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Transforming Education: Add-On Workshops as a Tool to Integrate Ethical Responsibility in Design Education

Elisabeth M. Friesinger
Technical University of Munich, Germany
elisabeth.friesinger@tum.de

Stephan Krusche
Technical University of Munich, Germany
krusche@tum.de

Abstract: Design education plays a critical role in shaping sustainable societal and environmental futures, making ethical responsibility essential. This paper examines the integration of short, flexible workshops into courses to intertwining ethics and sustainability across diverse educational contexts. Implemented at three German Universities of Applied Sciences, the workshops aimed to raise awareness and encourage students to engage with ethical challenges in their design practice. A mixed-methods evaluation, combining post-workshop surveys and facilitator observations, found that the workshops appear to increase students' awareness and understanding of their responsibilities as designers. Key success factors included an informal, interactive format and adaptability to educational contexts. Limitations included student uncertainty in applying ethics, indicating a need for supplementary activities. This research highlights the potential of short workshops to overcome institutional barriers and promote responsible design practices, with future work needed to expand the approach and assess its long-term impact.

***Keywords**: design education, responsibility, sustainability, ethical considerations*

Introduction

Humans have an enormous power to design the world – not without reason the current era is also referred to as the Anthropocene (cf. Crutzen, 2006; Crutzen & Schwägerl, 2021). Within the Anthropocene, the world is, at the same time, an object and result of design (cf. Borries, 2016) – this inevitability of design should emphasize the responsibility that comes with it.

Today's crises — from global warming to biodiversity loss — reveal the 'structural unsustainability' (Sommer & Welzer, 2017, p. 34) of contemporary society. Sommer and Welzer (2017, p. 27ff) highlight a dual potential, suggesting that humanity faces a choice: transformation "by disaster" or "by design." The former involves passively awaiting collapse, while the latter advocates proactive, deliberate action to reshape existing systems before they fail. Design, therefore, becomes not just a creative practice but a moral responsibility, holding the power to address challenges such as climate change, resource depletion, and social inequality (cf. Borries, 2016). Yet, western design practices have historically been limited in scope, often overlooking diverse human needs and broader environmental impacts (cf. Mareis & Paim, 2021, p. 11). Victor Papanek (2009, p. 11) emphasized since the 1970s, that design implicated various forms of environmental harm – also arguing that design can transcend these challenges and become a transformative force.

In recent years, various educational interventions have attempted to address this. These initiatives range from embedding values, critical reflection, and ethical awareness into design processes (cf. Boehnert, 2013; Nilsson & Hansen, 2021; Sadowska & Hanrahan, 2023) to developing practical teaching tools and formats (cf. Boehnert, 2013; Campanella et al., 2021; Lund et al., 2023; Mateus-Berr et al., 2013).

Problem

Nevertheless, current design education still struggles to incorporate these perspectives. It often falls short in preparing students to navigate the complex interplay between technical, aesthetic, social, political, and environmental dimensions in professional design practice (cf. Spitz, 2021, p. 63). If integrated, ethics in design education is often treated as a separate subject rather than being fully embedded in the curriculum, leaving students with limited guidance on how to meaningfully integrate ethical considerations into their own projects (cf. Sonneveld, 2016). This highlights the need for a solution that addresses the issue of integrating social and environmental impact considerations into design education and challenges its integration within universities by overcoming institutional barriers.

Objective

This paper presents a flexible workshop format that supplements existing curricula. It aims to empower students to engage with their responsibilities as designers through practical, reflective, and actionable learning experiences. The case study evaluates how this format helps future designers recognize and act on their responsibilities.

The research questions (RQ) addressed in the case study are as follows:

RQ1 Overcoming Barriers in Education: What strategies can universities implement to overcome barriers and resistance to change when integrating ethical responsibility and sustainability into design education?
RQ2 Designing Supportive Workshops: How should workshops be designed to encourage students to engage with ethical considerations, responsibility, and sustainability topics positively without feeling overwhelmed?

The study addresses its research questions through the development and evaluation of add-on workshops in three educational settings (RQ1). Post-workshop surveys captured student experiences with structure, content, and format (RQ2).

Intervention & Design Methodology

Framework for Designing Educational Interventions: The Role of Design-Based Research

To understand the methodological foundation of this study, this section describes the Design-Based Research (DBR) approach that informed the development and implementation of the add-on workshops as interventions, following the principle of ‘research through design’ (Reinmann, 2020). DBR is particularly suited to educational research as it provides a phased and iterative framework that guides the creation, testing, and refinement of interventions in real-world educational settings (cf. Reinmann, 2005, p. 60).

The strength of DBR lies in its structured phases—goal setting, design, development, testing, analysis—which offer a clear process for designing educational interventions. This methodology ensures that innovations like the workshops are both relevant and theoretically grounded. In this study, each of the three workshops represents an individual intervention, each with unique outlines, planning requirements, and evaluation processes. At the same time, all workshops are part of the same DBR process, where insights and outcomes from each iteration contribute to the overall conclusions (see figure 1).

Through this iterative process, DBR enables continuous improvement of the workshops, ensuring they remain aligned with students’ needs while being adaptable to diverse university environments. This approach ensures that the workshops not only address immediate educational challenges but also generate valuable insights for broader pedagogical innovation.

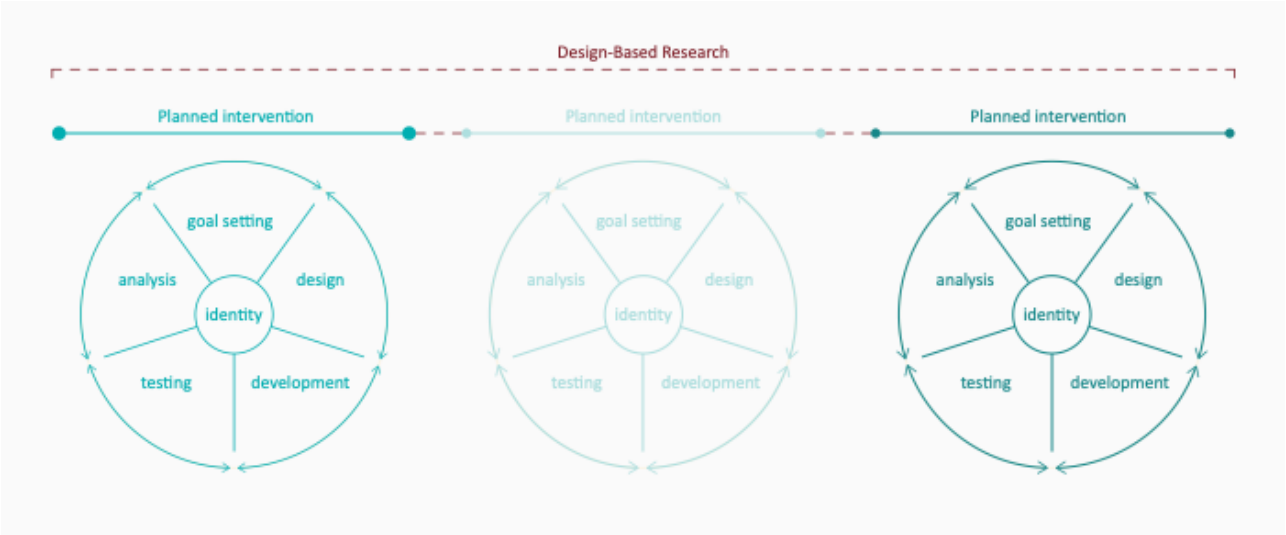

Figure 1. Design-Based Research as the overarching process for this case study with three designed interventions, own visualization inspired by Reinmann (2020, p. 5).

Case Intervention: Add-On Workshops

The add-on workshops were designed as concise, interactive interventions that encourage students to critically examine their responsibility in design practice. Grounded in learning objectives based on Bloom's Taxonomy (cf. Bloom, 1956; Ouden & Rottlaender, 2017, p. 60), they aim to foster awareness, analysis, and application of ethical considerations through a hands-on, student-centered approach. The workshops aimed to achieve the following learning objectives:

1. **Recall** the responsibility that is inherent within design practice (remember).
2. **Recognize** privileges by identifying how diverse backgrounds and experiences shape perspectives (understand).
3. **Implement** ethical considerations to the course-related project by integrating them into the students' own project work (apply).
4. **Differentiate** between ethical and unethical design practices by examining real-world examples that demonstrate the impact of conscious design choices (analyze).
5. **Question** the impact of the conscious decisions made by applying their responsibility into course related project (evaluate).
6. **Develop** design concepts that incorporate ethical principles and address societal and environmental challenges (create).

These objectives formed the foundation for all workshops. While structure and goals stayed consistent, activities and tools were adapted to each course's context. The next section explains how this was applied in practice.

Implementation

The workshops were implemented in three undergraduate courses at German Universities of Applied Sciences (see Table 1). Each setting had a unique disciplinary focus, showing how the same pedagogical framework could adapt to varied contexts.

Table 1. Overview of the educational context where the add-on workshop format has been tested.

#	University of Applied Science	Program	Semester	Course	Participants
1	Augsburg	Bachelor Communication Design	4	Design Ethics	~70 (split in 4 groups with max. 20)
2	Neu-Ulm	Bachelor Information Management and Corporate Communications	6	User Experience Design	~26
3	Landshut	Bachelor International Business	3	Marketing	~24

The next subsections describe how each workshop adapted its timeline, content, and tools to meet specific course needs while staying aligned with the shared pedagogical concept.

Tools and Exercises Used

The workshops used selected tools and exercises to help students reflect on responsibility in their design practice. These were chosen to challenge assumptions and support socially and environmentally aware thinking. Doing this, the workshops examined examples from books, videos, and campaigns that reproduce harmful stereotypes or discriminatory logics. These examples were not shown to legitimize them, but to help students understand harmful dynamics and learn how to challenge them.

One foundational concept introduced at the beginning of each workshop was the “brain, heart, and gut” model of the 'good' designer from Shoshin (2018, p. 90). This visual metaphor considers ethical responsibility not just as an intellectual task ("brain"), but also as a matter of empathy ("heart") and intuition or conviction ("gut"). In the workshops, it served as an accessible entry point for connecting personal values to professional decisions.

An activity used in every workshop was the Privilege Walk (cf. McIntosh, 1988). Participants physically moved forward or backward in response to a series of statements designed to reveal how lived experiences and social positioning can vary. To ensure psychological safety, the questions were carefully phrased, and students were told they could choose not to respond to any statement. The activity was followed by open discussion, allowing emotional processing and collective reflection on how social inequities impact the design profession and educational access.

In Augsburg and Neu-Ulm, students watched excerpts from Morris’s (1999) documentary *Mr. Death*, where Fred A. Leuchter explains his redesign of the electric chair. His statements were mapped to Dieter Rams’ ten principles of good design (Figure 2). This juxtaposition was originally introduced by Michael Erlhoff (2021, p. 19f.), whose critical reflection served as a guiding idea. The confrontation challenged students to question whether design “rules” are sufficient, or if intent and consequences must take precedence.

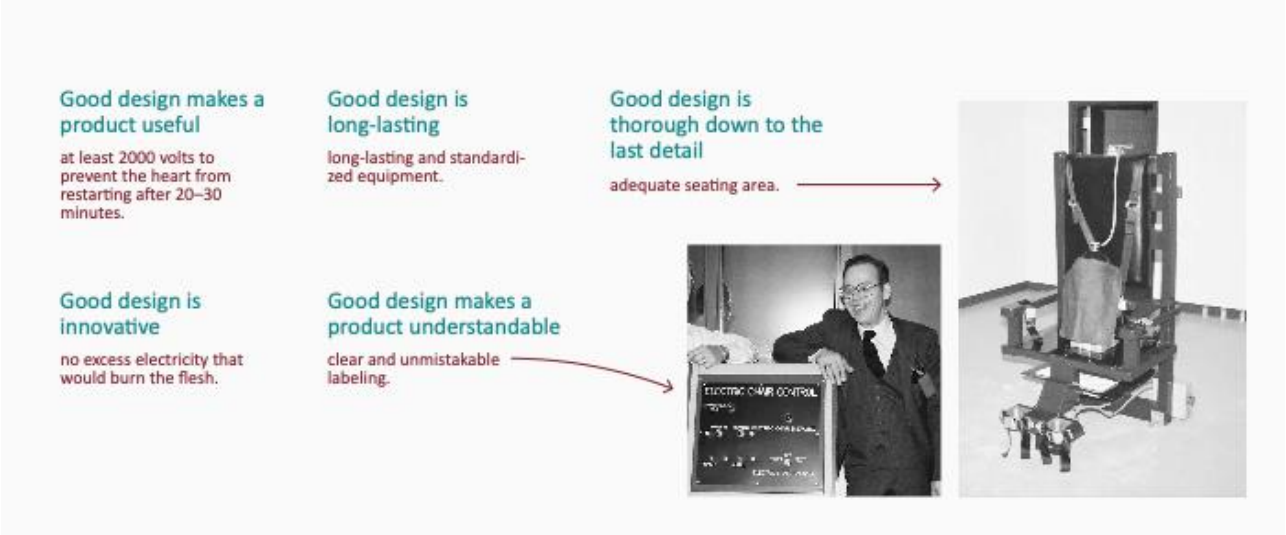

Figure 2. Exemplary material provided during the workshop on user experience design to foster critical thinking and discussions. The figure illustrates how the "10 Theses for Good Design" by Dieter Rams (o.D.) were mapped to the statements the designer Fred A. Leuchter made during his interview about his design of the electric chair (Morris, 1999).

In the workshop in Landshut, the focus on ethical marketing was anchored by a curated set of harmful and/or discriminatory marketing practices, such as *pink it and shrink it*, *racial stereotyping*, *cultural appropriation*, *greenwashing*, *surveillance marketing*, and *body shaming*. Students were invited to first define and discuss these concepts collaboratively before being shown structured examples from real campaigns. This exercise helped surface how marketing strategies can reproduce harm, sometimes unintentionally, and laid the groundwork for ethical critique within a commercial context.

The practical phase of the workshops in Landshut and Neu-Ulm was supported by 'Conscious Service Design Methodologies' (cf. Friesinger, 2024), which were specifically designed to support socially and environmentally conscious product design:

- **In Neu-Ulm:** Critical Reflection Cards offered students guided questions such as "Who is excluded from this design?" or "What unintended consequences could emerge?" These cards helped participants integrate ethical questions directly into their course projects.
- **In Landshut:** Inclusive Segment Cards helped students construct marketing user segments in a way that surfaced issues of power and privilege, challenging reductive stereotypes and promoting more inclusive communication strategies.

These tools enabled experiential learning, situated reflection, and dialogic engagement. The practical phase in the workshop in Augsburg was not supported by a specific tool, as the students started to prototype for themselves what would help them to apply their responsibility into design practice.

Workshop Timeline

The workshops differed in terms of duration and professor involvement. In Augsburg, the workshop lasted 3.5 hours with a 30-minute break and was conducted without the professor's active participation. In Neu-Ulm and Landshut, the professors participated in the 2-hour workshops (including a 15-minute break). All workshops were conducted on-site and combined plenary discussions with smaller group activities.

Workshop Content

All workshops followed a three-phase structure: Discover, Understand, and Apply. Though the phases remained the same, timing and content varied by course. Activities were aligned with the overarching learning objectives to support progression from knowledge recall to application. Content was tailored to fit each course's context and students' experience.

Discover (30–45 minutes)

This phase introduced the concept of considering 'responsibility' as designers and prompted students to consider their personal stance.

- **All courses:** Students encountered the brain-heart-gut model of ethical design decision-making by Choi (2018) and were asked: *"What responsibility do we, as designers, carry?"*
- **Augsburg & Neu-Ulm:** Students discussed "good design" using Dieter Rams' 10 principles, and reflected on Fred A. Leuchter's interview—provoking debate on whether unethical intentions can still produce "good design" by formal standards.
- **Landshut:** Students discussed a quote from Victor Papanek (2009) on harmful marketing practice and looked at different detrimental marketing principles (e.g., greenwashing, body shaming or tokenism).

Learning Taxonomy: remember.

Understand (30–60 minutes)

In this phase, students reflected more deeply on structural and systemic dimensions of responsibility.

- **All courses:** The Privilege Walk exercise (cf. McIntosh, 1988) served as a introduction to inequality. Follow-up discussions asked students to reflect on their thoughts, reactions, and how privilege affects design outcomes.
- **Augsburg & Neu-Ulm:** Students were asked to map Leuchter's actions to Rams' principles and debate the implications, revealing tensions between form/function and moral intent.
- **Landshut:** Students discussed examples like "Pink it and shrink it" and linked familiar terms to real campaigns. They reflected on how naming problems can lead to change, setting the stage for critiquing marketing and its role in shaping social norms.

Learning Taxonomy: understand and analyze.

Apply & Reflect (45–90 minutes)

Students transferred theoretical insight into concrete design action, guided by context-specific tools and supportive questions. Each workshop closed with team presentations and reflective discussions.

- **Augsburg**: Students created prototypes of tools that could help them apply their responsibility to their own design practice. They generated ideas in teams, clustered concepts, and received peer feedback.

- **Neu-Ulm**: Students applied Critical Reflection Cards (cf. Friesinger, 2024) to examine how their projects could embody responsibility. This allowed a direct integration of ethics into their UX course project.
- **Landshut**: Using Inclusive Segment Cards (cf. Friesinger, 2024), students developed user segments that considered privilege and access, helping them rethink marketing segmentation with an ethical lens.

Learning Taxonomy: evaluate, apply, and create.

Evaluation

The primary data source was an online survey completed by students after the workshops. It included Likert-scale questions on structure, content, duration, and impact on ethical understanding, along with open-ended questions for deeper insights.Directly after the workshops, the students completed the survey. This resulted in three data sets, one per workshop site. In Augsburg, the course ran in four groups, and timestamps allowed analysis by group. As the findings did not show concrete differences within the separate groups, the findings from these workshops are summarized in the evaluation.

Ethical Procedure

Participation in the study was voluntary, and students provided informed consent before completing the survey. The research adhered to ethical guidelines, ensuring transparency about the study's purpose and confidentiality.

Results

In total, 78 students participated in the survey. The response rate across the three different workshops has been quite balanced.

Workshop 1: Augsburg, 45 responses (64.3% response rate)
Workshop 2: Neu-Ulm, 18 responses (69.2% response rate)
Workshop 3: Landshut, 15 responses (63.5% response rate)

In the following sub-sections, the students' feedback will be presented. Quotes from participants were selected manually to represent a broad spectrum of responses across all workshop locations. While no formal coding or thematic analysis was conducted, care was taken to include both positive, critical, and ambivalent perspectives to reflect the diversity of student experience.

Workshop Atmosphere and Student Engagement

The workshops' atmosphere played a crucial role in fostering participation and engagement (Question 2.1). Most students described the workshops as inspiring (64.1%), informal (58.9%), and stress-free (47.4%) (see figure 3).

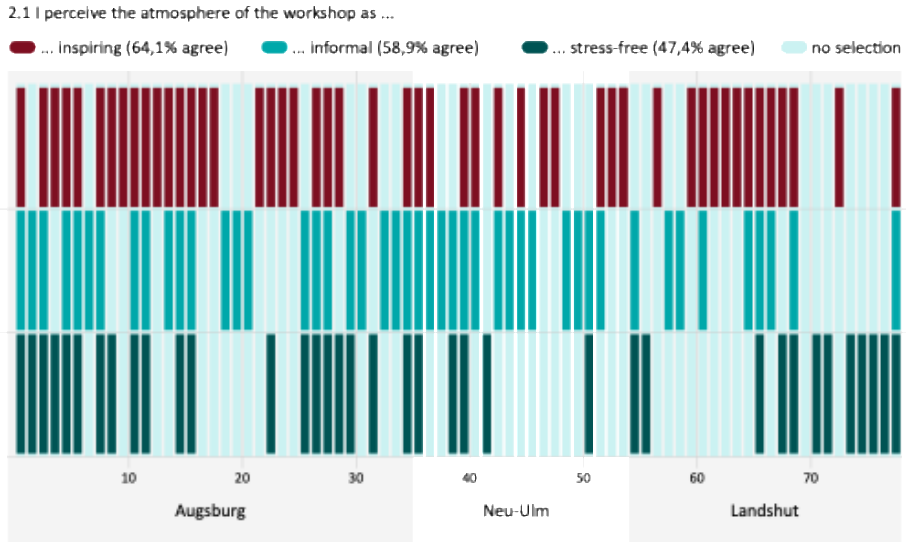

Figure 3. Visualizing the responses per student if they perceived the workshop atmosphere as inspiring, informal, and/or stress-free, showing a wide variation of the perceptions across the individual workshops.

In the open-ended questions, students across all workshops appreciated the relaxed atmosphere and the opportunity to discuss diverse topics openly. One participant from Augsburg noted, “you didn't feel condemned to speak your mind” (#AUX04), while a student from Neu-Ulm remarked the “inclusive exchange of ideas” (#NU10), and a student from Landshut highlighted the "friendly and welcoming atmosphere made it easy to engage" (#LA04). Across workshops, students valued the absence of judgment and the freedom to share their thoughts, which fostered a sense of belonging and active participation.

Workshop setting influenced perceived informality. In Augsburg (small groups, no professors), 71.1% found it informal; in Neu-Ulm and Landshut, this dropped to 50% and 33.3%. Engagement was strong across locations, with 75.6% reporting active participation. A respondent from Neu-Ulm noted the “interactive elements that clarified the challenges of conscious decision-making” (#NU07). This engagement was consistently high across all locations, with slightly higher participation in Augsburg (84.4%).

Organization and Comprehensibility of Workshops

The workshops were highly rated for their organization and structure, with all participants (100%) agreeing the sessions were well-organized and 94.8% finding the content comprehensible. Students valued the workshops' thoughtful design, with comments such as, "I found everything very well-structured, diverse, and interesting" (#AUX27) and "I especially liked the open and mutual exchange, and that the flow of the course developed organically (e.g., discussions were allowed to happen when they arose)" (#AUX24).

The ‘Privilege Walk ’ generated significant discussion and reflection. One student called it “the best part,” saying it raised awareness and offered a new view on gratitude (#NU17). Some, however, felt discomfort (#LA05, #NU06), highlighting the need for careful facilitation and optional participation. Clear framing ensures these exercises remain effective and inclusive.

Duration and Discussion Quality

The duration of the workshops received mixed feedback. Most students (55.2%) were satisfied overall, with higher satisfaction in the shorter sessions in Neu-Ulm (72.2%) and Landshut (66.7%). In Augsburg, where workshops were longer, only 44.4% were satisfied, though 37.8% wanted even more time for discussions. Conversely, Neu-Ulm and Landshut participants rarely felt the shorter workshops were too brief (see figure 4).

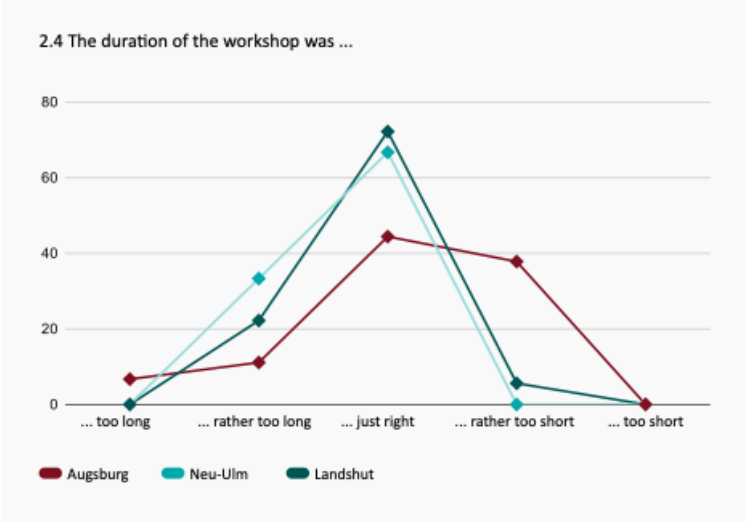

Figure 4. Perception of workshop duration. Feedback indicates that the 2-hour workshops in Neu-Ulm and Landshut were perceived as ‘just right.’ In contrast, responses from students in Augsburg regarding the 3.5-hour workshop show a notable portion found the duration to be ‘rather too short.’

Open-ended responses provided additional nuance to these findings. In Augsburg, several participants appreciated the opportunity for in-depth discussions but felt that certain segments could have been more concise. In Neu-Ulm and Landshut, where sessions were shorter, feedback highlighted a preference for maintaining brevity. One respondent stated that the workshop "struck a good balance between time and content, making it easier to stay engaged" (#NU12). However, there were also requests for slightly more time to expand on certain discussions. For example, a

participant from Neu-Ulm noted, "A little more time for reflection would help solidify the insights from the activities"(#NU28).

Learning Outcomes and Ethical Awareness

The workshops appeared to meet the learning objectives, with 83.3% agreeing that the workshops enhanced their understanding of their responsibilities as designers (Question 4.3). Results were consistent across locations: Augsburg (88.8%), Neu-Ulm (77.7%), and Landshut (73.2%). 67.9% of students indicated they had learned a lot during the workshops (Question 3.2), some respondents (particularly in Neu-Ulm at 50% and Landshut at 40%) expressed uncertainty about their learning outcome. This hesitancy may reflect the immediacy of the survey, conducted directly after the sessions, which might not have allowed sufficient time for reflective consolidation of learning. Although many students reported learning a lot, only 53.8% felt fully prepared to act on the ethical responsibilities covered (Question 4.4). This indicates that while the workshops appeared to increase students' awareness and understanding, they might require supplementary activities—such as ongoing support or extended discussions—to reinforce students' sense of preparedness (see figure 5).

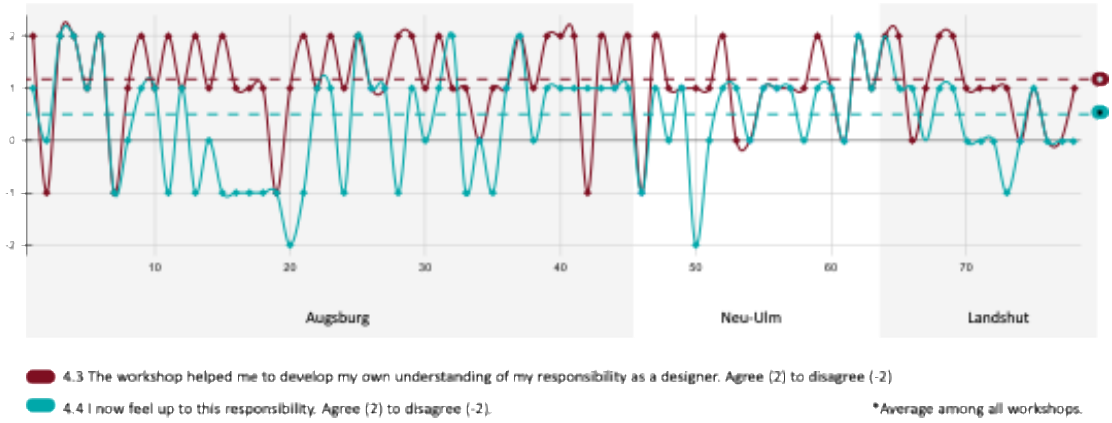

Figure 5. Visualization of the relationship between participants' perception of having developed an understanding of their own responsibility and their self-assessment of this responsibility. The figure highlights that while many students have developed an understanding of their own responsibility, they do not feel equally equipped to fully meet this responsibility.

Open feedback highlighted the workshops' thought-provoking nature, with one participant stating, "The workshop opened my eyes to the responsibilities designers have in shaping society" (#NU03). Another noted, "It made me think more about the ethical implications of my work and the importance of responsible design" (#AUX28). These insights indicate that the workshops successfully stimulated reflection on ethical topics.

However, some students expressed a need for more concrete guidance on how to translate this newfound awareness into actionable steps. One student noted: "The workshop was a good start, but it would be helpful to have follow-up sessions or case studies to understand how to apply these principles in real-world scenarios" (#LA05).

Facilitation and Feedback

The facilitator played a pivotal role in the workshops' success, with 94.8% of students agreeing that the facilitators communicated the workshop content clearly, making complex concepts accessible. Additionally, 93.5% felt encouraged to participate, and 88.5% appreciated the personalized feedback, which enhanced the learning experience (see figure 6).

Open-ended responses praised the facilitators' clarity and engagement. One student noted, "The facilitator was very friendly and explained things in a way that was easy to understand, even for complex topics (#LA04)". Another highlighted the importance of constructive feedback, stating, "The feedback we received was very motivating and gave me new ideas for my projects" (#NU07).

Some feedback suggested improvements, such as providing more guidance on actionable outcomes and incorporating more interactive techniques to ensure all voices are heard during discussions.

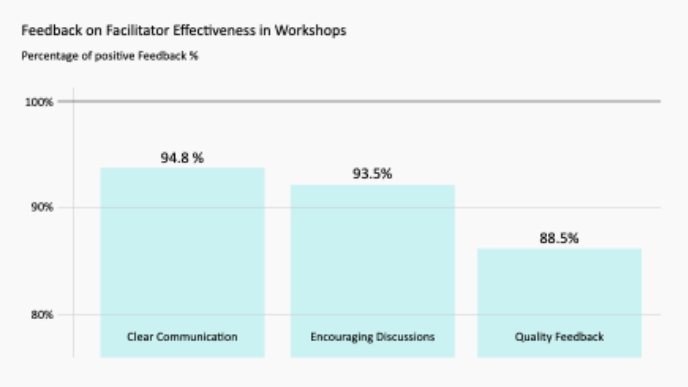

Figure 6. Visualization of feedback on facilitation across all workshops. The feedback was overwhelmingly positive, with participants emphasizing clear communication and the encouragement of discussions.

Relevance to Curriculum and Integration

Students strongly endorsed the integration of workshops into their courses (Question 6.3). 85.9% of students stated that the workshops should be part of the curriculum every semester, with the highest support in Augsburg (93.2%) compared to Neu-Ulm (77.8%) and Landshut (73.2%). Students appreciated the connection between workshop content and practical applications, with comments such as, "The topics addressed are critical and should be a core part of our education" (#AUX19) and "It linked ethical theory with real-world challenges" (#NU03). The feedback from the professors who taught the courses has also been positive. All of them have been able to integrate the workshops into their courses in the form of guest lectures, and some have even incorporated parts of the workshop into their exams, finding the input valuable and wanting to ensure that the students retain it in their learning.

Limitations

Internal Validity

Although the workshops followed a shared structure, variations in workshop duration, professor involvement, and participant demographics introduce potentially confounding factors. Additionally, facilitator characteristics and interpersonal dynamics may have influenced student experiences and outcomes, particularly in activities that relied heavily on open discussion and personal reflection. These contextual differences should be considered when interpreting the findings.

External Validity

Implementing the workshops at three German universities supports generalizability within that region. However, results may not apply to other cultural or academic settings. Furthermore, the study exclusively focused on undergraduate students, questioning its applicability to postgraduate education or professional training environments. Expanding the geographic and academic scope of future studies could address these concerns and further validate the adaptability of the workshop design.

Constructive Validity

While the workshops aimed to raise ethical awareness and encourage conscious decision-making, reliance on post-workshop surveys as the primary data source does not fully capture the depth of learning or the practical application of insights gained. While self-reported data provides valuable reflections, it is limited in its ability to assess long-term impact or behavioral change. Future work may benefit from pre- and post-assessments or longitudinal tracking to more rigorously evaluate learning outcomes and the sustained impact of the interventions.

Findings

This case study indicates that short, flexible workshops may be a promising approach for introducing ethical responsibility and sustainability into design education. Evaluation of the research questions (RQs) provides the following key insights.

RQ1 Overcoming Barriers in Education

The results suggest that short workshops are a practical and effective means of addressing institutional barriers. Their flexible design appeared to enable integration into different curricular settings across three German universities. Professors expressed openness to the format, due to minimal disruption to existing schedules. Students generally

responded positively, with 55.1% agreeing the duration was appropriate. Feedback on duration and discussion quality highlighted the importance of flexibility: shorter workshops in Neu-Ulm and Landshut were well-received, with most participants satisfied with the time allocation, while the longer sessions in Augsburg revealed that, although some students preferred shorter durations, a significant proportion wished for extended sessions to allow for deeper discussions. This underscores the need to adapt workshop durations to the specific needs and preferences of participants to balance engagement, focus, and depth across varied educational settings.

RQ2 Designing Supportive Workshops

Student engagement was notable, with 83.3% reporting increased understanding of ethical responsibility. A key factor appeared to be the inclusive and non-judgmental atmosphere. This environment, supported by active facilitation and responsive communication, seemed to encourage open reflection. Nonetheless, a small subset (7.7%) of students reported feeling overwhelmed, particularly among less experienced students such as third-semester participants in Landshut. While the workshops were adapted to local course contexts, the abstract nature of the topic may remain difficult for students who are still forming their understanding of design's broader societal role. This suggests that tailored workshops are essential. Simple examples and hands-on activities may be needed for less experienced students to help bridge the gap between abstract ethical principles and their practical application in design. While most students found the workshops inspiring and stress-free, only 53.8% of students felt fully equipped to act on these responsibilities immediately, indicating a need for further reinforcement through supplementary activities, such as follow-up sessions or mentorship opportunities.

Taken together, these findings suggest that the workshop format holds potential as a supportive and adaptable model for introducing ethics in design education. While the initial results are encouraging, limitations remain. Future iterations may benefit from deeper engagement strategies, stronger support for less experienced students, and refinements tailored to different institutional contexts. These insights provide a foundation for further research and development, ensuring that the workshops can be scaled and refined to maximize their impact across diverse educational environments.

Discussion

The dual potential of design, as highlighted by Sommer and Welzer (2017), is illustrated within this case study. The workshops helped raise awareness, but turning that awareness into action remains a challenge. Despite increased understanding, only 53.8% of participants felt prepared to act on these responsibilities, underscoring the need for additional support structures such as follow-up activities or mentorship programs.

The findings also point to several pedagogical insights. Short, interactive formats seemed to support participation and reduce barriers to entry. The informal and inclusive atmosphere played a central role in making responsibility accessible. At the same time, variations in student responses across institutions highlight the need to adapt both content and delivery. For example, students earlier in their studies may benefit from simpler examples and clearer scaffolding, while session length should be responsive to local needs and engagement levels.

Though developed for design education, the workshop model may be applicable elsewhere. Its modular structure offers adaptability, but further testing is needed to assess supportiveness in other disciplines and learning environments.

This study supports the feasibility of embedding ethical responsibility into design education and highlights its growing importance. By equipping future designers with the tools to navigate complex ethical challenges, we can ensure that design serves as a transformative force for societal progress. Building on these findings, further research should focus on refining workshop structures and assessing their long-term impact, thereby contributing to a more sustainable and equitable Anthropocene.

Conclusion

Short, flexible workshops support the integration of ethical responsibility into design education by addressing institutional barriers and fostering student engagement. The format promotes reflection in a low-pressure environment and can be tailored to diverse contexts. The findings offer a starting. To deepen impact, further steps are needed—especially to help students apply insights in real-world settings. Future work should explore how the approach can be adapted, scaled, and sustained across different educational and professional contexts.

References

Bloom, B. (1956). Taxonomy of Educational Objectives: The Classification of Educational Goals. *Handbook I: Cognitive Domain*.

Boehnert, J. (2013). Ecological Literacy in Design Education: A Foundation for Sustainable Design. In J. B. Reitan, P. Lloyd, E. Bohemia, L. M. Nielsen, I. Digranes, & E. Lutnæs (Eds.), *DRS // Cumulus: Design Learning for Tomorrow*. https://doi.org/10.21606/learnxdesign.2013.014

Borries, F. von. (2016). *Weltentwerfen: Eine politische Designtheorie*. Suhrkamp Verlag.

Campanella, A., Ferrulli, E., & Barbero, S. (2021). Rethinking experiential learning in design education: The shift of the systemic design course to a multimodal online learning environment. In E. Bohemia, L. M. Nielsen, L. Pan, N. A. G. Z. Börekçi, & Y. Zhang (Eds.), *LearnXDesign 2021: Engaging with challenges in design education*. https://doi.org/10.21606/drs_lxd2021.11.226

Choi, S. (2018). Making Things Happen: Design for Inclusivity, Diversity, and Humanity. In J. Ma, Y. Lou, & Y. Gong (Eds.), *Emergin Practices: Designing in Complexity* (pp. 80–90). Tongji University Press.

Crutzen, P. J. (2006). The "Anthropocene." In E. Ehlers & T. Krafft (Eds.), *Earth System Science in the Anthropocene* (pp. 13–18). Springer Berlin Heidelberg. https://doi.org/10.1007/3-540-26590-2_3

Crutzen, P. J., & Schwägerl, C. (2021). Living in the Anthropocene: Toward a New Global Ethos (2011). In S. Benner, G. Lax, P. J. Crutzen, U. Pöschl, J. Lelieveld, & H. G. Brauch (Eds.), *Paul J. Crutzen and the Anthropocene: A New Epoch in Earth's History* (pp. 141–144). Springer International Publishing. https://doi.org/10.1007/978-3-030-82202-6_12

Erlhoff, M. (2021). *Im Schatten von Design: Zur dunklen Seite der Gestaltung: Vol. Bauwelt Fundamente* (M. Erlhoff, E. Blum, J. Fezer, G. Fischer, & A. Schnell, Eds.; 1st ed.). Birkhäuser Verlag GmbH.

Friesinger, E. (2024). Introducing 'Conscious' Service Design: Redesigned methods to address environmental and societal issues. *Touchpoint*, *14*(No. 3), 55–60. https://doi.org/10.30819/touchpoint.14-3.11

Lund, F. K., Feast, L. E. E., & Laursen, L. N. (2023). Sustainability-in-Action? Toolkit for Transdisciplinary Design Education. In D. Jones, V. Clemente, J. Corazzo, N. Lotz, L. M. Nielsen, & L.-A. Noel (Eds.), *LearnXDesign 2023: The 7th International Conference for Design Education Researchers*. https://doi.org/10.21606/drslxd.2024.034

Mareis, C., & Paim, N. (2021). *DESIGN STRUGGLES: Intersecting Histories, Pedagogies, and Perspectives*. Valiz.

Mateus-Berr, R., Boukhari, N., Burger, F., Finckenstein, A., & Gesell, T. (2013). Social Design. In J. B. Reitan, P. Lloyd, E. Bohemia, L. M. Nielsen, I. Digranes, & E. Lutnæs (Eds.), *DRS // Cumulus: Design Learning for Tomorrow*. https://doi.org/10.21606/learnxdesign.2013.092

McIntosh, P. (1988). *White Privilege and Male Privilege: A Personal Account of Coming to See Correspondences Through Work in Women's Studies*. Wellesley College. https://www.wcwonline.org/images/pdf/White_Privilege_and_Male_Privilege_Personal_Account-Peggy_McIntosh.pdf

Morris, E. (Director). (1999). *Mr. Death: The rise and fall of Fred A. Leuchter Jr.* [DVD].

Nilsson, E., & Hansen, A.-M. S. (2021). Teaching values in design: A case study about how teachers Teaching values in design: A case study about how teachers enable students to go from knowledge to action enable students to go from knowledge to action. In E. Bohemia, L. M. Nielsen, L. Pan, N. A. G. Z. Börekçi, & Y. Zhang (Eds.), *LearnXDesign 2021: Engaging with challenges in design education*. https://doi.org/10.21606/drs_lxd2021.01.127

Ouden, H. den, & Rottlaender, E.-M. (2017). *Hochschuldidaktik in der Praxis: Lehrveranstaltungen planen*. Verlag Barbara Budrich.

Papanek, V. (2009). *Design für die reale Welt: Anleitung für eine humane Ökologie und sozialen Wandel* (F. Pumhösel, T. Geisler, M. Fineder, & G. Bast, Eds.). Springer-Verlag.

Rams, D. (o.D.). Der Wert von gutem Design. *Vitsœs*. https://www.vitsoe.com/de/ueber-vitsoe/gutes-design

Reinmann, G. (2005). Innovation ohne Forschung? Ein Plädoyer für den Design-Based Research Ansatz in der Lehr-Lernforschung. *Unterrichtswissenschaft*, *1*, 4–16.

Reinmann, G. (2020). Ein holistischer Design-Based Research- Modellentwurf für die Hochschuldidaktik. *EDeR – Educational Design Research*, *4*(2), Article 2. http:// dx.doi.org/10.15460/eder.4.2.1554

Sadowska, N., & Hanrahan, T. (2023). Tilting T&L – awakening responsible design practices via the senses. In D. Jones, N. Borekci, V. Clemente, J. Corazzo, N. Lotz, L. M. Nielsen, & L.-A. Noel (Eds.), *LearnXDesign 2023: The 7th International Conference for Design Education Researchers*. https://doi.org/10.21606/drslxd.2024.037

Sommer, B., & Welzer, H. (2017). *Transformationsdesign: Wege in eine zukunftsfähige Moderne* (Vol. 1). oekom Verlag.

Sonneveld, M. H. (2016). Ethics in Design Education: An Integrated Approach. In E. Bohemia, A. Kovacevic, L. Buck, C. Tollestrup, K. Eriksen, & N. Ovesen (Eds.), *DS 83: Proceedings of the 18th International Conference on*

Engineering and Product Design Education (E&PDE16) (pp. 608–613). https://www.designsociety.org/publication/39132/ETHICS+IN+DESIGN+EDUCATION%3A+AN+INTEGRATED+APPROACH

Spitz, R. (2021). *Designing Design Education* (iF Design Foundation, C. Böninger, S. Schmidhuber, & F. Frenkler, Eds.). avedition GmbH.

About the Authors

Elisabeth M. Friesinger is a doctoral candidate at the Technical University of Munich and a Transformation Designer. Her research focuses on integrating social and ecological sustainability into the creation of digital products through conscious design practices. She gives lectures and creates educational interventions to encourage responsibility and sustainability in design and computer science education.

Stephan Krusche is Professor of Computer Science at the Technical University of Munich. His research group, Applied Education Technologies, conducts interdisciplinary research in education, software engineering, human-computer interaction, and the application of generative artificial intelligence. He serves on the TUM EdTech Center board and advances diversity in computing through mentoring, outreach, and inclusive academic initiatives.