

Constructive Disruption: a proposal for a planet-centred curriculum to enable circular systems thinking in fashion and textiles education.

Sabine Lettmann, Zoë Hillyard, Beth White
Institute of Jewellery, Fashion and Textiles, Birmingham City University.

Abstract

Traditional fashion and textiles education is predominantly based on processes that inform a linear fashion industry which contributes to global, significant environmental and societal challenges. Thus, universities share governments' accountability for sustaining a flawed system. As a response, this study proposes a planet-centred and community focused fashion and textile curriculum equipping students with competencies required for cultural change that enables a prosperous future for all. This curriculum proposal explores how an environment at Birmingham City University to observe nature (Growth Garden) and to explore materials (MAT_er.LAB) can be a place where artistic, scientific and technical perspectives thrive through collaborative and reflective practice. As a STEAM approach it embeds Art within the STEM agenda through a four layered pedagogical structure that feeds into a curriculum framework mimicking the seasonal calendar to allow several entry points and lifelong learning. Designed to form an inclusive and equal learning system for 'constructive disruption', strategies aim to dismantle the existing knowledge-accruing focused learning structures that currently prevail. Seeking change beyond education, this proposal also questions dominating point-based application systems as irrelevant for cultural change. By embedding community driven assessment forms, it shifts evaluation from grades to impact providing real change that serves nature and society.

Keywords: Fashion Education, Circular Fashion Design, STEAM Education, Circular Systems Thinking, Curriculum Design, Biomimicry.

Introduction

Although the subject of sustainability has become a focal point of societies across the world, the necessity to be mindful of using resources is not new. In the eighteenth century, the German Inspector General of Mines developed the term *Nachhaltigkeit* (sustainability) in response to the wasteful and exploitative approach to sacrificing forests for silver mining. He demanded a more systematic cutting down, calling for periods of regeneration (Grober 2010: 80). Only centuries later, in 2015, the United Nations pledged the 17 Sustainable Development Goals proposing 169 targets resulting from the determination to 'shift the world on to a sustainable and resilient path' leaving no one behind (UN 2015: 1). Recognising the destructive nature of many of the practices involved in the clothing industry, momentum for a global conversation regarding the future of fashion has been building over decades although a formal definition of the term sustainability is still lacking (Chatzistamoulou & Koundouri 2018: 5).

Feeding into the linear fashion system, traditional design education has been complicit in maintaining this unsustainable structure. 'A great deal of knowledge the university delivers, is based on the needs of the world that was, and so is de facto 'education of disengagement, or in error' (Fry 2020: 2). Many aspects of the curricula, pedagogies,

assessment formats, and assessment criteria, are shaped by audits based on employability, and as such fuel the established economic growth system that is 'purportedly inclusive and socially cohesive' (Campbell 2021). The measures of student success are quantified by employment destination surveys focusing on commercial criteria and presented in competitive league tables (Biesta 2010: 10) whilst the shock of the COVID-19 pandemic pushed universities into a 'state of paralysis' (Hil et al. 2022: 27). Additionally, there is demand for universities to reflect on their purpose within the context of ecological survival (Bushell et al. 2017; Molthan-Hill et al. 2019).

There is unease within the student population too. The pandemic has accelerated the level of store closures in European countries removed from the physical landscape of brands that would otherwise have been a career aspiration. With the transition to a circular economy as proposed by the Ellen MacArthur Foundation (2017: 22) jobs are projected to change requiring skilling and reskilling of the workforce and integrating circularity into education (Circle Economy 2020: 5). Moreover, the majority of fashion businesses that influence global impact such as the climate crisis on a significant scale are located in the Global North. These countries and their education systems face responsibility to educate for changing the fashion paradigm and thus, drastically must change how design education is shaped where traditional education is still in place. Only recently at the United Nations Conference of the Parties, COP27, signatories have agreed on a 'loss and damage fund' (United Nations Climate Change 2022) to support vulnerable countries in fighting the impact of climate change. This serves to underline the role educational systems play as part of wider national commitments in relation to their climate change accountability. Consequently, what can reconfiguring accountability from an educational perspective as part of the urgent political agenda (Hil et al. 2022: 29) look like?

Recognising the tremendous shift required to equip students in a post-pandemic world with the skills and competencies for autonomous learning that fosters a new regenerative fashion paradigm this research aims to propose a radical curriculum redesign. It considers the fashion and textile course context of Birmingham City University (hereafter BCU) with subsequent impact on current structural environments such as the National Student Survey (NSS), the Universities and Colleges Admissions Service (UCAS), grade systems etc which are seen as too restrictive for fundamental change. Whilst smaller changes of fashion and textiles curricula could be aligned with established higher education structures, the demand for a seismic shift from an environmental and social viewpoint is too high for adjusting only (Hil et al. 2022: 28). Hence, the proposal aims to provide fundamental innovative change starting from inside one educational institution with the potential to initiate a nationwide move towards providing multiple curricula for the future.

This research draws from the development of two spaces initially planned as extracurricular practice incorporating interaction opportunities at the School of Fashion and Textiles. Firstly MAT_er.LAB, a material laboratory launched in 2019 acting as a facilitator introducing the relevance of working with nature as the system that human existence is rooted in. Secondly, it embeds a sustainable Growth Garden which

provides space for the creative problem-solving of circular design challenges through the tending of a living, growing, and evolving plot of land through seasonal change. Aligning with social constructivist pedagogy (Bruffee 1985: 131), where the social interaction of shared activity nurtures changing mindsets in small incremental steps, the Growth Garden aims to provide an environment that allows individuals to empower each other through social interaction investigating the roots of problems in a deeper way. Not dissimilar to the cultural movements of the 1960's (Mueller 2004: 79) it questions the wider meritocratic order and envisions this project as part of a wider movement of participatory democracy upholding the communal over the individual.

This proposal seeks to explore how the concept of both spaces and the approaches they inspire be used to shape a new educational framework and pedagogical approach appropriate for BCU's School of Fashion and Textiles. Thus, what structure would support learners to become confident and curious to collaborate across courses, schools and faculties, and equip them to become changemakers and influencers within their profession lives? What system would better support the whole ecosystem of education – learners, teachers and the communities they exist within? In developing this exemplary curriculum, the main research objectives are defined as:

- 1) to reflect and react to societal shifts and the changing values and needs of citizens;
- 2) to support individuals' life-long learning through gaining circular competencies
- 3) to contribute to wider societal benefits and define new value metrics.

Literature Review

The status quo

Modular structures of current curricula provide a segmented linear progression, with students 'accruing' knowledge as they move through a programme. Attainment of credits and the chasing of marks is based on ideas of knowledge acquisition (Paraskeva et al. 2020: 3), establishing competitive relationships rather than sharing and nurturing collective endeavour. In Bruffee's social constructionist pedagogy, knowledge, he states 'is an artifact created by a community of knowledgeable peers, constituted by the language of that community and that learning is a social and not individual process' (1985: 231) whilst collaborative discussion reflects the interconnectedness of natural ecosystems. Feeding into the circular economy's lens for looking at problems in an interdisciplinary way (Circle Economy 2020: 5), collaboration provides a useful template for deep learning. Deep learning (Biggs & Tang 2007: 27) ensures students' progress from a strategic mode of learning, acquiring information to pass an assessment, to a fundamentally self-directed and inspired attitude to learn, interpret and apply knowledge. This relates to 'conscientization', or critical consciousness, proposed by Freire (2000) in the 1960s. A term recognising the stage of learning by which individuals shake off that which has held them back and fully embrace their agency involving counter-narratives to a capitalist hegemony that previously have been suppressed (Sultana 2019) with significant relevance for BCU's diverse student cohort.

Whilst collaborative experiences feature within fashion programmes, the design challenges set remain goal-driven, seeking to populate niches within the current

market system (see Fletcher & Grose 2012: 155). Moreover, the circular economy aspect is currently underrepresented in traditional curricula (Androutsos & Brinia 2020: 119) with academia largely schooling for one profession and task divisions (Circle Economy 2020: 10). Currently, aiming to reflect fashion industry practices students are taught in scaffolded processes throughout the degree to build skills (Murzyn-Kupisz & Hołuj 2021; Küpers et al. 2014). Fashion and textiles students traditionally engage with diverse research to collect and synthesise imagery and information (Mbonu 2014: 17), investigating industry trends and colours followed by a conceptualised application (Sorger & Udale 2017) of creative ideas to their design brief. However, considering a changing industry, design education evolves into an 'essential tool for creating an ethical fashion system' (Onur 2020) as part of an overall transition in which the designer becomes the communicator, facilitator and educator of new processes (Fletcher & Grose 2012: 156). Subsequently, in a post-pandemic world, Fry (2020: 25) believes that the current university model is failing to sufficiently respond to global circumstances, largely delivering 'redundant functional knowledge and practices' in line with Hil et al. (2022: 29) who call for 'reimagining education as a site of transformation' to initiate engagement and regeneration.

One of the transformative changes in design education was expanding a more traditional focus on STEM (Science, Technology, Education and Maths) subjects with a creative discipline (Arts) to form STEAM, a term which is flexibly used depending on the disciplines involved (Carter et al. 2021). Seen as an opportunity to strengthen the economy (Catterall 2017; Girão et al. 2018) one central argument is the initiation of creativity and empathy (Catterall 2017; Guyotte et al. 2015). Historically, in the 1920s and 1930s, the German Bauhaus School aimed at unifying arts with technology through offering workshops as 'laboratories for industry' (Meyer & Norman 2022). The emergence of STEAM in the USA in the 1990s formulated as a result from funding cuts in the arts sector, requiring the showcase of art-based inquiry within STEM (Catterall 2017). This societal development is reflected by recent funding cuts by the UK government for higher education art subjects including fashion and textiles, a decision seen as detrimental for English universities (Goodhall 2021). Hence, alongside the changes in the fashion industry depending on new innovative approaches and processes, there is a further need to reimagine fashion and textiles education, and for it to be acknowledged as playing an important role within a new economic model that needs to evolve.

A very successful example of redesigning higher education has taken place at the Rhode Island School of Design which in the past years pushed STEAM education by placing an emphasis on cross disciplinary learning to better prepare students to compete in the 21st century (Rhode Island School of Design n.d.). The school's Nature lab's hands on approach to learning provides an environment where students can investigate ethical and sustainable modes of making informed by natural systems. Students are encouraged regardless of experience or level to use resources to better understand and articulate the role we play as humans in the ecosystem (Nature Lab n.d.).

With a similar intension, in 2018 BCU launched STEAMhouse, seeking to create a maker-space hub to bridge creative departments and faculties with industry and entrepreneurial businesses. Since 2022 located in its own building, it strives for the realisation of STEM education via STEAM, which Radziwill et al. (2015) believe lends itself to interactive and participatory dialogic art feeding into the cross disciplinary thinking with the potential to 'imagine a different world' (Cunningham 2014) through civic engagement. Paving the way to educate students for activities within STEAMhouse and beyond, MAT_er.LAB provides the initial exploration of STEAM practices throughout degree level study.

Curriculum for the Future

Envisioning the future of education, Fry proposes a fourth incarnation of a university, termed *Urmadic*, to capture a universal, place-less yet embedded approach: the focus is on 'event-based learning' and problem-based projects that evolve through situated collaborative discussion and focus on 'thinking and acting in time', ideas being voiced by Victor Papanek (1971: 302) in his seminal work 'Design for the Real World' back in the 1970s. Fry argues, what is currently mostly being taught fails to adequately engage with the problems of the Anthropocene (2020: 46), also seeing an epistemological disjuncture's between the vocational knowledge being imparted, and the changing circumstances of industries, professions, and work, especially from the impact of technologies and the compound crisis of a rapidly changing world (2020: 19). This view is more radically expressed by Harney & Moten (2004: 28) who state that the pursuit of knowledge is 'a means toward eradication of oppression in all of its forms.'

Fadel & Groff (2018: 274) argue that the curriculum of the future needs to be adaptive, balanced and flexible whilst de Oliveira Andreotti et al. (2015) find that reimagining the university can take place 'beyond reform' enabling regeneration beyond radical change. Within current fashion and textile programmes, the integration of live briefs and competitions shows a certain amount of adaptability, ensuring students engage with real-life needs (Androutsos & Brinia 2020: 19) supporting co-learning and knowledge exchange between education and industry (FashionSEEDS 2019: 56). The authors follow FashionSEEDS direction that fashion design for sustainability should seek to 'change fashion from its root, to shift its focus from contribution to the economy, to a wider focus on a contribution to society, nature, culture and economy.' (2019: 36) This aligns with Meyer & Norman (2020) who observe that the complexity of design challenges mean that designers' responsibilities are expanding beyond the technical. Alongside, learning needs to be delivery focused on ethics, fairness, sustainability and the preservation of the environment. In terms of the 'balance' that Fadel & Groff (2018: 274) advocate for, the political and strategic forces that exert influence on the curriculum remains significant, 'pushing and pulling' with a heavy emphasis on STEM subjects at the cost of art and design (Goodhall 2021).

In their recent report, FashionSEEDS identified 55% of their industry sample group defined 'staff contributions to sustainability' as a hiring or promotion criterion (2019: 57) highlighting the demand for fashion education for sustainability. Without the latter, at the higher level, this means institutions are not responding to the need to develop the kinds of knowledge that the imperatives of today require. Neither is it driving critical debate, nor producing a timely and dynamic critical culture necessary for employability opportunities in the sector of sustainability (Androutsos & Brinia 2020: 119). It is also

lacking the 'planet before industry' approach, as demanded by Fletcher & Tham (2019: 23).

Competencies Enabling to Design (for) the Future

According to Fry (2009: 4), designers need to understand the importance of design to enable a future for humanity by design. Therefore, fostering students' contribution to a circular fashion industry, they must attain certain competencies which go beyond traditional, linear skills. Key competencies are defined by Sumter et al. (2021) as ranging from circular systems thinking, design for recovery, design for multiple use cycles, circular business propositions, user engagement, circular materials and manufacturing, impact assessment, circular economy collaboration to circular storytelling. Additionally, 'art-based practices for cultivating and promoting creativity and a co-creative mindset for designing for human-centred solutions' are required (Androutsos & Brinia 2020: 119; FashionSEEDS 2019: 67).

Successfully shifting mindsets from one system (linear economy) to another (circular economy) requires behavioural and cultural change. Following Quinn (1992: 49), this can't be achieved through a simple replacement of the existing. They state,

'You must change people's minds. And you can't just root out a harmful complex of ideas and leave a void behind; you have to give people something that is as meaningful as what they've lost.'

By adapting circular thinking, cultures across the world are assumed to undergo a cultural evolution, from redefining perceptions of nature on a personal level, to adjusting laws on an institutional level as Salminen (2018: 45) argues. Subsequently, this cultural evolution will potentially inform a new awareness, positively shaping the 'society of the future' that focuses on human and planetary well-being reinforced through a different definition and measure of the quality of life and education, for example (Salminen 2018: 34). The potential to proactively evolve as a society is mainly driven by the human ability to learn and innovate leading to cultural transmission (Wilson 1994).

In summary, it is argued

- The curriculum proposal needs to provide adaptive, flexible and balanced teaching methods to disrupt the status quo.
- With learning being a substantial element of societal evolution, a visionary STEAM curriculum could instigate this evolutionary process with nature and well-being at the heart and recognise the importance of engaging in the process of intellectual negotiation and collective decision making.
- Competencies need to equip students with the mindset to reflect, critically analyse and re-think existing narratives to establish new hybrid employability skills drawing from art and science.
- The curriculum needs to reflect the changing nature of employment patterns and, empowered through the lens of circular systems thinking, support students

in collaboratively building a visionary fashion industry shaping resilient and equitable societies.

Methodology

This research draws from the context of BCU offering a range of established fashion and textiles courses. Drawing from the development of MAT_er.LAB and the Growth Garden at the School of Fashion and Textiles between 2019 and 2021, the pedagogical framework aims to offer a new planet-centred STEAM curriculum for the existing courses, feeding into a strategic Institute five-year plan.

To understand the crossovers between science and art disciplines within personal approaches to knowledge creation that could potentially feed into a STEAM curriculum proposal, in-depth interviews were conducted with an environmental engineer (Scientist), an artist (Artist) and a textiles technician (Technician). Interviewees were selected because of their specific professional engagement with nature as a source, whether in science, art or textiles and thus provided a common interest ground, yet each with a succinct discipline focus. The scientist and the technician were based at BCU at the Faculty of Computing and Engineering and the Faculty of Art, Design and Media, respectively, whilst the artist was local to Birmingham and known for their work intertwining nature and art.

The interviews form an applied phenomenography approach with roots in empirical research in education during the 1970s, seeking to identify individual learning experiences but drawing from a 'description of things as they appear to us' (Adams & von Manen 2008: 614). They were semi-structured and recorded with a duration of approximately one hour, allowing for an in-depth exploration (Burke & Jimenez Soffa, 2018) of participants' experience of working with nature. Interviewees were asked the same set of fifteen questions investigating their relationship with nature, work approaches and reflective practices, whilst each interview allowed space for individual facets and nuances. Recordings were transcribed and viewpoints were coded to identify themes (Harding & Whitehead 2015) that were evident across the interviews. Thus, the latter information provided the rationale of the pedagogical approach reflecting science and art perspectives informing the main areas outlined in the next sections. However, whilst phenomenography allows the appearance of more complex insights (Adams & von Manen 2008: 614), the sample group represents only a small fraction of experiences made by other scientists, technicians and artists in different contexts.

Proposal

Pedagogical Approach

Alongside aiming to address the research objectives, the proposal's pedagogy is based on the idea of establishing a series of fluid stages to mirror nature's continuous flows, operating at different levels both in the physical and abstract spheres. Design is defined as science in alignment with art:

'We're all scientists, really, it's just some people are scientists and are called scientists, some people are artists who call themselves artists' (Artist).

These science-linked (Fletcher & Tham 2019: 5) fluid stages are represented through the four-layer diagram shown in Figure 1. Layer 1, *Growth Garden*, builds the pedagogical core providing engagement with a micro version of nature in the atrium central to the School of Fashion and Textiles. Raised beds and container planting provide scope for creating different growing environments with crops easily observed from the glass corridors that surround the space.

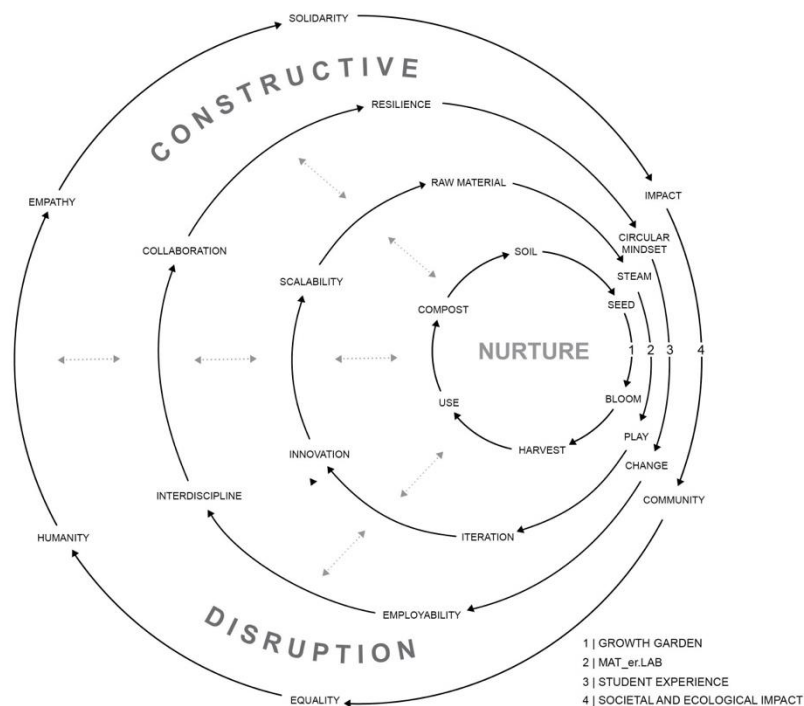


Figure 1: Pedagogical approach *Constructive Disruption*. Diagram by the authors.

Designed to offer a system for 'constructive disruption', students learn from the strategies found in nature such as Cradle to Cradle, a philosophy that has 'nourished a planet of thriving, diverse abundance' (McDonough & Braungart 2009: 9) aligned with Fletcher and Tham's (2019: 23) demand to apply 'earth logic' within the fashion industry. Fry (2020: 24) describes modern man as being 'an animal materially out of control,' and the Artist acknowledged they had 'began to fall out with my own species' to convey the sense of unease about humans' relationship with nature. As a global movement to raise change makers, the Green School (n.d.) acknowledges the innate human instinct to connect with nature as an educational setting. It is designed to work in harmony with the environment introducing the principles of biophilia.

Forced to slow down to nature's pace and by mimicking nature's circular flows, students gain the competency to rethink fashion through circular materials and manufacturing (Sumter et al. 2021). Additionally, students learn to understand that the system behind the growing threat to the planet is human made, requiring a significant

change of activities within design (Fletcher & Tham 2019: 21). Initiating design approaches for multiple use cycles, they mindfully select processes that subsequently tackle societal imbalances. Collective thinkers will be far more able to see themselves as contributing to an adaptive organic entity than before, whilst performing another of the key competencies for circular design: collaboration (Sumter et al. 2021).

The Growth Garden feeds into the second layer, *MAT_er.LAB*, aiming at tackling the disconnection between humans and nature through material experimentation, encouraging an appreciation of nature beyond that of being a consumable resource. *MAT_er.LAB* and the Growth Garden both place value on the importance of hands-on experiences and play, to build relationships with the natural environment. They are spaces that encourage technical, scientific and artistic approaches, with the collaborative nature of activities (Radziwill et al. 2015) promoting pivotal moments of insights. These insights shape the third layer of the pedagogical approach – *Student Experience*.

The Scientist acknowledges that nature-based research can be frustrating and that results ‘might not be what you predicted or what you want’, but valuable in that ‘it’s taught you something else about the process.’ The Artist expresses a similar fascination with the uncertainty involved ‘all I’m really wrestling with is me’ and, ‘if you’re working with nature there are unknown knowns happening all the time and they are thrilling because you don’t know quite what going to happen.’ The Technician highlighted the lack of permanence when working with natural materials which they found unsettling. However, as FashionSEEDs (2019: 36) note that fashion has to change from the root, this proposal includes the call for different research approaches encouraging curiosity and openness for life-long learning.

The collaborations that happen within the Growth Garden run parallel to academic growth and the realisation of personal agency. As with a healthy eco-system, group vitality comes from having diverse inputs of people and perspectives (Dunne & Martin 2006). Collectively, a rich ecosystem of shared experience and responses is generated, creating intellectual biodiversity to draw from, but what is also nurtured is students’ skills for stepping into industry as open-minded agents of change. These experiences inform the last layer, *Societal and Ecological Impact*, that can shift student learning beyond the university environment with the potential to drive local systemic change in line with Bruffee. In his early work, Bruffee (1985: 12,14) saw collaborative learning as part of a wider movement for participatory democracy, shared decision making and non-authoritarian styles of leadership and group life which, according to Cunningham (2014), can inform a different world through civic engagement.

Curriculum framework

The following outlines suggestions for a curriculum deliberately disregarding existing structural and institutional limitations in order to offer a blueprint that revolutionises higher education. Nature’s systems operate without any interruption or pauses; hence, all activities on a micro and macroscopic level are in a constant flow nurturing its future. As a process, ‘nature works perfectly’ (Scientist) and offers opportunities to think about the bigger picture whilst not fulfilling ‘the desire for permanence’ (Technician). The

Artist, furthermore, evaluates nature as a collaboration partner stating, ‘it takes me into the real world.’ This real-world view serves as a format for the overall framework; fostering learning and teaching experiences aligned with the philosophical mindset of a circular economy. Building relevant student competencies to ‘search, find and choose a real-world sustainability issue (Androutsos & Brinia 2020: 120) will gradually drive change. Its objective is to break with norms and create a new earth-relevant society resulting from awareness, mindful behaviour and cultural change.

To achieve this, all interviewees recognise that there needs to be a slowing of pace in order to be able to engage with the rhythms of nature and that this demands patience and a level of acceptance:

‘Slow time is important and to have something actually where you can’t go out and say, “grow faster”, it’s just brilliant, because you can’t do anything about it except just observe and be as helpful as possible’
(Artist).

Accommodating a different pace, the structure outlined below, follows a new form of seasonal circularity. It enables a natural evolvement on personal, professional and academic levels and provides a fluid and flexible framework essential to accommodate societal, technological and demographic shifts, as well as more automated and fluid job markets.

Supporting life-long learning

A cyclic, seasonal structure offers six equal, bimonthly entry points per year, whilst each of the five sections on the annual timeline represents one module. Although the curriculum includes a duration of three years for each degree, students will have the possibility to define minor and major projects to work on by themselves, as well as take time out, but also keep the life-long learning momentum of their studies as examples show in Figure 2:

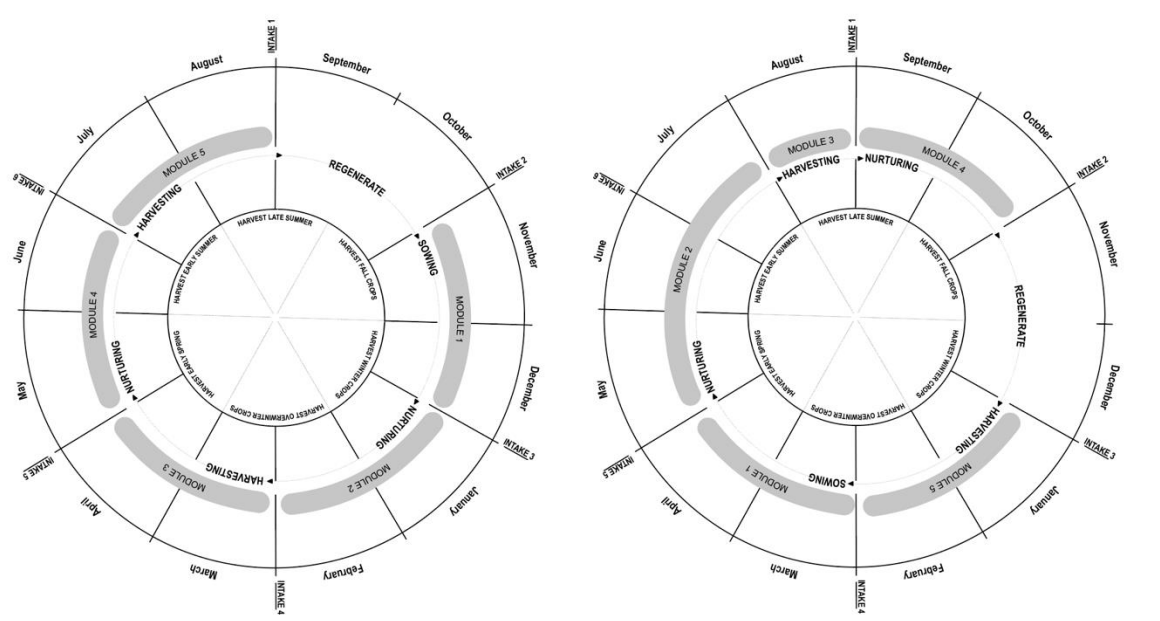


Figure 2: Individual academic calendar. Left example Student A, intake November. Right example Student B, intake March. Diagram by the authors.

This flexibility creates the basis for reflective practice, a process defined as continuous and dynamic, requiring time to 'absorb, apply and think about the different ways that reflection is incorporated in everyday action' (Candy 2020: 39). It is assumed that being able to step back and reflect without the pressure to directly continue education can foster improving ideas, as Candy (2020: 49) suggests. The Artist supports this, stating that their work never finishes as 'it's all the same project' allowing students to switch perspectives between 'the participant/the observer' (Artist). Within this structure, a workflow that ends with one module can become the beginning of a new module. Hence, whilst flexible module duration opportunities address different student needs, they also support different life stages integrating lifelong learning and future literacy as a satellite system of an overall degree. Furthermore, it is assumed that flexible coordination of education phases will lead towards better completion rates, higher self-esteem and less stigma when delaying the degree. According to a study published by Copenhagen Institute for Future Studies (Fuglsang Ostergaard 2019: 7), education models need to reflect the structural transformations on the horizon:

'We must come to terms with the fact that we need to continually learn and update our skills in order to stay relevant, since the value of a particular skillset quickly declines as new knowledge is produced and new tools are developed.'

With the flexibility to shape one's own degree structure and module lengths, the framework embeds design thinking processes as an approach to ideate, review, iterate and adjust (Dunne & Martin 2006) aiming at enhancing a higher outcome quality through short and long timeframes of inquiry. Additionally, it provides students with the *assertion of rights* to study in a literal sense, being able to define what fits one best, breaking down the hierarchies of traditional higher education.

Within these stages, ideation and play increase the acceptance of the unknown. It creates a deeper engagement and understanding (Dieleman & Huisigh 2006) of both design and science: 'scientists, sometimes, are like artists because they encourage play and that's important' (Artist). Play requires individuals to be open to change as a normal part of practice (Candy 2020: 50). The Technician describes their work as 'accidental, and just trying things out' which is confirmed by the Scientist as a process involving 'a lot of trial and error.' Not cutting these iterative stages off, but on the contrary, allowing these reflective cycles to move from *sowing* (ideas), *nurturing* (processes) to *harvesting* (solutions) is seen as important to drive cultural change through a flexible curriculum structure. Furthermore, the impact of these fluid stages will foster peer group development, knowledge exchange and cross-pollination initiating a circular mindset through collaboration and 'the fascination with how things grow and evolve and cycle and change' (Artist).

Reflecting societal shifts, changing values and needs

Reflecting the seismic shifts in the values and needs of society today, the Artist advocates the adoption of a new kind of ecosystem that is based on metrics associated with reciprocity. Developing diverse, external partnerships is core to the

curriculum and enables working with, in and for local communities as part of a human-centred design approach (Androutsos & Brinia 2020: 120), disconnecting learning from existing metrics and linear economic growth. Empowered through these networks, students will collectively learn through 'candid conversations outside of the research' supporting the 'building of relationships' (Scientist). Bridging academia with society results in real-world challenges based on people's needs and the importance of reacting to the bigger picture of human life on earth, building knowledge of how solutions are 'going to be applied in the real world' (Scientist).

For all interviewees, key individuals have proved to be pivotal in their learning journey at critical stages, 'I remember having a textbook that my mum gave me... all around the natural environment, and it just kind of inspired me' (Scientist). The Technician recalls starting a personal 'natural history museum' whilst at school, that was in effect a glorified nature desk. 'We had a particular teacher that was very into nature and encouraged us to do that sort of thing. And it sorts of snowballed from that.' Building on these vital moments, within the new framework applicants will be asked to share their connection with and philosophical reflections on nature instead of applying with a skills-based artistic portfolio only. Moving on from the traditional focus on educating for one profession, this represents an approach based on the 'idea that the learning process equips the individual for the "world," that is, and everything is appropriate and enjoyed by learning' (Fry 2020: 44). Values, ambition and expectation complement existing design-related skills and offer the opportunity to select a diverse group of progressive design thinkers embarking on an unknown collaborative journey. Life skills are nurtured, driven by collectively shared and culturally embedded experience.

Curiosity is placed at the heart of each research approach that the Scientist believes has the capacity to present 'many more questions and interesting findings' believing you would be 'remiss not to explore those a little bit further.' The Artist also recognises the need to 'trust that you'll come up with something through this cycle of phases,' an approach closely linked to design thinking. The Growth Garden's central position within the building means it becomes a hub around which learning spaces sit. Casual observations ignite conversation and individuals begin to engage within a part of the eco-system where they can most contribute – project management, growing seeds, weeding, harvesting, building composting facilities. Watching constructive disruption in action becomes a point of discussion influencing mindsets and raising awareness for the impact assessment of materials (Sumter et al. 2021). Additionally, the Growth Garden nurtures and promotes ideas of self-sufficiency and localism, 'if everyone's self-sufficient to some degree, they're less dependent on industry' (Technician). Each module will start with Growth Garden experience informing the further progression of design and make. Certainly, reorientating to living within the limits of nature requires fundamental change, of perspective, priorities as well as processes.

MAT_er.LAB engagement fosters a deeper understanding of material processes through which students can achieve sustainable practice and better contribute to building a new economic system. Biesta (2010: 75) defines the purpose of higher education as qualification, socialisation and subjectification, a viewpoint complemented by students who 'think of education as also a time to open and expose

oneself to different realities' (Trinidad et al. 2021). Working with MAT_er.LAB throughout different module stages exposes students to unfamiliar processes such as utilising waste streams leading to renewed material perceptions for fashion and textile design application. The Technician acknowledges the fact that natural dyes 'can be transient, bothers me.' Mindsets will change, crossing between creative problem-solving circular challenges and the close nurturing of a local ecosystem. Recognition that 'if we all did lots of little things, then each of those things would have a different impact' (Technician), will contribute to change on a larger scale through the multiplication of positive outcomes.

A methodical approach to the observation and reflective storytelling of the systems at play within nature is seen in the way interviewees engage with it, valuing nature as a constant source of wonder. 'It doesn't matter how far you zoom in, there's always another layer of something to see' and that is 'just the kind of infiniteness of it' (Technician) and for the Artist 'I find it perplexing and wonderful.' Although all have different ways to record their work, their mutual understanding of utilising writing is to reflect on action (Schön 1991: 26), an activity enhancing the mindset shift required for analytical and critical practice. Whilst the Artist says, 'I found writing and building notes is my way of doing sketches, that just helped me focus' the Scientist highlights 'I actually enjoyed the writing process; I enjoyed the creativity of telling the story.' Working with more delicate materials, the Technician finds 'I have to write down everything I do.' Alongside ongoing iteration where ideas evolve through their exchange and testing, decision making is likely to become driven by nature-orientated considerations. Recording explorations to track changes as a means of understanding becomes the essence of practised storytelling. Sumter et al. (2021) do not only see the manifold phases within circular practice as a key competency to design for a circular economy but, with similar importance, their dissemination to peers and communities alike.

Contribution to wider societal benefits

Whilst assignment tasks address learning outcomes such as collaboration and social as well as environmental impact, a further focus lies on skill improvement for circular economy participation. According to Circle Economy (2020: 7), there will be different job types across the manufacturing and creative industries comprising core ones ensuring closed material cycles, ones that enable acceleration and indirect ones providing services. Shaping assessments in consideration of different methods, wider perspectives as well as embracing individual student needs will inform relevant competencies that connect communities and students engaging users with circular design (Sumter et al. 2021).

Replacing traditional grades with impact-oriented assessment criteria, module outcomes will automatically redirect the current system that slows down societal change by promoting individual performance instead. Stakeholders involved in assessing the students' submission impact on communities' real-life problems, increase the level of insightful and innovative learning, with the results 'addressing the socio-cultural and political challenges and opportunities created by the global problems of enviro-climatic change' (Fry 2020: 6; see Androutsos & Brinia 2020: 19). Therefore, submissions need to consider the 'long term sustainability of what we do

and the economic viability of what we do - otherwise, it never moves out of the lab' (Scientist). This is important if it is to inform the upscaling of experimental stages through circular business propositions (Sumter et al. 2021).

Deeper understanding built through open module creation will additionally impact on educators and supporting staff. Flexible teaching structures establish individual guidance as experienced by the Artist who explains 'staff were really brilliant with me; they gave me my own studio room and they would visit and see the work twice a year.' Whilst individual student guidance seems to leave less room for preparation and delivery, the curriculum re-organisation offers opportunities to increase collaborative practice and peer-learning partly replacing contact time with qualitative group experiences across year groups and disciplines.

Connecting course teams with communities enriches the academic discourse and ensures content remains visionary, purposefully addressing the real world through educating the leaders of the future. Moreover, different entry points will flatten modules' peak times when assessment pressure and administrative workload impact staff well-being, also positively impacting wider household dynamics. Staggering taking annual leave due to balanced prime points in the year increases wider societal benefits, currently without consideration in academic planning.

Conclusion

This research aimed at proposing a radically new, non-conformist curriculum based around the three foci of 1) to reflect and react to societal shifts and the changing values and needs of citizens, 2) to support individuals' life-long learning through gaining circular competencies whilst 3) contributing to wider societal benefits to define new value metrics. Whilst this proposal cannot be seen as a gentle transition into new waters, it is a reimagined form of higher education beyond the existing realm as suggested by scholars such as Hil et al. (2022: 29) or Fry (2020: 46), it connects theories linking real world challenges (Papanek (1971: 302; Androutsos & Brinia 2020: 19) with Freire's (2000) engagement to educate against oppression through an emphasis on applying counter narratives (Sultana 2019).

Not only are governments accountable for their contribution to the climate crisis as formally acknowledged by the United Nations 'loss and damage fund' (United Nations Climate Change 2022), but universities also play a major role in sustaining prevailing linear system structures. Teaching content often refers to past needs resulting in 'education of disengagement' (Fry 2020: 32). It focuses on the idea of knowledge acquisition (Paraskeva et al. 2020: 23) rather than sharing, and competition rather than collective learning, perpetuating the human-made system's failures rather than applying a 'planet first' approach (Fletcher & Tham 2019: 23). As such, current education fails to respond to global circumstances (Fry 2020: 25) largely schooling for one profession and task divisions (Circle Economy 2020: 10). In this context, STEAM education provides a science and art-based cross disciplinary education foundation with the potential to contribute to a cultural evolution (Salminen 2018: 45), subsequently shaping the 'society of the future' focusing on human and planetary well-

being (Salminen 2018: 34). This can only be achieved through behavioural and cultural change and not through simply adjusting the existing (Quinn 1992: 249).

Bridging art and science, this proposal engages students in self-defined minor and major projects supporting them to take breaks whilst keeping the momentum of their studies, as well as enabling lifelong learning. Aligned with design thinking, outcomes will thrive from having diverse inputs (Dunne & Martin 2006) stemming from collaborative experience generating intellectual diversity. Providing a micro-climate for nurturing confidence in a new generation of thinkers, students will be able to grasp the wider consequences of their decision making. This argument for STEAM education needs to be won for a truly inclusive and radical curriculum to be adopted as it represents a deep realignment of the role of design and nature, placing it within the parameters of a healthy natural and equitable ecosystem. Thus, mimicking the seasonal calendar as a new academic structure supports flexibility, adaptation and real-life sustainability challenges, placing nature and science as its core to impact student experience and through this local communities.

The proposal impacts not only on application types, module development and delivery but also on assessment criteria and grades. Hence, it envisions a seismic shift from dependencies on internal and external structures that hinder the development of radically different higher education towards a societal relevant provision serving 'planetary before industry' (Fletcher & Tham 2019: 23). This also entails the current infrastructure universities are tied by, such as the nationwide assessment of applicant suitability through a system that predominantly focuses on past performance as the benchmark for degrees that will inform the future for all. Small steps in changing existing curricula might serve a university's ability to continue focusing on modes that enable its short-term survival, but from a global and societal perspective, slowly moving does not bring about the required drastic changes needed for the global community to address its manifold challenges not only resulting from the linear fashion industry, but from every unsustainable human activity encompassed.

Consequently, seeking behavioural and cultural change in alignment with FashionSEEDS' (2019: 36) demand for holism, a community and society connected fashion and textiles curriculum needs to include local stakeholders to evaluate students' positive impact. External stakeholders currently engaged with students in live briefs, perform as feedback instruments thus, already create more inclusive assessments based on diverse perspectives. Expanding this by making societal needs central to an impact-assessment process will support students to establish a mindset that is pluralistic, innovative and not grade oriented. Overall, restructuring the academic calendar for *Constructive Disruption* whilst shaping its focus to equip students to become change agents of the fashion and textile future reflecting the urgent political agenda (Hil et al. 2022: 29) can positively impact on social relationships on multidimensional levels. Nature will become students' inspiration and partner, source and aim.

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