



Article

Futuring as Part to Design Education: Hacking for a Sustainable Campus Environment

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Abstract

This article reports on a study where we used a novel method to work with university students at a media technology and design programme to innovate on questions related to futuring in an educational context. Participating students used creative methods, paper crafting and design methods to “hack” the university campus in a post-COVID-19 scenario. This study situates hackathon as a design method that can be used to foster problem-solving and critical thinking skills in the context of current challenges. The students were asked to identify possible challenges in a post-COVID-19 return on campus and consider solutions to these challenges. They were tasked to shape their solutions in the form of a “sustainable artefact” meant to facilitate a smoother, safer, and welcoming return to campus life. In this study we reflect on how they engaged critically with the campus green and built infrastructure and how have they considered changes that would make their return to campus life a positive experience. Through the analysis of students’ assignments, we demonstrate how this method allowed for space in finding one’s own voice, how the design material supported students’ work on future design, and how aspects of future design are helping students finding a way of acting upon current calls to re-work our cities.

Keywords

Hackathons, Futuring, Speculative futures, Sustainable artifacts, Design education

Introduction

The complex social and environmental challenges facing modern society require new solutions, urgent action and a transformative agenda that points the way to a more sustainable future. But such more sustainable futures are not given as these are yet to be imagined. As a result, there is academic interest in how to cultivate skills, imagination and reflectivity needed to think about what a more sustainable future could be like, and what that means in practice. Futuring as the active imagination of the future (Gidley, 1998) is gaining traction not only in policy cycles, but also in educational contexts now busy teaching about sustainability (see for example Harrington & Dillahunt, 2021; Hilson & Osei, 2014; Ho et al., 2015; Keting & Melis, 2015; Molnár & Vass, 2013). This has opened up the opportunity to use novel methods able to make space for imagination in the context of sustainability challenges.

Here, design education has important input to offer in the context of futuring for more sustainable futures. Design education has the potential to elaborate on these issues as part to the education curricula and to help students in familiarizing with future thinking. In educational settings it is important to address sustainability challenges and futuring not only because students will need to explore these issues in their up-coming professional path, but also because these are challenges, we collectively need to address. Against the background of current discussions about the pedagogy of futuring in the classroom and based on experiences from an attempt to explore a novel method together with user experience design students, we would like to provide insights into futuring.

In design education, futuring approaches include speculative design, design fiction and other methods where

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creative ways are put at work to explore alternative and possible futures (Harrington & Dillahunt, 2021; Inayatollah, 2013). These are creative methods allowing for creative expressions, reflexivity, and problem-solving skills to be fine-tuned. Along this we consider the potential of a hackathon as a problem-solving method where challenges are profiled and solutions to these sought in the context of alternative and more sustainable futures. Hackathons are a well-established method used by the tech and programming community and are a fast-paced problem-solving collaborative session where different expert profiles would joint to work on challenges and deliver ideas for solutions to these. Hackathons have been long used by private companies seeking to discover talent and innovative ideas. With the advent of open data also public organizations began using this format (see: Flus & Hurst, 2021; Jordan, 2017). However, there is a difference between technology driven hackathons and issue-driven hackathons, where the first focuses on technological innovations (Flus & Hurst, 2021) and the second on socially relevant themes in a non-technical sense (Lodata & Disalvo, 2016)

In this study we report on an activity where a slow-paced, issue-driven hackathon was used with 52 students in combination with art and design methods to 'hack' the university campus in a post-COVID 19 scenario. The students were enrolled at a media and design bachelor's programme at a Swedish university. We situate hackathon as a design method to promote problem-solving and critical thinking skills in the context of current challenges, and in the next sections we provide overview of the application of the method, an analysis of that activity with a focus on its use in design education.

Futuring in Design Education

The question of who participates in policy-relevant discussions about more sustainable urban environments and who participates in visions and futuring tasks about how our cities, technologies and artefacts will evolve in the near and distant future has become an important topic of discussion in research and practitioner communities (Harrington & Dillahunt, 2021; Keting & Melis, 2015). Researchers note that in most urban areas, the needs, and interests of some groups of residents e.g., adults and the established working population, seem to be prioritised over those of others e.g., children and young people. However, the perspectives, ideas and experiences of different generations are all relevant, and many are currently defending the need for more inclusive spatial planning and futuring. Yet, the question of how to achieve this is still largely unanswered.

Thus, our study aims to contribute to the debate on young people's (in this case young adult students enrolled at a university) engagement in futuring initiated by Gidley (1998), who established the theoretical and practical links between futuring, futuring methods, education and preparing young people for the 21st century. This idea was later expanded and refined by several others who elaborated on the role of young people as a social group in shaping a more sustainable future (e.g., Hilson & Osei, 2014; Ho et al., 2015; Molnar & Vass, 2013). Building on this debate, we would like to contribute to what methods and tools can be used to engage young people in thinking and visioning for a more sustainable living environment.

Traditional methods, such as workshops and the like, can serve well in participatory processes that focus on stakeholders who are experts, able to deal with voluminous information, complex policy scenarios or materials, and able to project complex socio-economic information into a near or distant future. However, these are less suited to supporting the engagement of young people, whose interests, values, and language are very different from those of adults and experts. Ataol et al. (2019), in their literature review on child-centred participatory processes, note that such processes often involve more creative methods than the classic roundtable stakeholder meetings. These are referred to as diagnostic methods (e.g. interviews, questionnaires), expressive methods (e.g. drawing, mapping), situational methods (e.g. discussions, field trips), conceptual methods (e.g. model building), organisational methods (e.g. children's forum/city council) and political methods (e.g. writing letters to city councillors) (Ataol et al., 2019; Horelli, 1997).

Methods that enable more creative exploration hold potential and are of particular interest when it comes to engaging not just young people in futures design - a systematic process whereby individuals or a group of participants speculate, imagine or plan for the immediate or distant future (Bleecker, 2009; Fry, 2009; Orell, 2008). Futuring in design enables both novice designers and design students in training to think about futures (individual or collective) by directly engaging and exploring both context and the concept of relevance (Harrington & Dillahunt,

2021). Through futuring, participants can think about, discuss, and explore how different aspects such as technological innovations might positively or negatively impact our interactions with each other or the environment around us. Here, design methods can facilitate the inclusion of different perspectives by providing means to develop speculative futures and future scenarios that take into account social, political, environmental as well as ethical dimensions (Forlano, 2018); they offer this potential to explore how things might be in the future (Dunne & Raby, 2013; Hupkes & Hedman, 2022). According to Inayatollah (2023) planning seeks to control the future by planning for the unknown, while future studies seek to understand the possible, probable, and preferable futures, opening up and moving from the future to alternative futures. By bringing futuring studies and methods into planning and governance we aim to bridge this gap between views on the future.

As the literature on urban governance, and the future of our cities, builds a discourse around sustainability pathways and transformation, we find that the engagement of young people in visioning, and futuring exercises becomes of special relevance. Not only will this allow building on ideas of inclusivity - now mostly grounded in race and gender – but also will allow expanding those ideas to include age and specifically younger and less represented age groups (see Gaspari & Lauren, 2013; Ho et al., 2015; Keting & Melis, 2015).

Learning design emphasises the pursuit of learning activities that target a set of core skills, knowledge and experiences that provide the pathway for entry into professional design practise (Lundmark & Jonsson, 2021; Tovey, 2015). What are considered core design skills, 'designerly' knowledge (cf. Cross, 2006), 'communities of practise' (Lave & Wenger, 1991, Wenger, 1998) for professional designers, and the competencies designers need to acquire (e.g., visuospatial intellectual skills, a creative and solution-focused approach to tackling 'wicked problems' (see Buchanan, 1992; 2001)) impact on the formulation of design education. Previous research has discussed how these aspects of design can be embedded in educational strategies by focusing on the pathways of learning by doing (Tovey, 2015; Tovey & Davis, 2011). In line with this, a design approach to learning often includes a focus on project-based activities and on the assumption that the ability to engage in design thinking (cf. Brown, 2009; Lawson, 2005) means balancing creative and evaluative thinking as a dual, simultaneous process (Tovey & Davis, 2011). Building on this, the activities underpinning this study focus on the aspects of learning by doing in the form of a project-based and issue-driven hackathon designed to engage students in a design thinking process.

Hackathons

Hackathon emerged in the context of information and communication technologies in the 1970s when programmers and tech skilled people gathered to do exploratory programming. Hackathons are commonly challenge-focused and fast-paced events where participants work in groups to find solutions to such a challenge. Definitions of hackathons differ across literatures (Jordan, 2017), but there seems to be a general agreement that for an event to be considered so there needs to be a combination of i) technology, ii) teamwork, iii) diversity of expertise, and iv) a final outcome, or product. With the increased use of hackathons by the public sector such outcome may, or may not, have form of a technological innovation (Flus & Hurst, 2021).

The literature has discussed the potential of hackathons to drive innovation, and that even when that is not a primary objective (Lodato & DiSalvo, 2016). On this Flus and Hurst (2021) refer to what in design studies is known as a divergence–convergence pattern, which includes the initial effort to form teams, and subsequent effort of working on what is then presented as a solution to the challenge introduced at the beginning.

In terms of the format hackathons are mostly done in person because there is a recognized value in the community launching this format in networking. However, recent trends in open data and non the least Covid-19 restrictions lead to many remotely held hackathons which operate under very similar features. On this worth mentioning is the massive digital hackathon event organized by the European Commission and led by the European Innovation Council in close collaboration with the EU member states, during 24–26 April 2020. That event sought to connect civil society, innovators, partners, and investors to develop innovative solutions for coronavirus-related challenges. It gathered about 20900 people online (European Commission, 2020).

It has been shown that hackathons have very good potential for innovation and agile solutions. Lodato and DiSalvo (2016) elaborate on issue-oriented hackathons, which they distinguish from the more classical format centred on technological exploration. Their formulation of issue-oriented hackathons is one organized around

socially relevant theme in a non-technical sense (societal structure, relations, and effects). In this they build upon ideas of pragmatism and design studies so to better understand how such issues are articulated and how publics interested in these are formed. The literature on hackathons is fast growing and interesting reports are expected in the coming years.

The Campus Environment

The campus which is the site students were asked to hack was constructed in the 1990s as part of strategic plans to bring higher education institutions closer to the suburbs in southern Stockholm. This initiative specifically aimed to address socio-economic disparities and various stagnation issues within those suburbs. The vision was to establish higher education institutions in close proximity to the residential areas, making them appealing to local youth and encouraging their enrolment and educational pursuits. Presently, Flemingsberg Campus has evolved into a vibrant and multidisciplinary environment, encompassing a mix of higher education institutions, research facilities, an arts school, a high school, knowledge-intensive businesses, healthcare services, a university hospital, and a social innovation incubator.

Situated in the municipality of Huddinge, Flemingsberg Campus is located in the second largest municipality in the greater Stockholm region. While there are no residential buildings on the campus itself, there are high-rise residential blocks across the main street, accommodating approximately 7,000 residents. The neighbourhood primarily consists of second or third-generation recent immigrants.

As the eighth largest university campus in Sweden, Flemingsberg Campus boasts an enrollment of around 19,000 students. The campus features a mix of low-rise buildings, natural elements (including a modest number of trees, several small meadows, a watercourse, and rocks), as well as various grey infrastructure components (such as parking lots, a central square, stairs, a train station, and a bus station). It houses several higher education institutions, including Södertörn University, the Royal Institute of Technology (KTH), the Karolinska Institute, the Red Cross University, and the Stockholm University of Music Education.

Method

In order to engage students in a systematic process of creating the future, we developed an activity where students could speculate and imagine the future in a post-pandemic scenario. The method used for the activity consisted of a step-by-step process involving a group of 52 university students. In the first step, the students were introduced to different areas: i) design studies and future planning; ii) working with paper and cardboard to communicate complex ideas; iii) hacking as a problem-solving method. In the next step, students were involved in the activity to imagine changes they would like to see in a post-pandemic scenario after returning to their university campus.

The dataset used for this analysis consists of 52 tasks containing material representations of the work done by the 52 students in the form of images of the designed artefact (details, work-in-progress, final prototype), assembly images of the designed artefact contextualised and placed in the campus environment, and written reflections about the task. The tasks were analysed using a thematic content analysis and an analysis of the sustainable artefacts.

The Hacking the Campus activity took place in December 2020 in collaboration with a university study programme. We developed this activity in collaboration with the Swedish three-year BSc programme IT, Media, and Design as part of the Design, Innovation and Creativity module offered to students in the second year of this programme. The programme is very popular and regularly enrolls around 50 students at a yearly cohort, usually in their early twenties.

To engage the students in a systematic process of future-making (cf. Fry, 2009; Orell, 2008), we wanted to develop an activity where students could speculate and imagine the future in a post-pandemic scenario. We started planning the activity in the summer of 2020. Considering that in 2020 we were still in the pandemic phase, we had to plan the activity under the constraints and political circumstances of the time. The whole activity was to be conducted remotely. We worked with the module coordinator to develop a curriculum that reflected the classic workflow of a hackathon but supplemented it with practical methods and concepts already included in the curriculum. This was done in collaboration with other team members and teacher colleagues, and an invited guest

artist, Annalisa Metus, who specialises in paper crafting.

So, the method used for the activity consisted of a step-by-step process with a group of 52 students taking the module. In the first step, at the beginning of the module, the students were introduced to different areas by the course leader, and we gave students an overview of our research project and the guest artist gave an inspiring talk on using paper and cardboard to visualise needs in an urban environment and answered questions. These sessions aimed to help students approach the challenge and see how they work on their ideas of what a campus should look like after the pandemic COVID-19 as this situation also requires radical change. The next step was to engage students in the activity to imagine changes they would like to see on their university campus after returning to a post-pandemic scenario.

Data collection and analysis

In this study, the creative methods used resulted in both a tangible "material" representation of the work (cf. Finley et al., 2014), images of the artefact placed in context, and written reflections on the task and issues related to the work process. A total of 52 tasks were submitted. All tasks consisted of images of i) a sustainable artefact (close-ups, details, artefact in progress, final prototype), ii) an image montage of the designed artefact in the campus environment, and iii) the written reflections on the work progress, the final designed artefact, and the reflections on the given questions (see Appendix 1).

Based on the submitted tasks, we analysed the written reflections and the four questions posed in the task using thematic content analysis (see Braun & Clark, 2006), which aimed to identify and analyse the student's reflections.

According to Braun and Clarke (2006) themes can be understood as a pattern that can be interpreted from the material and must reoccur in the material. Themes must also be relevant regarding the aim of the study and the research questions. The emergent themes located in the analysis of the assignments where 1) material and technique, 2) ideas and concepts, 3) logistics, 4) transformation from analogue to digital, and 5) general aspects about sustainability and futuring. These themes will be covered in the result section.

Drawing on the thematic analysis of the assignments we deepened the analysis and restructured more general themes based on both the defining words, the images, and the written reflections. The three themes based on the empirical analysis will be presented in following. When presenting the results, we will use illustrative quotes drawn from the written assignment and images showing the artifacts. The quotes used have been translated from Swedish to English, largely on a word-by word basis with some adjustments for English syntax.

Results and Discussion

Drawing on thematic analysis of the assignments, the defining words, the images, and the written reflections, three recurring themes emerged: reflection of personal experiences, material as a means for design, and futuring in the context of the pandemic. In the next section, we will present these emerging themes. Additionally, we will discuss the use of hacking as a method to foster skills in problem-solving and critical thinking in the context of contemporary challenges and to position this method in terms of futuring in design education.

The designed artifacts that the students handed in were created from a range of different ideas and observations. For example, some were made with the purpose to reduce stress, others to promote mental and physical health, or to boost social gatherings and togetherness. The typology of these spans from artifacts that are inspired by furniture that promotes meetings and social interaction, collective gardening areas, bird nests, litter containers, green houses, training equipment, tools to provide feedback, interactive screens, and power stations both for bikes and phones.

In the assignment the students were to describe their designed artifact by using three words. These words revolved around the intention with that artifact, but also around words defining the look of the artifact. In total 118 unique words were used. The fifteen most common used words were Health, Community, Nature, Calm, Relaxation, Energy, Simplicity, Harmony, Sustainability, Information, Climate smart, Creativity, Modern, Exciting, and Security. In Figure 1, all the words are visualized showing the most used marked in bold. The words used demonstrate that the students aimed to create artifacts that afford values linked to both environmental sustainability and social sustainability promoting community building.

campus environment, as it is an important factor that underpins the community among students.” The student here, highlighted the community building aspect as important for students at the campus. The social factors have previously been proven as important for people in the same age group that the students are within. The analysis suggests that students tend to come back to the social dimension as the dimension they want to leverage with their designs. Also, they note this being something to have affected them and wanting to express as important for themselves in making room for their own voices.

“The source of inspiration for this idea is from the fact that I have been down and gloomy during this month, when it has been so dark outside with zero hours of sunshine and lack of social interaction due to the pandemic that prevails in the world. This combination leads to many people feeling mentally ill as it is not the normal everyday life we are used to. I joked with my mother and told her that maybe we should buy an electronic sun for the patio so you could get some pretend sun here at home. And there my thoughts began to set in motion.”

The above quote illustrates how the student is triggered by the environment and the weather conditions in Sweden in December, but also by the lack of social interaction. Imagination is mainly influenced by context (Osborn, 1963), and the specific conditions that we currently are dealing with. Drawing on her/his experience and situation at these specific times the student describes the process of creating a space that could make ease on the current situation.

In overall we observed that the issue-driven hackathon activity has allowed for space for these students to express themselves in a way that we have not seen in other assignment provided during the education. In line with Ho et al. (2015), Gaspari and Lauren (2013) and Keting and Melis (2015) the less represented group as of young people needs to be welcomed in community processes to have their own voice. In the specific case by deriving from their own situation the students allowed themselves to shape their ideas based on their own experiences. The way the activity was designed allowed for this reflection and based on own needs and experiences during the pandemic they could related that to the assignment and to the experience of other fellow students. Being themselves, students was a point of departure. In the data it became prominent that the students base their designs on their own perspectives and interests. Many of the written reflections begun with expressions like, “based on my own experience...” and “on a personal level...”. Tapping on personal connections, ranging from bodily experiences to the importance of making informed sustainable choices, the students situate their entries to the challenge based on their own lived experiences. One student connects her/his experience of her/his own living area and its surroundings to the need of biodiversity and closeness to nature in times of social exclusions based in the pandemic and addresses these complex needs by designing a bird nest.

“[...] I believe that our campus needs more biodiversity and therefore, I wanted to make it more accessible in relation to nature. My source of inspiration is the area I live in. I have a lot of nature and birds chirping and flying around everywhere. I think it creates a kind of harmony which makes me very happy and positive, especially now when I study from home and do not meet friends. The pandemic prevents social interaction, which has affected me in a negative way. It can feel lonely to be home all day and that's why I think the birds in a way fill the void. I wanted to develop the artifact in some way so that it is not just a simple bird nest”.

The bird nest here, aims to meet the needs that has been highlighted by the pandemic and in turn not being “just a simple bird nest”, thus filling a substantial need of social interaction, harmony, and closeness to nature.

Materials as a means for learning problem-solving and critical thinking skills

An important aspect of the study was to explore how the chosen materials, namely paper and cardboard, could be utilized in challenge-driven and problem-solving activities related to futuring. In order to assess this, we examined both the manner in which these materials were employed to construct the artifact (refer to Fig 2 for examples of how the designed artifacts were presented) and also requested the students to reflect upon these specific aspects, considering how the materiality of the task either facilitated or hindered their expressiveness. We were particularly

interested in the challenges they encountered when working with these materials for the intended purpose.

Therefore, it is noteworthy that in their written reflections and assessments, the students addressed various aspects, such as the properties of the materials, achieving the appropriate scale, and the absence of necessary tools, among others. One student commented on the difficulty of using paper to physically materialize their ideas, highlighting the challenges associated with idea generation.

“Creating the physical artifact from paper was as difficult as developing ideas, especially if you are not used to designing prototypes by using physical materials, but the work became easier and clearer with some sketches that showed how the artifact should look like.”

Other students found it easy to work with the material and expressed that they were surprised about how easy it was.

“Designing the sketch by hand gave me a clearer experience of how the artifact would feel by the users, in addition, I found it fun and not so difficult to use simple materials such as paper, corrugated cardboard boxes and a glue gun to shape my idea.”



Fig 2: The first image illustrates a fountain surrounded by sitting places, isolated but still interconnected [Photo: Marica Myhre]. The second illustrates a sitting place for relaxation and meditation [Photo: Alethe Hjuberger]

The use of creative methods has previously been emphasised in planning for sustainable communities (Ataol et al., 2019; Derr et al., 2018). The potential for the participants to express themselves in more creative ways that might carry further value, not the least by the tangible product representing the work, opens for others to enter the conversation (Finley et al., 2014). In this case the students all are part of an educational programme focusing on design and media technology where they are used to work creatively, however mostly in a digital form, expressing themselves by using digital materials such as programming, graphics, and digital imagery. Most of the students commented on the use of paper and cardboard, as both challenging and a joyful and fun experience. As an example, one student writes that “Working with paper was both a challenge and a joy. My artifact was relatively easy to create from paper, but it was important to find the right variety.” And another one states that; “Working with the artifact has been both challenging and surprisingly fun. I have become familiar with paper and learned new techniques that I believe will benefit me in my design practice in the future.” These quotes represent the students’ reflections about the joyful and fun experience in working with the material at hand, and how this challenge provides knowledge for the future.

Challenges with the design and conceptual work were discussed by the students as both in terms of patience (i.e., time consuming), and in terms of making it look like they wanted. Difficulties in molding it in ways that is generally

understandable and informative about the intended use also by others were also a topic.

“What I found challenging about creating the prototype was that it was time and patience consuming. It was difficult to design the prototype so that it looked the way I wanted. It also required calm to not to accidentally break the fragile material paper.”

Logistical challenges put to the fore by the students revolved around missing materials in their home environment, being afraid of going outside to buy the material wanted, or that the materials missing was too expensive to buy. Most students reflecting on this also wrote that they used other materials instead which did not work as good as expected in the first place.

Other aspects put to the fore were the logistical challenges of handling the fragile material as paper can be. Several students described incidents where they have destroyed their prototypes while trying to move them around or when they were using tools trying to shape them. These logistical challenges also highlight the student’s involvement with problem-solving reflected in the task at hand.

Embedded in the assignment was also the indication to digitalize the artifact in terms of taking a picture of it and place it in the intended physical location (see Fig 3 and 4 as examples of how this is executed). For this task they needed to with a digital photo montage that required the use of a software (i.e., most commonly Photoshop and Gimp). This step served to move from the abstract to the practical as they were asked to place their artifact into the real space on campus, albeit on the computer screen. Some students that mentioned difficulties in getting the right scale, highlighted as important to make the artifact look real and blend into the setting and imagery. Others mentioned lacking images they needed given that due to COVID-19 pandemic it was not possible to go on the campus area.

“Digitizing the artifact and placing it in the imaginary environment was the most interesting part of the process, as it evoked a more realistic vision. In addition, visualization of the artifact created a more real-world scenario of the artifact in connection with the intended environment and users.”



Fig 3: The Breathing mushroom added to an image of Södertörn University Library [Photo: Sofia Wigen (Original Photo: Lindbom, P. <https://www.aix.se/projekt/biblioteket-pasodertorns-hogskola>)]



Fig 4: The Regeneration for ideation artifact, a sustainable furniture that encourage sustainable ideas and meetings in a post-pandemic scenario [Photo: Desirée Strand]

Potential of futuring as a method for hacking in the context of pandemic

A core element of the task involved imagining and projecting the needs and possibilities of the location into a future when we would all return to campus. The element of futuring in this activity is of great importance as it explores how individual needs intertwine and how they will materialize when we reconvene as a physical community. Back in Fall 2020, when the assignment took place, the collective struggles, needs, and expectations we would have in returning to campus post-COVID-19 were largely unknown to us. Therefore, it was a significant challenge for the students to imagine, question, and work within the context of an uncertain future. Adding to the challenge was the fact that they were asked to envision a future for a place they were not yet familiar with. Several students highlighted the difficulty of not having the opportunity to physically visit the campus and see the space they were tasked with hacking.

Planning for future urban areas and envisioning their appearance is an exciting yet complex task. Typically, planners focus primarily on the physical features and aesthetics of places, such as benches and buildings. However, when discussing places with young people, it is crucial to consider not only the physical infrastructure but also how it can either inhibit or facilitate social interaction, socializing, and the utilization of space by young people both individually and in collaboration with other age groups. This aspect is often overlooked, with the emphasis placed more on the placement of buildings and infrastructure. However, working towards more sustainable spatial planning requires us to pay attention to how urban spaces promote or hinder social interaction and who benefits from them. Our students found this intangible aspect of cities intriguing and offered thought-provoking reflections on it. Furthermore, several students expressed their aspiration to change the future through their designed artifacts. These artifacts served as solutions to address some of the problems we currently face during the pandemic. The students described designs aimed at reducing the spread of infection, increasing distancing in public areas, minimizing large

gatherings, and promoting environmental change. One of the students express that;

”[...] I wanted the artifact to contribute to a short environmental change for those who walk through campus. During the pandemic, environmental changes have been difficult to achieve, especially when most matters have begun to take place from the safe corner of the home. During Covid-19, we have really realized the importance of environmental changes and how much they can contribute to one's mental health. I therefore wanted a dozen steps through the artifact to contribute to the feeling of change and environmental change.”

The students also reflect on our changing behaviours due to the current circumstances. For example, they express that we have gained a new behaviour of meeting and socializing outside to a larger extent. That this behaviour changes are a part of new future.

Other reflections on our new future are that we are in more need of security and socialization with other people. That we are facing conditions where the students are more exposed to anxiety and stress. And that safety is a keyword that is present both when it comes to social aspects, as well as safety physical environments and the safety to meet other people without being exposed to further risks.

In the analysis of the assignments, it has been prominent that the students do not want to promote a dystopian vision for the future, rather they describe a future with positive traits. Interestingly the potential of exploring how things could be in the future brought to the fore by design methods on speculative and sustainable futures (cf. Dunne & Raby, 2013; Hupkes & Hedman, 2022), seems to leverage on the positive outcomes. For example, of being able to meet people again that we are facing a time in the post pandemic society. The students for example expressed that we would need to socialize much more in the aftermath of the pandemic, and that “we are now beginning to see a brighter future with, among other things, an impending vaccine, which may soon mean that we can still our longing for physical contact”. Another student expresses the futuring as such;

“[...] we have many grey and depressed months in Sweden every year. This station could possibly help students feel better and maybe even be peppery for people suffering from some kind of mental illness. Giving a stranger a compliment is not so common in Sweden and therefore this artifact can affect the cultural norm [...]. The student may come to campus on a dark winter day and not feel so good inside. This station I hope can light up the student's day with a little warmth, sunlight and maybe add a little motivation with a few nice and spicy words. During these dark times, the station creates a community and love when you step into the heat and spread positivity which in turn creates a positive culture on campus.”

The social aspects of the future, highlighted by the students, emphasize the importance of socialization in a post-pandemic scenario and also point to positive outcomes. The afore mentioned quote emphasizes the goal of fostering a positive culture on campus upon returning there after the pandemic. Therefore, futuring design methods offer resources for developing speculative futures that encompass social, political, environmental, and ethical dimensions (Forlano, 2018). In this study, the students primarily focus on the social and environmental dimensions in their futuring work related to hacking the campus. Engaging young people in futuring, as noted by Gidley (1998), also prepares them for the challenges of the 21st century. In this case, the preparation for the future lies not only in the futuring work itself but also in having a voice in shaping more sustainable futures (Hilson & Osei, 2014; Ho et al., 2015; Molnar & Vass, 2013) by envisioning and considering more sustainable living environments. However, it is interesting to note that the students in this study did not predominantly focus on political and ethical dimensions, with a few exceptions. Instead, their focus primarily revolved around normative values and ethical considerations such as health and various social implications.

Interrelationships and suggestions for future research

Based on the results, we will now first revisit the three themes mentioned earlier and explore their interrelationships. Secondly, we will discuss our findings regarding the potential of issue-driven hackathons for futuring in design

education, as well as the role of futuring in empowering voices within the context of creating more sustainable cities.

As demonstrated in this study, the approach of future thinking in design education was realized by employing hacking as a prospective educational tool. This allowed students to develop their ability to think about challenges or contemporary issues within a projected future timeline. The study focused on analyzing the students' work in delivering products and services while considering this timeline.

The futuring aspect of the issue-driven hackathon (see Lodato & DiSalvo, 2016) enabled students to contemplate the delivery of products and services as potential solutions to present challenges, while keeping in mind the sustainability implications for the future. The analysis of emerging themes showcased how students engaged in reflection regarding these issues, and how the method of the issue-driven hackathon provided a space for finding one's own voice. The assignments served as tools for personal reflection, which encompassed references to lived experiences and students' aspirations for creating a more sustainable future. Additionally, the analysis revealed how the design materials employed supported the process of futuring, while reflections on their usage facilitated critical thinking and the adoption of a problem-solving approach.

Furthermore, the analysis highlighted that hacking, within the context of a pandemic, demonstrated the potential of futuring in addressing significant societal issues that might be challenging to handle in the present. It emphasized that futuring is crucial in supporting the exploration of alternative perspectives and finding a voice to address the current imperative for reimagining our cities. This study introduces a novel approach to engage design students in innovating on futuring-related questions within an educational context, employing the issue-driven hackathon as a design method (Lodato & DiSalvo, 2016). Furthermore, it investigates the utilization of hackathons as a valuable resource in design education, examining their role in enabling students to visualize possible, probable, and preferable futures (Inayatollah, 2013). The study emphasizes that while hackathons have previously demonstrated effectiveness in fostering problem-solving and critical thinking skills, this research specifically underscores the method's potential to bridge design education and futuring, thereby developing the necessary skills to strive for more sustainable futures amidst contemporary challenges.

By drawing on the context of contemporary social processes, including recent waves of youth environmental mobilization, this study provides interdisciplinary insights into the literature on futuring with and for young people. It reflects on questions that have received limited attention thus far. By employing the creative method of issue-driven hacking as a resource for futuring in design education, this study opens up opportunities to comprehend students' perspectives, which can contribute to societal sustainability. Additionally, it emphasizes the significance of pluralizing worldviews and perspectives in design education to inform scholars about potential futures, particularly by learning from those who have not traditionally held positions of power and dominance. This approach has the potential to educate designers in addressing society's most significant challenges in the future.

Conclusion

In conclusion, the study has demonstrated that issue-driven hackathons can serve as valuable tools for future thinking in design education, particularly in addressing contemporary challenges and promoting sustainability. Through the analysis of students' work within this method, the study highlights the potential of hackathons in facilitating personal reflection and the development of individual voices, while also fostering critical thinking and problem-solving skills. Furthermore, the study underscores the significance of incorporating diverse worldviews and perspectives in design education to enhance scholars' understanding of future possibilities and to promote sustainable outcomes. Overall, this study provides valuable insights for educators and designers aiming to advance futuring and sustainability in their respective fields of work.

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