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MANAGING DESIGN TO ADDRESS COMPLEX ISSUES: SUSTAINABILITY, COLLABORATION, GENDER, AND SYSTEMS THINKING IN DESIGN MANAGEMENT EDUCATION

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ABSTRACT
This paper explores the critical role of design management education in addressing complex societal challenges, such as sustainability, inclusive collaboration, and social justice with a focus on gendered aspects. While design research has extensively investigated innovative tools and methods to tackle such issues, a gap remains in translating these critical perspectives into actionable practices. This paper argues that design management, as both a research area and a key part of design education, is crucial in bridging this divide. A renewed design management module was developed and implemented at two universities over four years, incorporating critical concerns like environmental sustainability, inclusive collaboration, social justice and empowerment with an emphasis on gendered aspects. The module structure included foundational principles for design management, newly emerging concerns, and systems thinking for societal change. Learning activities and assessments encouraged students to develop holistic and nuanced approaches to design management, tailored to their unique disciplines and career aspirations. Findings reveal that students gained practical and critical skills, enabling them to embed sustainability principles, manage diverse collaborations, and address systemic inequalities through design. Moreover, the module fostered an understanding of the interconnectedness of design within broader societal contexts. Embedding critical, ethical, and sustainable perspectives in design management education equips future practitioners to drive meaningful societal transformation through innovative and just design practices.

Keywords: design management, sustainable design, collaboration, gender-sensitive design, models of innovation

1 INTRODUCTION
The past two decades witnessed extensive design research on addressing complex societal issues, exploring and developing novel design tools, methods, and approaches in this pursuit. This was parallel to the broader adoption of design thinking due to its unique potential to creatively explore, distil, and develop responses to complex societal and political challenges, which led to its adoption in many other disciplines, mainly in management. As such, design is becoming an increasingly more interdisciplinary endeavour, incorporating a multitude of perspectives and methods. Critical perspectives are deployed to engage more with social and political issues or to question the political and social aspects of design practices and processes; however, these critical perspectives fail to translate into actionable practices for future designers [1]. The research and education on design management have not sufficiently explored and addressed the implications of this complexity in organisational contexts, which only hinders the potential of design practices. Design researchers' ethical ideals and practices in their work require time and resources for in-depth, critical (self-)reflexivity on existing harmful and exclusionary norms, discourses and practices. Design practitioners in the field often lack the time or resources needed, leading to potentially narrower perceptions of reality and the problem at hand, highly affected by the subjectivity of the practitioner [1]. However, the crucial gap between critical perspectives and real-life practices presents an opportunity to rethink the role of design management, both as an area of research and as the key capability to bridge this gap. This is where *design management* research and education become crucial in building not only the necessary critical perspectives in (future) designers but also the

capacity and resources to implement these perspectives in all aspects of their practice. Accordingly, this paper presents the development, implementation and implications of a new design management module structure. It was delivered at two universities with different approaches to design education, for two years at each university (four years in total), providing insights into its delivery and student learning.

2 BACKGROUND

Design management historically emerged to communicate the value of design as a differentiator for companies [2], a *tool or approach* for managing organisations [3], and a *facilitator* of change [4]. The concern in the early years was to communicate the financial value that design generates (in the form of monetary profit) to managers of organisations and argue for its central role in business success. This early concern persists to this day, especially for designers out in the field, who play along with management structures and metrics that quantify the added value of design. Despite increasing concerns about the undeniably harmful social, environmental and cultural impacts of design practice, as still performed in 21st-century organisations, design practitioners still operate and communicate the value of their practices within this reduced conceptualisation of value as profit [5]. Although societal change and wellbeing have been partially discussed in design management discourse as well, as Cooper and Junginger [6] also point out, this does not necessarily detach design management from its previous priorities of quantifying and measuring the monetary value of design.

This contrasts with the evolution of design research since the 1980s, which has long been arguing for the far more critical roles and ethical responsibilities of designers for the wicked problems of our age, be it climate change, social exclusion, poverty, and many other forms of social harms. Design research espoused increasingly more participatory and collaborative forms of design practices [7] that potentially facilitate more horizontal and inclusive management of design processes, communities and even society [8]. It adopted more strategic, long-term thinking by incorporating various systems thinking and transition frameworks and explored the role of design in envisioning just, sustainable futures and societal change towards them [9]. The abundance of design research indicates a sustained belief in the perceived impact of design and a more in-depth exploration of this potential across the globe. These approaches inspire future design practitioners at universities, as design scholars impart these critical perspectives on design practice. However, what seems to be overlooked is the prevalent reality of the role of designers in the existing neoliberal market, and the perception of design as a tool for generating primarily financial value within these conditions.

The growing popularity of design thinking has resulted in a broader understanding of its application as a mindset for problem-solving in every aspect of organisations and change [10]. However, such design applications overlook the importance of adapting the required tools and techniques to specific problems [11]. They also invoke the question of whether designers are truly equipped to address these significant societal challenges in the first place [12]. More recently, the fundamental limits of design in driving societal transformation have been scrutinised, focusing on both the prevailing theories and practices, as well as their limitations and adverse effects [13–15]. Lacking both critical lenses grounded in socio-political theories and design tools, methods and processes that embody such theories, design practitioners straddle between their ethical responsibilities and the strategic goals of organisations they work for/with. There emerges the need to manage design without reframing the magnitude of social and environmental harms of design practices as tolerable and manageable and turning it into a tool of *daunted managerialism* (i.e. creating a false sense of effectively managing these harms) [1, 16].

Accordingly, this paper recalls the mission of the *design management* field, of generating tools, formalising design processes and communicating its critical role in organisations, and reinterprets that mission for the more critical, ethical, just design practices as envisioned and performed in design research. Mirroring the concerns of the field, design management education (as standalone programmes or modules within design programmes) also focuses on nourishing design-aware managers or management-aware designers, with a focus on fostering the ability to recognise, acknowledge and communicate the value of design, and developing a shared understanding between designers and others in organisations across all levels of design application. As such, design management education focuses on design briefs, formalised design and product development processes, and quality assurance processes [6]. While important in managing design, these aspects should somehow incorporate the practical implications of more critical, inclusive and just design approaches and practices in line with the design corpus proliferating with such concerns. This involves incorporating tools, methods, processes and alternative forms of management for more critical stances on (a) environmental sustainability beyond

eco-efficiency, (b) radically different forms of horizontal collaboration and participation, (c) reproduction of harms in the multitude intersections of gender, sexuality, race, ethnicity, class, belief, and many more, and (d) the larger systems all these occur in and be impacted by design practices.

3 RENEWED DESIGN MANAGEMENT MODULE

In line with the above discussion, this paper presents a design management module, redesigned back in the 2020-2021 academic year to incorporate the critical role of design in societal change and the ways it can be enacted in the real world, within organisations and communities, throughout design processes and reflected in design briefs. The intended learning outcomes (ILOs) were revised as follows:

1. Understand what design management entails and explore its key theories, issues, and concerns.
2. Critically evaluate various approaches to design management.
3. Embed contemporary design concerns into the design processes and management, including environmental sustainability, inclusive collaboration, and justice and empowerment with an emphasis on gendered aspects of designing.
4. Position your design strategy within the broader context using models of innovation and transition.

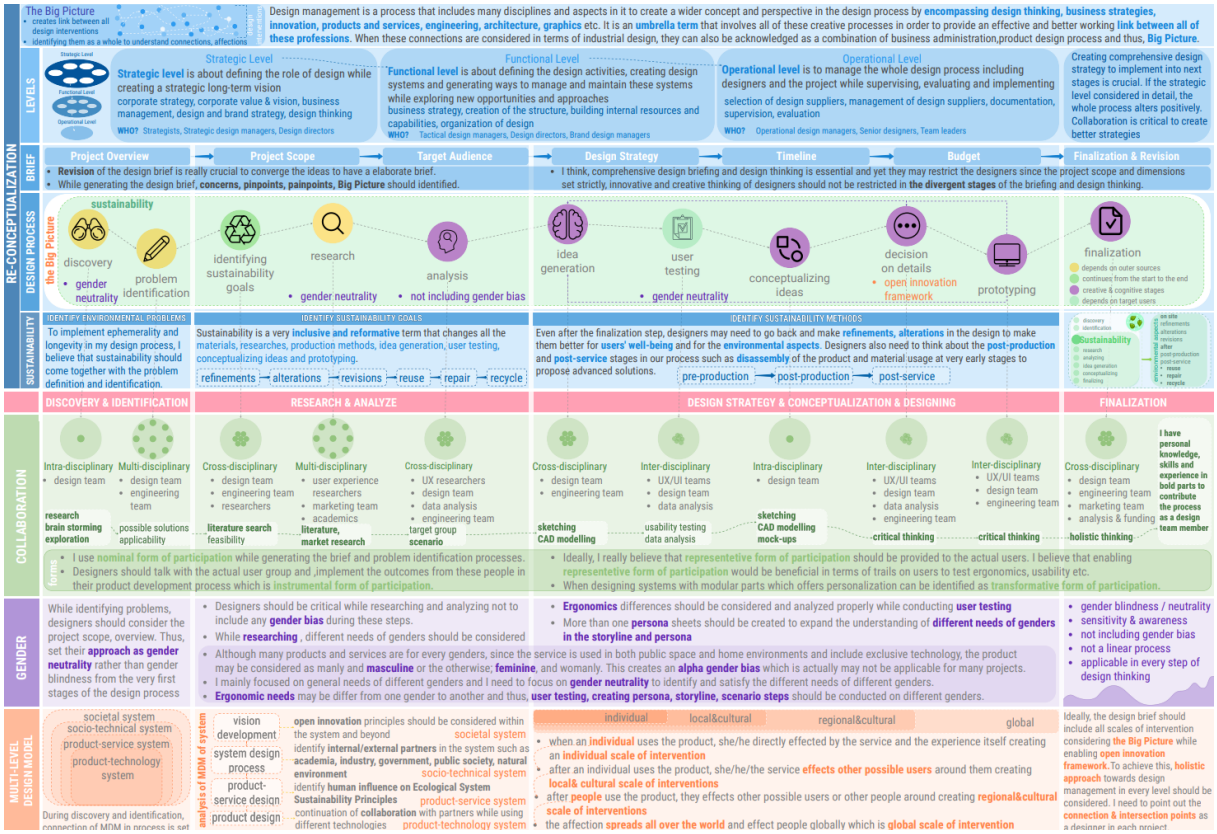

Figure 1. An example of the final assessment task of the design management module at METU

These ILOs were worded specifically to build upon the more generally recognised aspects of design management, through an exploration of more critical perspectives on complex, wicked concerns that the design discipline has been tackling. The module needed to convey not only the rationale, importance and historical evolution of the design management field, but also showcase the challenges, opportunities and renewed critical role of design management for more complex issues and aspects in robust and grounded ways. The module content was structured accordingly and consisted of three parts:

1. **Design Management Basics:** This part covers the foundational principles of design management, providing students with a solid understanding of the field. It includes the historical emergence and evolution of the field, layers of design management in organisations (i.e. strategic, functional, and operational), design thinking and its various interpretations, design briefs and their roles, and formalised design processes.
2. **Emerging Concerns for Design Management:** This part includes specific lectures and activities dedicated to specific contemporary issues. The 'design for environmental sustainability' lecture focuses on the complexity of stakeholders for sustainability [17], the multitude of design for

sustainability approaches and formalised sustainable design tools and approaches. The 'collaboration & new roles of designers' lecture focuses on different framings of collaboration in terms of disciplinarity [18], expert–non-expert collaborations, levels of involvement, blurred boundaries between various collaborators [7] and the changing roles of designers [19]. The 'gendered aspects of designing' lecture focuses on key themes for equality, justice and empowerment, introduces the veiled history of women designers [20], and then delves deeper into the gendered division of labour in design teams [21], gender-blind and biased design research [22], and ways design outcomes embody and reproduce gendered norms and stereotypes [23]. These concerns are discussed in relation to design strategy, design processes, and design briefs.

3. **The 'Big Picture':** This part introduces models of innovation and transitions, helping students understand the broader context of design management. These include triple, quadruple, and quintuple helices of innovation [24], future studies methods and backcasting [25], and the multi-level design model [26]. Such framings illustrate various ways of deploying systems thinking for students to critically question the role of design in larger societal changes.

This module was delivered at two universities, for two years at each university (four years in total, from 2020-21 to 2023-24), namely, Department of Industrial Design, Faculty of Architecture, Middle East Technical University (METU), Turkey, as a final year module with 71 and 78 students, and School of Design, Institute for the Contemporary Arts, Lancaster University (LU), United Kingdom, as a second-year module with 40 and 30 students. In both, the module consisted of ten structured, 3-hour teaching sessions. The teaching and learning activities (TLAs) were designed as workshops where students reflect on each lecture topic and content through additional resources and desk research, and build their personal approach to design management. TLAs were meant to build towards the final assessment task (AT) for which each student was expected to present their personal approach to design management for the sub-discipline of design or the sector of their choice. At METU, the students were all from industrial design with high-level of visualisation skills and their final AT involved the visualisation of their approaches to design management (see Figure 1), whereas at LU, the students were a mix of design, marketing, advertising, and business administration with varying visualisation skills; hence, the final AT was a term paper presenting their approaches.

The module was continuously assessed according to the quality and content of ATs, student evaluations, educator's reflections, and input from other educators and researchers. Over four years, the module convenor (first author) continuously developed the module content according to the student evaluation and feedback gathered through in-class discussions, getting feedback and reflection specifically on fostering necessary sociological and political imaginations for identifying exclusionary and unjust aspects of designing and formulating inclusive forms of collaboration from the second author, which also revealed implications for student learning on design management.

4 IMPACT ON STUDENT LEARNING

At METU, the module focused on depicting students' unique design processes over two years. This approach allowed students to apply design management principles for devising projects and fostering a deeper yet nuanced and reflexive understanding of the subject. Students developed the capacity to embed sustainability and circular economy principles throughout the design process, manage collaborations in terms of disciplinarity and user/non-expert participation, and apply a gender lens in line with their gendered positionality in the field, the reproduction of inequalities and exclusion through design processes and outcomes, and policy-level concerns. At LU, the module took an inquiry-based approach, encouraging students to investigate and address real-world design management challenges in different design sub-disciplines according to their career aspirations, including but not limited to product design, fashion design, UX design, service design, AR/VR design and branding & marketing. Over four years, students explored different approaches to brief making, developed personal design processes based on existing models, and identified roles in levels of design application, showing valuable insights into strategies used by different organisations.

In exploring the implications of design management for environmental sustainability, students identified critical pathways to influence strategic-level decisions and vision development, resulting in a more comprehensive and robust organisational approach to design for sustainability. Integrating sustainability considerations became a central aspect of design briefs, ensuring that a robust set of considerations was addressed at the product, service, and systems levels. Most students were able to identify tools and techniques appropriate for different stages of their unique design processes and their implications at

different levels of design application. This approach not only guided the development of sustainable design solutions but also fostered a deeper understanding of the interconnectedness of various design elements and their impact on environmental sustainability.

The student work was varied in terms of managing collaboration and identifying new roles of designers. Students in pursuit of in-house careers in larger corporations focused more on disciplinary modes of collaboration throughout the design processes, with a few identifying the nominal-level user involvement in ideation and testing. On a more important note, these students mostly differentiated the stages in terms of disciplinarity (i.e., multi, cross, inter) collaboration. Most notably, design research stages were generally identified as a multi-disciplinary collaborative effort with specific forms of research conducted by different teams in parallel, with their results later converged and analysed in cross-disciplinary teams, imparting their disciplinary perspectives. In contrast, students in pursuit of design consultant careers or design entrepreneurship prioritised early-stage active user involvement for ideation and framing of problems, recognising the value of in-depth user insights in shaping innovative and relevant design outcomes from the outset. These students were also more interested in representative and transformative modes of collaboration, with a specific emphasis on active non-expert user and prosumer/maker involvement, fostering a dynamic environment where ideas can be nurtured and refined through a network of specialised partners and non-experts.

In both universities, student awareness of unjust design processes increased, albeit with varying levels of critical thinking. Many students identified unjust design task allocation based on gender and intersectionality throughout the design process, yet adopted normative and somewhat vague approaches in addressing gender stereotyping. For students in pursuit of in-house careers, strategic and functional-level interventions on unbiased task allocation became a prominent topic. In terms of design research and analysis, one crucial aspect was the recognition of the need to collaborate with experts on gender equality to reveal and address data bias and gender blindness. In order to collect data on previously unforeseen impacts of design outcomes exacerbating existing unjust and unequal practices, some students suggested longer-term observation and evaluation of design outcomes as further steps. This unexpected result shows that students acknowledge the importance of continuous and long-term assessment and improvement even after the design and product development process is finalised.

In exploring the implications for systems thinking within design management, most students positioned organisations, design processes, and outcomes within the broader context of societal change. By emphasising the interconnectedness of various design elements and their impact on society, the module encouraged students to adopt a holistic approach to setting and adapting design strategy. This perspective influenced the selection of potential design strategies for vision setting and revealed students' unique approaches as individual designers in this pursuit. Nearly all students could identify potential roles their practices can take in societal change and how this is reflected in design processes, and some of them even identified potential roles of design in driving meaningful societal transformation.

5 CONCLUSION

To connect critical perspectives in design literature on environmental sustainability, inclusive collaboration, and empowering practices, the undergraduate module introduced in this paper integrated these viewpoints from a design management lens. The module comprised three parts: design management basics, newly emerging design management concerns, and the broader context. The module was implemented, continuously evaluated and regularly updated across two departments with differing design education approaches over four years. This refreshed curriculum effectively enhanced student learning on integrating these themes from a design management stance at all design levels, particularly in addressing complex societal issues through innovative and sustainable design as designers or entrepreneurs. Students addressed the new concerns differently, influenced by their career aspirations. Those pursuing in-house roles focused on organisational strategic concerns and their connection to design practices, identifying novel tools and methods throughout the design process. In contrast, students targeting entrepreneurship or consultancy emphasised collaborative and inclusive processes throughout, highlighting their value to external stakeholders. All students displayed a nuanced grasp of environmental sustainability and inclusive collaborations and recognised unjust and disempowering aspects of design. They demonstrated the ability to position design strategies within wider societal contexts, highlighting design's role in driving societal transformation. This module exemplifies the need to integrate critical perspectives into design management education to cultivate designers prepared to tackle contemporary challenges.

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