the potential of OBL to deliver content effectively to learners in design education for eco-social justice.

2.2 Eco-Social Justice

Eco-Social Justice (ESJ) refers to the interconnectedness of ecological and social justice. Jaffe and Gertler (2008) affirm that ESJ, as the centre of sustainable development, involves interactions of natural and social systems. Additionally, Wang and Altanbulag (2022) emphasize that ESJ prioritizes the interdependence between nature and society. Specifically, Attfield (2021) made a call for ESJ by acknowledging the role of racial injustice, colonialism, and capitalism in creating social divides and environmental disasters.

In this paper, ESJ stands for the intertwined relationship between climate action and social justice. Eco-Social Justice serves as the contextual content for integrating object-based learning into design education within the creative arts university.

Design education lays the foundation for educating and inspiring future designers, who have the skills to support human activities towards eco-social justice (Franz & Elzenbaumer, 2016). This paper aims to embed ESJ in curriculum design within design education by designing OBL artefacts and learning and teaching sessions.

2.3 Research process

The research through design demonstrated by Koskinen et al. (2011) explained integrating design and research to stimulate thinking through experiments with prototypes in the real contexts of use design-lead method is one orientation of research through design, that addresses complex issues through design thinking and strategies (Winter-Simat et al., 2017).

The research adopts case study as a methodology, defined by Yin (2014), which describes it as "an empirical inquiry" that studies a "real-life" (Creswell & Poth, 2016; Yin, 2009) context in-depth. The methodology is characterized by being "particularistic, descriptive and heuristic" (Merriam, 2009, p. 46). The proposed research draws on two case studies conducted at an art and design university on a BA (Hons) Design Management and MA Design Management course. These courses act as a platform and a host for the doctoral research. Following Yin (2014) suggests that the use of multiple cases is "more substantial" for analytic benefits.

Design Management (DM) is a non-traditional subject centred on the convergence of design and business. As a cross-disciplinary design education field, DM provides an ideal learning and teaching environment for OBL practices in the research, including and beyond design.

The three-year BA and one-year MA Design Management courses provide opportunities to collect data through various sources of evidence (Yin, 2014, p.106), including documentation, interviews, direct observations, and physical artefacts. Notably, the researcher will design curriculums incorporating objects as "important component" (Yin, 2014, p.117) for teaching staff to use in the classroom. By involving observational evidence (Yin, 2014, p.114) in the classroom, the researcher will gather invaluable insights for understanding the actual utilization of the curriculum that is being designed.

As such, these two case studies have the potential to be successful research for OBL in combining education for climate and social justice.

3. The opportunities of OBL to embed eco-social justice in curriculum design

This paper will delve into the various methods of designing and embedding OBL artefacts into learning and teaching (L&T) sessions, aiming to enhance the educational experience of eco-social justice.

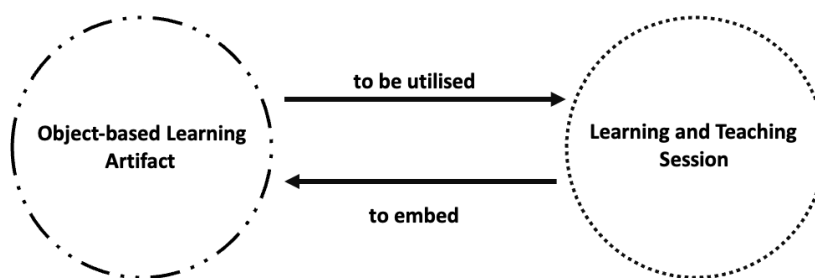


Figure 2. The relationship between OBL artefact and L&T Session

3.1 Designing OBL artefact to be utilised in learning and teaching sessions

In object-based learning, the use of objects is central to the learning process. Objects facilitate exploration, inquiry, and discovery, and engage learners in a diverse range of learning activities. When creating OBL artefacts, it is important to consider the design characteristics of the object, such as colour, material, weight, and shape, to ensure an effective learning and teaching experience. The analysis from Banning & Gam (2020) highlights that the unique characteristic of OBL relates to an artifact's sensory reactions, including sight, touch, sound, and smell, as well as personal reactions including size, feel, personal preference, and emotions.

Colour

The use of colour is an essential element when designing OBL artefacts for effective learning experiences. Colour plays a critical role in communicating messages (Sherin, 2012) and can impact the design of OBL artefacts to enhance learning outcomes in the following aspects:

- Attention: Colour is an effective tool for grabbing and holding learners' attention (Sherin, 2012), which results in longer attention spans (Bailey, 2014).
- Memory: Studies (Bailey, 2014; Zavarueva et al., 2022) highlights that colour enhances memory retention, which assists learners in associating colour with the concepts.
- Symbolism: Colour can be used to symbolise concepts, elicit meaning, and represent cultural relevance (Sherin, 2012).
- Discrimination: Holtzschue (2012) states that colour can instantly distinguish between things of the same or similar form and size.

As eco-social justice has complex relationships across multiple stakeholders (Vucetich et al., 2018), it involves abstract concept and personal experience. The effective use of colour in designing OBL artefacts can significantly enhance the learning and teaching experience by capturing attention, improving memory, symbolizing meaning, providing instant discrimination, and expressing emotion. Therefore, it is essential for educators to consider colour as a critical component when designing OBL artefacts for use in learning and teaching sessions.

Material

In the context of OBL in design education, material is one of the crucial parts in design process. It serves as the components that designers utilize to envision and refine messages. Thus, materiality is being more than just an object but a part of a broader system of storytelling, experiences, and experimentation (Ashby & Johnson, 2013). If we consider materials from a designer's perspective rather than a teacher's perspective, materials actively participate by offering ways of engagement and manipulation. Parisi et al. (2017) emphasizes the importance of the tactual senses and affirms that the increasing number of courses and workshops support students in experience materials through hands-on learning (Tiballi, 2015).

OBL can incorporate various objects and materials that can integrate into art classrooms, ranging from museum collections (Chatterjee, 2011; Chatterjee et al., 2016; Kador et al., 2017) to items found in everyday life (Burkhart, 2006; Kador et al., 2017). Based on the previous experiments from educators, the following material typologies can also be utilized in the design of OBL artefacts:

- Existing human-made material: The case studies Sustainability Design Cards (Ræbild & Hasling, 2018) and Critical Alphabet (Noel, 2020), illustrate the process of using tangible material as teaching tools. Paper/card as one of daily-use materials that can be easily applied to create OBL artefacts.
- Self-produced material: Parisi et al. (2017) applied low-tech or Do It Yourself (DIY) materials in their creative experiments. They agree that DIY materials allow more control during the creation process.
- Natural material: The integration of natural resources like plants, sand, mud, rainwater, and stone have the potential to develop OBL artefacts in the classroom, especially when addressing ecological topics.

The utilization of materials in OBL artefacts holds significant potential for integrating a diverse range of artefacts that address the important theme of eco-social justice. Moreover, it enables the evaluation of the environmental and social relevance of objects through product life cycle

assessment (Klein & Phillips, 2011). Materiality, being a key aspect of eco-social justice, not only can directly capture the environmental impact but also serves as a medium to communicate cultural and social narratives, shedding light on issues of inequality, exclusion, and environmental degradation.

Size and weight

Chatterjee (2008) highlights that while traditional teaching styles predominantly emphasize verbal and visual modes of engagement, object handling presents prospects for involving individuals through the sense of touch. Meanwhile, OBL can be used as a tool for investigating cultural perspectives, the exchange of personal reflections, and ideas creates opportunities for conversing during “handling the object” (Chatterjee et al., 2016, as cited in Banning & Gam, 2020).

Given the significance of haptic engagement in OBL, the development of hand-held artifacts with appropriate scales and weights for discussing eco-social justice in the classroom environment holds promise for fostering positive influence in learning and teaching session.

The effective use of design characteristics, such as colour, material and size, in designing OBL artefacts can create opportunities for multisensory learning and haptic engagement, thereby enhancing the educational experience of teaching eco-social justice within design education.

3.2 Design Learning and Teaching (L&T) sessions to embed Object-Based Learning (OBL) artefacts

This section explores how L&T session are designed to embed OBL artefacts. To design effective learning and teaching sessions that embed OBL artefacts, several key considerations should be considered.

The selection of appropriate OBL artefacts is essentially needed. OBL artefacts could be selected (either by teacher or/and students) based on their relevance to the topic being taught and their potential to facilitate student’s active learning. The following typologies of artefacts that can be embedded in L&T sessions can be considered:

- Museum artefacts

In the last decade, many educators and researchers have defined object-based activities with museum collections as a means of facilitating cross-disciplinary studies in the classroom (Chatterjee et al., 2016; Chatterjee, 2008; Hardie, 2015; Kador & Chatterjee, 2020; Romanek & Lynch, 2020; Rowe, 2022; Schultz, 2018; Simpson & Hammond, 2012; Thogersen et al., 2018; Williams, 1982). Banning and Gam (2020) offers a study in art and design subject, where students analysed examples of dress presented by lecturers from university collections.

Pinto and Benneyworth (2019) conducted a case study for decoloniality by applying OBL in a national art museum. Their research contributes to the integration of museum objects into the L&T environment, with the aim of enhancing equity, social justice, and democracy. Furthermore, embedding museum objects into eco-social justice education enables learners to critically examine the historical and societal dimensions of eco-social issues by actively engaging with cultural artefacts.

- Already-made object selected by students or/and teachers:

The research of Lomas and Costantino (2022) analyses “common/shared objects” that students were given the option to choose their own objects, including face mask, t-shirt, trainers, jeans and so on. This provided learners with an opportunity to engage and interact with everyday objects, allowing them to obtain sensory experiences. In another case study, *The Power of Wow* (Hardie, 2008), students were invited to select an object that elicited a “wow” response without any verbal

explanation. This OBL activity encourages students to think actively and critically about the message communicated by an object.

The process of self-selection of already-made objects, not only empowers students to express their unique perspectives on eco-social justice issues based on their personal experiences and diverse backgrounds, but also provides opportunities to develop a critical perspective on the eco-social interrelatedness and the specific locations of justice within this relationship.

- Learning and teaching tool

A learning and teaching tool/object is typically designed by teachers and engaged by students. As an example, Smith (2016) presents 3D printed biological molecules as active learning tools, to stimulate students' engagement in lectures. By handling 3D prototypes, students can gain a deeper understanding of abstract biological processes.

The process of physicalizing pre-designed teaching tools can also be applied in design education to explicate conceptual meanings. Eco-social justice, as an abstract topic, cannot be physically touched, but OBL presents an opportunity for educators to materialize the abstract concept and utilize pre-designed artefacts as pedagogical tools. Additionally, the artefacts to be embedded in L&T sessions can also be co-created by teachers and students, thereby fostering collaboration, enhancing creativity, and promoting social and peer learning.

In the process of designing L&T activities, it is crucial to provide clear and concise instructions (Barton & Willcocks, 2017) to accompany the artefacts to support individual exploration. Additionally, it is important to carefully consider who selects or creates the objects, and the duration of engagement with the artefacts.

As Hardie (2015) suggests, OBL practice can be situated within various theoretical perspectives and pedagogical contexts. Educators can employ David Kolb's Experiential Learning Cycle as a theoretical framework (Chatterjee & Hannan, 2016; Cobley, 2022; Duhs, 2011) to enhance student engagement. This cycle emphasizes active participation, reflective analysis, and the practical application of acquired knowledge to real-world scenarios, thus fostering the generation of new experiences (Larson & Valdespino, 2023). Object-based learning supports teachers in bringing objects into the classroom as part of the continuous experiential learning process.

Assessments ought to be designed to measure students' understanding of the artefacts and their ability to apply their learning in real-world contexts. Waxman and Eash (1983, p. 321) suggested that using self-report tools to gather student responses has been proven to be a dependable and valid approach to assessing their classroom environment. Although numerous studies concur on the educational value of OBL, developing evaluation criteria that truly gauge the effects of the experience of learners, and assess its short-term and long-term influence on students can pose challenges (Larson & Valdespino, 2023).

4. Conclusion and future development

This paper draws attention to designed object-based learning (OBL) artefacts using learning and teaching methods and aims to intergrade eco-social justice in curriculum design within design education. The current study synthesizes key literature from leading educators in OBL, offering valuable insights into the flexibility of this approach and providing an argument for its suitability in the L&T of eco-social justice. Through interaction with objects, OBL provides a multisensory learning experience and leads the conversation on eco-social justice within design education.

OBL offers a shift from instructor-led lectures (Banning & Gam, 2020) to prioritize student-centred learning experiences with physical object engagement. This approach aligns well with the design discipline, which places great importance on creating and making artefacts.

Future research in object-based learning (OBL) for eco-social justice could explore its potential through empirical research within various design education subjects. Another area of further development could be the impact of OBL on learner engagement. Research could investigate the relationship between OBL and learners' experience, examining how the use of objects in learning can enhance learning and teaching in climate action and social justice.

Design educators can play a significant role in producing graduates who are prepared to handle the issues of the twenty-first century by integrating eco-social justice into the design curriculum through OBL. By highlighting the potential opportunities of OBL, it provides the chance to inspire other design educators to incorporate this approach into their transdisciplinary practices. In turn, this could lead to a more responsible and innovative design education that better prepares students for ecological and social problems in the future.

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About the Authors:

Lezhi (Crystal) Zhang, is a PhD student at the London College of Communication, University of the Arts London, with a background in industrial design. Her doctoral research explores embedding artefacts into curriculum design in design education towards eco-social justice.

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