

Design and Development of The Playground, a Pre-Incubator Space for Entrepreneurial Students at Utrecht University

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February 20th, 2023



Utrecht University

MSc Science and Business Management

Business Internship Report

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Timeframe: Sep 22 – Feb 23 (19 weeks, excluding holidays)



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Management Summary

In conjunction with global trends towards university-wide entrepreneurship education (Pittaway et al., 2017), the Utrecht University Centre for Entrepreneurship (UtrechtCE) has established itself as the first point of contact for all students and employees at Utrecht University (UU) who are looking for inspiration, information, and support for entrepreneurial education and activities. UtrechtCE adopts a broad perspective on entrepreneurship, where entrepreneurship is about spotting opportunities and daring to act on them in order to create something new that has value for others. Despite the existing (learning) opportunities to become entrepreneurial at UU, UtrechtCE has noticed low entrepreneurial student activity in continuation from entrepreneurial education. In 2019, for instance, there was merely a 1% turnover rate to student programs of the university startup incubator UtrechtInc. To bridge the gap between innovative education and more entrepreneurial student activity, UtrechtCE has proposed a physical space [dubbed: *The Playground*] at the Utrecht Science Park (USP), where all students could come in and work on their ideas. The concept of a physical innovation space is supported by literature from the innovation and creativity disciplines (Oksanen & Ståhle, 2013) and has been implemented on different occasions elsewhere (Pittaway et al., 2017). At UU, it could function as an innovative classroom for entrepreneurial education as well as a home to a new entrepreneurial student community. Although general design guidelines are available (*Space for Learning*, n.d.; Richardson & Mishra, 2018), it was unclear what the ideal design of the space would be at UU in consideration of the respective student needs.

Therefore, this study aimed to investigate design criteria that are likely to make the proposed space attractive for its target users, i.e., UU students. The study design was inspired by Design Thinking (DT) (Tschimmel, 2012) and utilized an inductive qualitative research approach that was structured according to the Double Diamond DT process model design. A total of nine focus groups with 253 UU students from four faculties, i.e., Faculty of Science (BETA), Faculty of Geosciences (GEO), Faculty of Law, Economics, Governance and Organization (REBO), and Faculty of Humanities (HUM), were conducted. Through conventional content analysis (Hsieh & Shannon, 2005), the major meanings that appeared in the students' perspectives were extracted. To add context to the focus groups, benchmarking material from ten other (inter)national innovation spaces, i.e., nine spaces in the Netherlands and one space in Switzerland, was used for comparison.

The seven focus groups in the first diamond aimed to find components that would make the proposed space most likely attractive to students. Findings showed that students mainly wanted to come to the space to work together on ideas, connect with like-minded people, learn by doing with input from others' experience, and take breaks in a distinct recharge space. To do so, they required, amongst others, expertise from people and designated spaces within the multipurpose space. Most importantly,

the atmosphere had to reflect a combination of productivity, collaboration, and support, otherwise it would be the main reason for students not to make use of the space. Various other reasons were noted that included not having enough time, not feeling ready, being afraid or not motivated, or not seeing the added value of the space. Aligned with these findings, other innovation spaces also emphasized project-based work of student groups and the aspect of community at their locations. In addition, they often offered prototyping and seed funding, and had selection processes in place to regulate student access to their spaces and activities. Overall, in the first diamond, a higher interest in the concept of *The Playground* was recorded from the participants at BETA, GEO, and REBO, than from participants at HUM.

To understand how the components, as described above, could be realized in the actual space, in the second diamond, one focus group for prototyping purposes and one focus groups for testing purposes were conducted at the proposed space on the USP. Six UU students created six digital prototypes of *The Playground* on Pinterest.com, compiling images of group and individual work in a combination of open and closed-off spaces with writable surfaces and screens, opportunities to build prototypes, and active or passive work breaks in a recharge space with a pantry, also suited for informal conversations. Subsequently, the images were presented as one prototype on Miro.com to four other UU students, which agreed with its main aspects but emphasized the right balance in design to facilitate both productivity and creativity. They added technical infrastructure components, such as power outlets and monitors. Overall, the suitable atmosphere was envisioned through a different look of the space than other spaces at UU, plants, the presence of motivated students and the visibility of their projects. Many of these elements were also found at the innovation spaces used for comparison. These findings show that, to be attractive to students, the spatial design of *The Playground* must set the stage for entrepreneurial activity with its look and people that share mindset and values.

Based on these findings, a list of recommendations in terms of spatial design and of community is shared with UtrechtCE. Highlights include the recommended incorporation of a variety of open and closed-off spaces that are designated for different functions, ranging from group or individual work and events to recharging and (informal) meetings. Given the multifunctionality of *The Playground*, modifiability of the spaces should be considered, for instance, through movable furniture and writable surfaces. It is recommended, as seen at other innovation spaces, to involve motivated students in the design and operational decisions regarding the space and provide expertise in support of student projects. Although this study could benefit from additional prototyping, testing, and research, for instance, in the needs of students at other faculties of UU that were not considered herein, this study provides first evidence for student interest and a validated recommendation for the continuation of the development of *The Playground*.

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1. Introduction

In recent years, there has been an accelerating trend towards the construction of dedicated infrastructure to enhance entrepreneurship education at universities (Pittaway et al., 2017). This trend discerns four types of infrastructure, ranging from student incubators/accelerators and materialization labs to entrepreneurial dorms and mixed-use facilities, the latter often hosting the university's Centre for Entrepreneurship. Driven by a trend towards university-wide entrepreneurship education, mixed-use facilities are typically located at a central place on campus and focus their spatial design and activities on the multiple aspects of entrepreneurship, including ideation, collaboration, networking and events, innovative classroom space, pre-incubation and incubation space (Pittaway et al., 2017).

The Utrecht University Centre for Entrepreneurship (UtrechtCE) was founded in 2008 to strengthen the entrepreneurship education infrastructure at Utrecht University (UU). Since 2023, UtrechtCE is a structural unit at UU and receives direct funding from the executive management of UU. Its core team is composed of three members, Rianne Poot, the *external cooperation coordinator*, Carlijn Schäffers, the *communications officer*, and Erik Stam, the *academic director* and dean of the Utrecht University School of Economics (U.S.E.), where UtrechtCE is affiliated with. UtrechtCE adopts a broad perspective on entrepreneurship, where entrepreneurship is about spotting opportunities and daring to act on them in order to create something new that has value for others. As stated in its Vision 2023-2027 paper, UtrechtCE's strategic objectives are "to improve the breeding ground for entrepreneurship and also appeal to the entrepreneurial potential that currently remains untapped"¹. Towards such goals, it focuses its efforts on three pillars: creating entrepreneurial awareness (pillar 1), further strengthening entrepreneurial education (pillar 2), and contributing to the development of a thriving entrepreneurial ecosystem (pillar 3). UtrechtCE's vision is aligned with UU's Strategic Plan 2025, which aims to encourage "the entrepreneurial spirit, innovation and creativity, along with other related skills, among students and employees" (*Strategic Plan 2025*, n.d.). Currently, its activities for students are mainly virtual, realized through its digital communication channels, i.e., website, social media, and email, and through personal consultation of students and teachers.

To their concern, UtrechtCE and its partners in the university's entrepreneurial ecosystem, such as the university's startup incubator UtrechtInc, have noticed low turnover rates of student participation in entrepreneurial education to extracurricular student startup programs. In 2019, for example, 33.6% of UU graduates (= 3127 students; considering a total of 9306 UU graduates in 2019²) had been enrolled in entrepreneurial education³ at least once during their studies (source: Carlijn Schäffers,

¹ The document was shared with the researcher internally upon her onboarding at UtrechtCE.

² <https://www.uu.nl/sites/default/files/UU-Jaarverslag-2020-NL.pdf>; p.155.

³ Herein defined as entrepreneurial courses or programs that are listed on the website of UtrechtCE.

communications officer at UtrechtCE). In contrast, in the same year, an estimate of 30 students signed up for student programs run by UtrechtInc (source: Stefan Braam, *startup incubation lead* at UtrechtInc). Hence, in 2019, the turnover rate of student participation in entrepreneurial education at UU to student startup programs at UtrechtInc was merely at 1%.

Therefore, UtrechtCE has identified the need to facilitate more entrepreneurial student activity, in continuation from student participation in entrepreneurial education. To address this need, UtrechtCE has proposed a physical space at Utrecht Science Park (USP). Acknowledgement of a physical environment can be found in both theoretical and empirical studies on innovation (Oksanen & Ståhle, 2013), although arguments have been made for but also against the contribution of physical spaces to, for instance, collaboration (Brager et al., 2000; Irving et al., 2020; Nova, 2005). In this context, a physical space was favored by UtrechtCE over conceivable alternatives, such as a digital innovation platform. It would enable, amongst others, the accommodation and visibility of in-person curricular and extracurricular entrepreneurial activities and events as well as the possibility to invite external guests to a suitable, branded location on campus. These features are relevant for the realization of UtrechtCE's strategic ambitions; for example, the tangibility of entrepreneurial behavior at the proposed space would address UtrechtCE's efforts in creating entrepreneurial awareness (pillar 1). Moreover, physical presence and the development of "testing grounds" have also been noted in UU's Strategic Plan 2025 (*Strategic Plan 2025*, n.d.). The original concept for the space⁴ dates to November 2021 and outlines a place "where all students can come in with an idea and start working on it"⁵. The proposed space [dubbed: *The Playground*] could function as an innovative classroom for entrepreneurial education as well as a home to a new entrepreneurial student community at UU. The proposed concept of *The Playground* is in line with the definition of makerspace, found in literature, as "a creative, uniquely adaptable learning environment with tools and materials, which can be physical and/or virtual, where students have an opportunity to explore, design, play, tinker, collaborate, inquire, experiment, solve problems and invent" (Loertscher et al., 2013). The ideal design of the space, however, was yet unknown. Despite the implementation of similar spaces on other occasions and locations globally (Mersand, 2021) and the availability of general design indications (*Space for Learning*, n.d; Richardson & Mishra, 2018), this project was seen as a context-dependent endeavor that requires customization to the user needs to be effective (Santos et al., 2021). Notably, an innovation space should reflect the values of its users and organization to be successful (Oksanen & Ståhle, 2013), otherwise it might lack support from both.

⁴ 'Space' in this report refers to "physical place", unless noted otherwise.

⁵ Translated from Dutch; described in UtrechtCE's internal proposal "*Conceptvoorstel ACCUU*", 25-11-2021.

All the considerations above led to the following main research question (RQ) that was formulated by the researcher at the beginning of this study:

*How can UtrechtCE design a physical space to facilitate entrepreneurial behavior among UU students?*⁶

Based on this main research question, two sub research questions were formulated as:

1.) *What are the components that would make the proposed space most likely attractive to students?*

2.) *How are these components realized in the actual space?*

To structure the investigation of these research questions, a Design Thinking (DT) approach was used. DT is a user-centric approach to problem-solving, which is well established in design to business contexts (Tschimmel, 2012). Importantly, it challenges early-on in the design process assumptions of the designer about the user needs through engagement and empathy with the users (Dam, 2023). This approach was applied herein to find user-validated design criteria for the proposed space and, thereby, avoid the development of a space that could be unattractive to UU students. The two sub research questions⁷ were addressed in the two parts, or diamonds, of the chosen DT process model, the Double Diamond (The Double Diamond - Design Council, n.d.), respectively. They were investigated in focus groups with UU students and complemented with benchmarking material of (inter)national university-associated innovation spaces. If kept unaddressed, UtrechtCE would need to rely on best practices of innovation spaces in other contexts and general design indications to define design criteria for *The Playground*. Accordingly, there would be less evidence and characterization of the interest and future engagement of UU students with the proposed space. If the project failed to get support from the university throughout its development or failed to attract students upon opening, UtrechtCE would be restricted to current formats of activities or, alternatively, had to host its activities and events at changing locations on campus. In doing so, UtrechtCE would likely still be able to realize its strategic plans to some extent but without the expected synergy effects of the collocation of entrepreneurship education, entrepreneurial student activities, and hosting relevant external parties, to facilitate student entrepreneurship at UU. On a university-wide level, without a thriving UtrechtCE, UU would need to depend on less specialized entities within its organization instead to realize its strategic plans with regards to entrepreneurship.

⁶ In line with DT, at the start of the second diamond, this research question was refined with insights from UU students to: *How can UtrechtCE design a space that creates the right atmosphere for UU students to work on their ideas and projects, connect, learn, and recharge from work?*

⁷ Throughout the report, whenever the “first” or “second” research question are mentioned, the researcher refers to the two sub research questions, respectively.

This study presents findings that result in a student-validated recommendation of design criteria for *The Playground*. The report will start with a more detailed company profile of UtrechtCE, which includes a SWOT analysis, followed by a description of the methodological framework used in this study. Then, the findings of this study will be presented in order of the two parts, or diamonds, of the Double Diamond model. After each part, the findings will be summarized and compared to the selected Dutch and Swiss innovation spaces. The final discussion will put the findings into context with existing literature on entrepreneurship education infrastructure, reflect on the (practical) execution of the study, and call for additional research based on the findings and limitations of this study.

2. Company Profile

UtrechtCE was founded by Hein Roelfsema and Erik Stam in 2008 as a project at UU. It was initiated as an “*etalage voor ondernemerschap*” (Dutch, translated: “showcase for entrepreneurship”) with the aim to introduce external parties to the entrepreneurial activities at UU. Structurally, it consisted of a composition of members of various departments that were temporarily part of this project. Over the years, UtrechtCE’s aim changed towards strengthening entrepreneurship university-wide and it adopted a broader perspective on entrepreneurship, highlighting a distinct attitude and associated skills. In this time, UtrechtCE’s visibility increased through its expanded website appearance that served primarily as a guide to the different parts of the university’s entrepreneurial ecosystem. From 2021 to 2022, UtrechtCE actively induced its transition from a temporary project to a permanent unit of UU. This led to the integration of UtrechtCE on January 2023 as a structural part of UU, located at the Faculty of Law, Economics, Governance and Organization (REBO), where it is affiliated with the Utrecht University School of Economics (U.S.E.). Accompanied with an increase in structural funding from the executive management of UU, UtrechtCE has the financial resources to grow its team to five full-time employees in 2023. Hence, UtrechtCE is actively recruiting currently. At this moment, UtrechtCE has an office space at the international campus of the University College Utrecht, which is suitable for five people. This office space, however, does not consider the two working students that are momentarily employed by UtrechtCE. Soon, therefore, UtrechtCE will need to increase its office space to accompany its growing team. Within this core team, UtrechtCE operates with a flat organizational structure.

Stated in its Vision 2023-2027 paper, “UtrechtCE adopts a university-wide approach and broad vision on entrepreneurship. Entrepreneurship comprises an attitude, supported by skills, that leads to new value creation for society, relevant to education and research in all faculties”⁸. Based on this definition of entrepreneurship, UtrechtCE focuses its activities on the three pillars of creating entrepreneurial awareness (pillar 1), strengthening entrepreneurial education (pillar 2), and its contribution to the development of a thriving entrepreneurial ecosystem at UU (pillar 3).

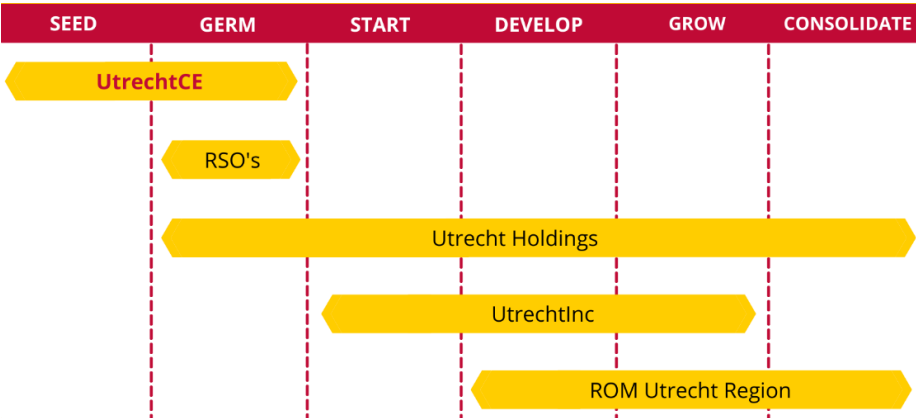
Currently, UtrechtCE offers information, inspiration, and support on topics related to entrepreneurship to its audience, students, teachers, and (aspiring) entrepreneurs, through its website (www.uu.nl/entrepreneurship), social media channels, i.e., Instagram ([@uucentreforentrepreneurship](https://www.instagram.com/uucentreforentrepreneurship)) and LinkedIn (*Utrecht University Centre for Entrepreneurship*), and email contact (entrepreneurship@uu.nl). The website comprises a structured overview of entrepreneurial courses and programs, listed by faculties, as well as extra-curricular activities, videos, and visual overviews.

⁸ The document was shared with the researcher internally upon her onboarding at UtrechtCE.

Moreover, UtrechtCE organizes events for students with its partners, such as UtrechtInc; for example, previous event formats include an ‘Entrepreneurship Day’ with workshops on entrepreneurship and a ‘Fresh Feedback Night’, where the audience was invited to help a startup team with specific questions. For teachers, UtrechtCE additionally offers guest lectures and workshops for courses as well as an (inter)national community, the Entrepreneurial Education Network.

Within UU’s entrepreneurial ecosystem (see Figure 1), UtrechtCE is the first point of contact for students and employees, seeding and sprouting entrepreneurial mindset and skills. Other players in the ecosystem include the Research Support Offices (RSO’s), that support entrepreneurial employees with their ideas, and Utrecht Holdings, the university’s knowledge transfer office that assists intellectual property (IP) rights protection. UtrechtInc incubates digital, scalable technology-based startups, founded by students, employees, and researchers at UU. Extending the entrepreneurial ecosystem outside of the university, ROM is the organizational network for entrepreneurship and startups in the Utrecht region.

Figure 1
UU’s entrepreneurial ecosystem



To evaluate the strategic position of UtrechtCE within the university, a SWOT analysis (see Figure 2) was carried out, using insights gained in conversation with the current *managing director* Rianne Poot. While the strengths of UtrechtCE lie in its lean and young team (with an age average of 32 years) that can quickly act and address the needs of its equally young student audience, its impact is inherently limited by the small number of its team members, which currently lack an experienced entrepreneur amongst them that could use their experiences to support the target audience. On the upside, the decentralization of UtrechtCE at REBO and the U.S.E. creates a certain freedom in its endeavors, for example, to try new formats for events more easily. On the downside, this structural association creates administrative difficulties in hiring personnel and defining responsibilities, as, for example, personnel in communication functions typically also must execute general communication tasks in the

department that they are associated with. Importantly, the office location outside campus, i.e., the Utrecht Science Park, where most students go to class, limits UtrechtCE’s visibility and tangibility to those students. While the small, mobile, and ambitious core team of UtrechtCE has turned its strengths into opportunities, when they received increased funding that allow the expansion of the team and its activities in 2023, it is simultaneously confronted with an expectedly growing number of requests which it might struggle with to serve appropriately.

From a strategic perspective, therefore, *The Playground* has the potential to solve the issues of visibility and tangibility and create synergy effects between UtrechtCE’s ambitions, such as showcasing entrepreneurship (serving pillar 1), hosting entrepreneurship education (serving pillar 2), and being a collaborative and supportive addition to the university’s entrepreneurial ecosystem (serving pillar 3). Also, the colocation of these activities at one physical space could streamline and ease the organizational efforts of the small team, which, thereby, could keep its leanness while increasing its impact and ability to address increasing requests.

Figure 2

SWOT analysis of UtrechtCE

Strengths	Weaknesses
<ul style="list-style-type: none"> Lean team that can quickly act. Young team that can address the needs of a young student audience. Decentralization creates freedom in activities. 	<ul style="list-style-type: none"> Impact is limited to a small number of team members. Core team does not have an experienced entrepreneur. Association with a specific department of a specific faculty creates administrative issues. Not clearly visible or tangible to students.
Opportunities	Threats
<ul style="list-style-type: none"> Small team can quickly adapt to dynamic circumstances. Increased budget allows the growth of the team and its activities. 	<ul style="list-style-type: none"> Small team cannot serve the multitude of requests while achieving its targets.

3. Methodological Framework

3.1 Research Paradigm

This study belongs to the research paradigm of pragmatism. The research paradigm is determined by the researcher's position taken in ontology, which is the study of being that asks *what is*, and in epistemology, which is the study of knowledge that asks *what it means to know* (Scotland, 2012). From an ontological point of view, pragmatism recognizes an interdependence between reality as it is and the interpretation of human experiences within; meanwhile, it takes the epistemological perspective that knowledge is interconnected with the one that knows and thus can be gained through examination of reality through a reflective circle of action and belief (Morgan, 2014). Grounded on philosophical discourses about learning (Dewey, 1938), pragmatism encompasses the concept of action learning (Revans, 1982) and the description of the design process as a reflective practice (Schon, 1983). These include a problem, an action, and a reflection component, which facilitates learning about the action itself and its content. In this study, the paradigm was applied by starting with a question, i.e., what do students need at the proposed space to find it attractive to make use of it, then seeking clarification through interaction with the users (i.e., students) in focus groups. This action led to the formation of new insights. Following a reflection moment, on what was learnt and on the approach that was used, these insights were incorporated into new hypotheses, e.g., students primarily want to work on their ideas and projects at the proposed space, which were tested again in interaction with the users, and so on, repeated in an iterative process. This is an open and inductive approach to qualitative research, by which new hypotheses are formed from action, reflection, and resulting identification of patterns in the empirical data (Creswell & Clark, 2004). This stands in contrast to deductive approaches, which test hypotheses formulated from a theory by collecting and analyzing empirical data, which either confirms or denies such hypotheses. Herein, an inductive approach was used to allow a wide exploration of user insights without previous limitations of the investigation to an established theory or predefined interpretation framework. This invited a broad diversion in the search for design criteria that would make the proposed space most likely attractive to UU students.

3.2 Research Approach

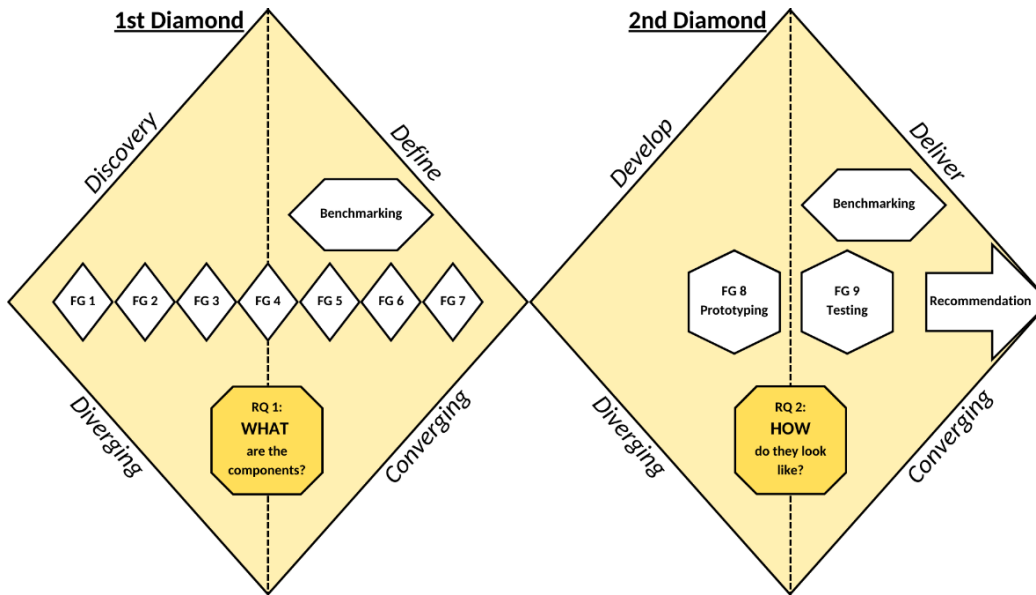
The research approach herein is inspired by Design Thinking (DT) and adapted to this specific study. DT emerged from the design community and evolved into a framework with associated toolkit applied for (business) innovation (Tschimmel, 2012). It provides a structured way of finding a solution for a problem. In this study, problem, i.e., low entrepreneurial student activity, and solution, i.e., a physical space, have been pre-defined by UtrechtCE. Therefore, the different phases of the DT approach (Dam, 2023) were applied instead to find design criteria for the proposed space. First, the designer, or

researcher, emphasized with UU students to develop a deep understanding of their needs for the proposed space. Second, these user insights were integrated to define the search for design criteria more clearly. Normally, third, potential solutions to the problem are ideated, fourth, one (or multiple) prototype(s) to the solution created and, fifth, tested with the users to evaluate the problem-solution fit, resulting in the refinement and improvement of the solution. Herein, these phases were adapted to ideate the realization of design components in the actual space, which also included prototyping and testing. Through high integration of user feedback in the design process, this approach is likely to generate a strong fit between the features of the physical space and the needs of its users. This may foster high user value, a crucial success factor for the space proposed by UtrechtCE.

In the DT domain, several process models have been developed and applied over the last two decades. Best known are IDEO's 3 I model (*Inspiration, Ideation, Implementation*) (Brown & Wyatt, 2010), IDEO's Human-Centered Design (HCD) toolkit (*Design Kit: The Human-Centered Design Toolkit | ideo.com*, n.d.), and the Double Diamond model from the British Design Council (*The Double Diamond - Design Council*, n.d.), which was chosen in this study. The Double Diamond model is visually based on a diagram depicting two sets of consecutive divergent and convergent phases (see Figure 3). These phases are characteristic for DT, which combines (diverging) phases of creating choices, e.g., empathizing phases or ideation, and (converging) phases of making choices in the design process, e.g., problem definition or prototyping/testing. Compared to the other DT models, the structure of the Double Diamond model aligns best with the two research questions that this study aims to answer. Each diamond focuses on the investigation of one research question. In the model, the first diamond consists of a *discovery* phase that aims to understand the problem by obtaining a wide array of insights related to the preliminary problem definition, and a *define* phase that uses the obtained insights to refine the problem definition. Herein, the first diamond contains the search for components that would make the proposed space most likely attractive to students (RQ 1). Subsequently, the second diamond includes a *develop* phase that aims to find potential solutions to the refined problem, and a *deliver* phase that results in selection and implementation of a solution after small-scale, iterative testing. Herein, the second diamond focuses on the realization of the identified components (RQ 2), including one round of prototyping and testing. The model allows for iteration particularly in the second diamond, which was not applied in this study due to timely constrictions. The first diamond has a linear structure compared to the second diamond, however, herein, it contained multiple rounds of discovery and definition that incrementally improved the understanding of the student needs. Through these iterations, insights from students of different study disciplines were integrated in the first diamond. This way, the target users were more accurately represented, considering that UtrechtCE is designing the proposed space as a university-wide offer to all students.

Figure 3

Application of the Double Diamond model in this study



3.3 Data Collection

The present study was conducted between September 2022 and January 2023. The main data was collected in nine focus groups with UU students as participants. The focus group method allowed simultaneous data collection from multiple students as well as interaction within each group (Bryman, 2016). This was beneficial to gather both individual views and consensus between students in each round of the data collection. Participants of the focus groups were approached by means of purposive sampling (Bryman, 2016). The inclusion criterion was that the participants had to be enrolled in a course at UU at the time of the data collection. To compare the insights obtained from UU students with practices elsewhere, benchmarking material of a sample of (inter)national innovation spaces was utilized in form of websites in the first diamond and field notes in the second diamond (Phillippi & Lauderdale, 2018). Benchmarking spaces were approached by means of purposive, partly snowball sampling (Bryman, 2016); this means that within the timeframe of this study, the researcher was receptive to suggestions about potentially interesting, other spaces from individuals that were informed about the subject of the study. The sampling of the benchmarking material herein did not set strict inclusion or exclusion criteria. The data collection procedures will be described in more detail in the following.

Focus Groups 1-7

In the first diamond, seven focus groups were used to answer the first research question (*“What are the components that would make the proposed space most likely attractive to students?”*). The focus

groups were conducted during class. The focus group sizes ranged between 6 and 94 participants, depending on the class size of an approached course. The classes were selected from a list of entrepreneurial courses published on the website of UtrechtCE. Therefore, the participants had been (at least to some extent) previously exposed to entrepreneurial concepts through the respective course content. Classes from bachelor and master programs of various faculties, i.e., Faculty of Science (BETA), Faculty of Geosciences (GEO), Faculty of Law, Economics, Governance and Organization (REBO), and Faculty of Humanities (HUM), as well as two classes that were open to students of all faculties, were approached to include participants with different study backgrounds in this study. Three different data collection tools were used: paper, the interactive presentation software wooclap.com, and audio recording. In line with the pragmatism research paradigm and methodological toolkit in the DT-inspired research approach, the use of the data collection tool per focus group was adjusted to the different type of inquiry at different times in the design process. While paper was used to facilitate a broad and individual ideation, wooclap.com was used to test previously obtained insights for preferences between different study backgrounds. Audio recording was used to collect detailed individual perspectives and reactions to other's arguments in an interactive discussion. While paper allowed free organization of words and drawings, wooclap.com restricted the answer choices in multiple-choice questions but allowed free formulation of answers in open-end questions, whereas audio recording allowed free speech and interaction of participants. Each of the focus group approaches was adapted to the previous one in consideration of the insights obtained and progress made in the design process. The number of focus groups was not determined upfront but over time with regards to the saturation of the insights obtained.

The first focus group (n=94; 2x 30 min) was held during a workshop on "Student Entrepreneurship" that had been organized by BETA for incoming master's students at the Graduate School of Natural Sciences (GSNS). There were two rounds of the workshop with different student groups as participants. First, the concept for the proposed space was introduced by description. The students were given the information that the proposed space would be the size of around 500m², otherwise they were encouraged to imagine the offer as freely as possible. After the introduction, they were asked to answer four questions about the proposed space on paper. These questions had been previously formulated by the researcher to gain knowledge on the components required to make the space most likely attractive to students, such as people, purpose, and facilities. Additionally, participants in focus groups 1-7 were asked why they would not make use of the space. To ensure that responses were not steered, no rewards for participation or certain answers were provided. The participants' imagination was encouraged by few oral impulses given by the researcher, e.g., "Do you see plants in the space, for example?". After answering the questions, the participants were asked to rank their likeliness to make use of *The Playground* (as they imaged it) on a scale from 1 to 5 (1 = won't come; 5 = will come).

If interested in a follow-up of the project, they were asked to provide their contact (name and email address). The ranking and question for follow-up contacts were included in focus groups 1-7. 94 paper forms were collected and numbered. Two paper forms were discarded because they did not contain answers to the questions but unrelated drawings.

The second focus group (n=34; 15 min) was held during the course “Innovation Strategies of Firms and Entrepreneurs” with bachelor’s students at GEO. This time, the concept introduction included a 1-minute video clip that had been produced by the researcher and UtrechtCE with the help of a video producer, originally with the aim to pitch the concept of *The Playground* to UU teachers. It was used in all subsequent focus groups to make the space more tangible to the participants because it showed footage of the current space. After seeing the video clip, participants were asked to answer a set of questions on wooclap.com that had been developed by the researcher based on the most prevalent codes and (sub)categories of the code book version one. A predefined set of answer choices was provided with each multiple-choice question. Multiple answers could be selected to identify preferences within each question. The answer choices were formulated by the researcher based on the most prevalent codes found within each category in the first focus group. Each multiple-choice question was accompanied by an open-end question that allowed students to add one or more free-text answers. As for all focus groups that used wooclap.com as the data collection tool (focus groups 2-5), results were derived from wooclap.com in Excel sheets.

The third focus group (n=27; 15 min) was held during the course “Bioinspiration & Value Creation” with master’s students at BETA in the program “Bio-Inspired Innovation”. After the concept introduction, participants were asked to answer a wooclap.com questionnaire that probed the ‘work’-related categories in the emerged ‘purpose’ theme from the current code book version for preferences. Within each of the tested categories, i.e., ‘work’, ‘connect’, and ‘learn’, participants could choose from a set of answer choices that were most prevalently found in both focus groups before. Additionally, students were asked open-end questions about ‘expertise’ and ‘atmosphere’ (categories that had emerged in the ‘requirements’ theme).

The fourth focus group (n=17; 15 min) was held during the course “Writing as Entrepreneurship” with master’s students at HUM. After the concept introduction, participants were asked to answer a wooclap.com questionnaire that probed the ‘work’-related categories in the ‘purpose’ theme, followed by open-end questions on preferred activities, the category ‘expertise’, and other aspects, such as wording, people, atmosphere, and incentive, that would make the proposed space most likely attractive to the participants.

The fifth focus group (n=17; 15 min) was held during the course “Sustainable Entrepreneurship and Development” with master’s students at REBO. The procedure was identical to the third focus group to allow direct comparison of findings between the two student samples of the different faculties BETA and REBO.

The sixth focus group (n=6; 30 min) was held during the course “Living Past” with students from various faculties. It included two high school students that were enrolled in the course at that time. It differed from previous focus groups in the data collection tool, i.e., audio recording, and technique, i.e., moderated discussion with the participants. Here, the concept introduction additionally included a short presentation of the findings from the previous focus groups to induce a reaction of the participants to previous participants’ preferences for design components. The subsequent discussion was moderated according to two leading questions that probed the ‘work’ category in the ‘purpose’ theme in both curricular and extracurricular direction. By repeatedly asking “why?” questions, the researchers tried to find the underlying reasons for the participants’ arguments (Serrat & Serrat, 2017).

The seventh focus group (n=48; 2x 15 min) was held during the course “Essentials of Entrepreneurship” with students from various faculties. There were two rounds of the class with different student groups as participants. The procedure was identical to the sixth focus group to collect comparable data.

Focus Groups 8-9

In the second diamond, two focus groups, one for the purpose of prototyping and one for the purpose of testing, were used to answer the second research question (*“How are these components realized in the actual space?”*). The reason to include UU students in the prototyping process was two-fold. First, it allowed incorporation of multiple user perspectives instead of solely the researcher’s perspective, which increased the objectivity and transparency of the prototyping. Second, it enabled the collection of additional qualitative data from UU students. The participants of both prototyping and testing focus groups were selected from the 87 follow-up contacts that were recorded in the focus groups 1-7 in the first diamond. A Google Form invitation that had been prepared by the researcher was distributed to all follow-up contacts via email. Additionally, the Google Form invitation was distributed to personal contacts of the researcher and of her colleagues at UtrechtCE via Instagram and WhatsApp. The wide distribution of the invitation was done to compensate for ‘no-shows’ (Bryman, 2016). The focus groups were conducted with the students that responded to the invitation at the actual space on the Utrecht Science Park (Vening Meinesz Gebouw C, room 0.20) to immerse the participants in the space for which the design criteria were investigated. Upon their arrival, participants were introduced to the task of the session with a prepared flip chart poster (see Appendix D). The task description included the categories of the ‘purpose’ theme that had emerged in the focus groups 1-7 in the first diamond.

In the eight focus group (n=6; min 1h), digital prototypes of the proposed space were created by the participants using Pinterest.com. They were asked to visualize the proposed offer, with regards to overall atmosphere, decoration, furniture, and people in action, by adding images from the internet to their individually assigned, empty Pinterest boards. They were asked to motivate their choice by adding a note to an image. This way, implicitly, the participants were engaged in parallel prototyping, which serves the purpose of exploration and led to the embodiment of multiple design concepts during the prototyping (Camburn et al., 2017).

In the ninth focus group (n=4; min 1h) the images of the six Pinterest boards were compiled on Miro.com and presented to the participants. Each participant was assigned to one frame within the Miro board that contained the same image compilation per frame. The participants were asked to react to the digital prototype individually, i.e., to agree or disagree with the presented images by moving them to a prepared 'yes' or 'no' column. They were asked to motivate their choices by adding a note to an image or a group of images. Moreover, they were invited to add images of what they considered missing in the presented prototype.

In both focus groups, after 20-30 minutes of working on their task individually, each participant had to present to the others and explain their reasoning behind their choices in a 2-minute pitch. Afterwards, the participants were invited to give each other feedback, to interact, and to discuss similarities and differences in their arguments, why they had chosen certain components and why their look had been appealing to them. During the pitches and discussion, notes were taken by the researcher and a researcher's colleague from UtrechtCE that was also present at the respective focus group. To ensure that the responses of the participants were not steered, wording of the introduction and the task description was intentionally kept vague, e.g., "Visualize the space in terms of 'furniture' and 'decorations'" instead of "Are there any plants?". Help was offered only for technical difficulties. In both sessions, technical unfamiliarity of the participants with the used web applications, i.e., Pinterest.com and Miro.com, were noted.

Benchmarking Material

To complement the focus group findings, benchmarking material from a selection of nine Dutch and one Swiss innovation space was utilized (see Appendix A). The innovation spaces that were considered had been suggested to the researcher by UtrechtCE and their professional networks, i.e., interested UU students and employees, upon hearing about the subject of this study. Thus, the selection consisted mainly of university-associated innovation spaces in the Netherlands. The Swiss innovation space was included to allow to consider to some extent the effect of cultural differences on components that made the innovation spaces attractive to their local students.

In the first diamond, each website of the sampled innovation spaces was scanned with regards to the activities that they provide. In the second diamond, three spaces (i.e., TU/e innoSpace, Twente DesignLab, and ETH SPH) were visited by the researcher in-person. At each space, field notes were taken during the tour and conversations with operational staff and student members of the space.

3.4 Data Analysis

The data collected from the focus groups was analyzed using qualitative content analysis, “a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns” (Hsieh & Shannon, 2005). Adapted from methodological indications (Moretti et al., 2011; Vaismoradi et al., 2016), the data herein was analyzed from the expression of participants in text and word through a first level of open coding, resulting in codes that were subsequently grouped into sub-categories (second level of the coding process) and categories (third level of the coding process). Themes, then, emerged from the identified categories (fourth level of the coding process). Notably, the focus in the analysis of the focus groups was attached to the individual perspectives rather than on the interaction between the participants. The coding process is described in more detail in the following.

Focus Groups 1-5

Open coding was done manually after the first focus group by writing all codes identified in the paper forms onto a mind map on a flipchart pad. Whenever codes were named by multiple participants, their paper form number was noted at the corresponding code. In the same step, the codes were grouped in the mind map according to the questions asked to the participants, for example, people that students wanted to meet at the proposed space. This process was intermittently checked by the researcher’s supervisor Rianne Poot, who has over six years of experience in qualitative data analysis through her education in social sciences. In the next step, the codes were transferred from the flipchart pad into a Word table, where they were organized into categories and sub-categories. Additionally, the number of participants that had mentioned each code was counted. This resulted in code book version one, which upon finalization, was reviewed and approved by the researcher’s supervisor. The codes obtained from the second focus group were added to the code book version one. With some timely distance, the categories were reviewed again, adjusted as appropriate, and grouped into overarching themes. This led to code book version two. The validity of code book version two was affirmed by Daan Pisa, a student assistant at UtrechtCE, who has 4.5 years of experience in qualitative data analysis through his education in innovation management. He reviewed code book version two independently from the researcher. From his feedback, certain codes, sub-categories, and categories of code book version two were renamed and reorganized. The integration of his feedback resulted in code book version three. Afterwards, new codes obtained from each of the following focus groups

were added to each current code book version. This led to code book version four after the third focus group, code book version five after the fourth focus group, and code book version six after the fifth focus group. When categories and themes had remained unchanged for three subsequent rounds of data collection and analysis (since the externally validated code book version three), data saturation was claimed after the fifth focus group, upon consultation of UtrechtCE.

Focus Groups 6-7

The audio recordings of the sixth and seventh focus group were transcribed on Microsoft 365. Due to a lack of differentiated discussion during both focus groups, the collected data was not coded but summarized each into a visual mind map on a whiteboard. Unfortunately, the quality of the audio recording of the seventh focus group was relatively bad due to the size of the group (n=48) and of the classroom. The obtained visual mind maps were used to refine the findings of the focus groups 1-5.

Focus Groups 8-9

The data collected during the focus groups for prototyping and testing purposes was not analyzed according to qualitative content analysis but described manually by the researcher after discussion and comparison of her notes with the notes of the UtrechtCE colleague that had been present at the respective focus group.

Benchmarking Material

The benchmarking material was analyzed per diamond through manual comparison to the findings obtained from the respective focus groups with UU students. In case of one Dutch innovation space (TU/e innoSpace), the researcher's field notes were compared with the field notes of UtrechtCE colleagues that had also been present at the respective visit.

4. Findings

First, the findings of all focus groups in the first diamond will be described chronologically to illustrate the incremental and iterative research process of this study. Subsequently, the findings will be summarized to answer the first research question, regarding the components that would make the proposed space most likely attractive to students. The identified components will then be compared to practices found at other (inter)national innovation spaces. Second, it will be described how the identified components could be realized in the actual space, answering the second research question. This part will present the findings of the focus groups for prototyping and testing purposes, after which the findings will be compared again with the selected (inter)national innovation spaces.

4.1 First Diamond

Focus Group 1

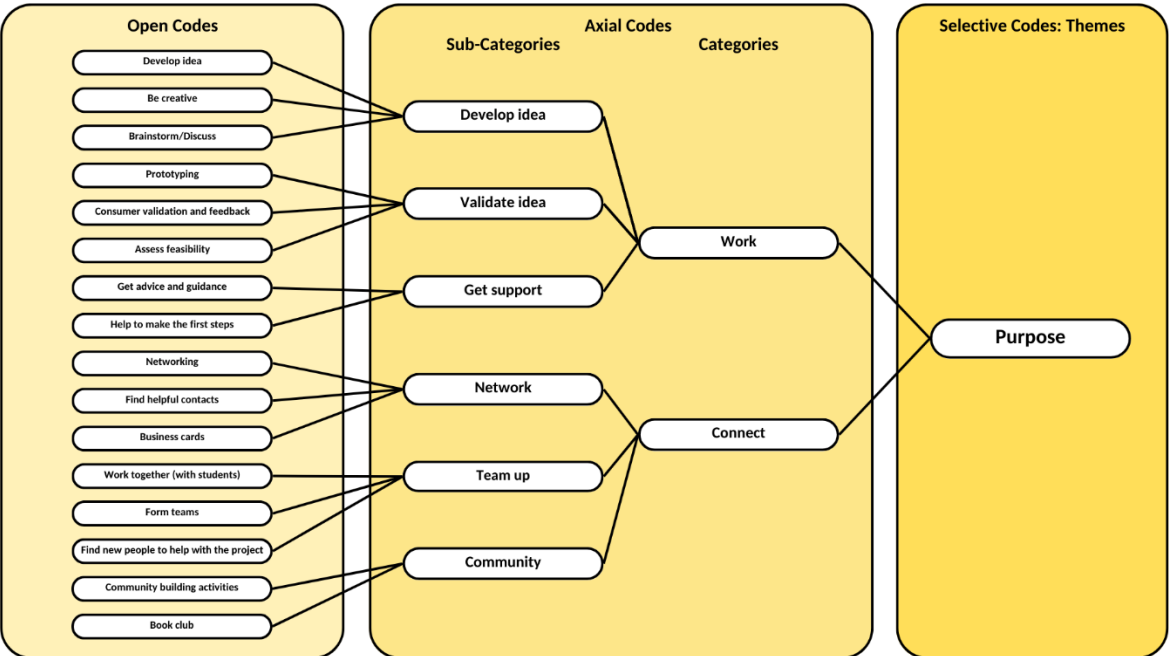
The first focus group was held to get a first impression of the needs of students and their reaction to the proposed space. The feedback of the 94 participants resulted in a first code book, with the identification of 238 open codes, from which 40 sub-categories and 11 categories were derived in a defined coding process (see Figure 4). Three themes emerged from this focus group: 'purpose', 'requirements', and 'reasons for failure'. These themes were confirmed and supplemented with new codes in later focus groups. After the first focus group, the theme 'purpose' encompassed the participants' motivation to use the proposed space for learning, connecting, inspiration, exploring ideas, and recharging. To do so, they indicated that they would require certain tools, people, spatial design, and a distinct atmosphere. They were less likely to make use of the proposed space in case its general settings, facilities, social and working atmosphere did not match their preferences. Additionally, they would not use the space if they would not see the added value, were lacking motivation, did not feel ready or were afraid. The likeliness of coming to the proposed space was scored with an average of 3.5 (scale: 1-5). 47 interested follow-up contacts were recorded.

Focus Group 2

The second focus group aimed to test the insights obtained from the first focus group for reoccurrence and additions of codes. The first code book was expanded by 23 new open codes, e.g., 'share ideas', that were allocated in existing sub-categories, e.g., 'work together', and categories, e.g., 'connect', following the defined steps of the herein applied coding process (see Figure 4). This resulted in a second code book, which, subsequently, was transformed to the third code book version through feedback integration upon review from the researcher's colleague. When asked what the participants wanted to do at the proposed space, each provided answer choice (see Appendix B) received over 50%

votes⁹. The three most wanted activities were “learn from experienced people” (73%), “work on own project” (65%), and “networking” (62%). When asked what they needed for that, 88% votes were given for a “good atmosphere”. Whiteboards (81%) and screens/monitors (65%) were favored to power tools (23%). The availability of workspaces (62%) and meeting rooms (42%) was also relevant to the participants. When asked for people needed to make use of the proposed space, other students that were interested in entrepreneurship were most requested (79%). All other answer choices received around 50% votes. Most participants would not make use of the offer, if it was seen as too formal or with obligations (63%), or if they had no time (46%). The likeliness of coming to the proposed space was scored with an average of 3.1 (scale: 1-5). 8 interested follow-up contacts were recorded.

Figure 4
Illustration of the coding process



Focus Group 3

The third focus group aimed to test the code saturation of the third code book as well as preferences for some components over others. Additionally, it probed for details in the ‘expertise’ and ‘atmosphere’ categories, i.e., what defines a good atmosphere (see Figure 5). When given the choice between the

⁹ During the data collection, factors independent from the researcher, for example, the spatial setting and the time of the day, at which the focus group was held, seemed to have an influence on the student engagement. To normalize for engagement, the selection of an answer choice given during the wooclap.com questionnaires was considered as the percentage of the number of clicks relative to the total number of active participants at the respective question on wooclap.com.

three 'purpose' categories 'learn', 'work', and 'connect', participants responded that they mostly wanted to use the space to work (78%), then, to connect (57%), and the least, to learn (30%). When asked how they wanted to learn at the proposed space, the vast majority of participants wanted to learn by doing (91%), followed by listening to a guest talk (57%). Having a 1on1 conversation (43%) and seeing a hall of fame/failure (35%) were also chosen as ways to learn at the space. No participant wanted to learn there by reading a book or story and only three participants wanted to learn by following a lecture (13%). When asked how they wanted to work on their idea or project, most participants preferred to work in groups (83%) instead of individually (17%). Prototyping (74%), regular feedback (74%), and user validation (70%) seemed highly relevant to many participants. Half of the participants agreed to idea presentation as a work component at the space. When asked how they wanted to connect at the space, they mainly liked workshops (88%), followed by programs (67%) and events (54%). They would also connect with other participants by simply being at the space (42%) or by participating in a hackathon (29%). Meeting 1on1 (17%) was the least preferred way to connect with people at the space among the provided answer choices (see Appendix B). With regards to expertise, the participants mentioned a variety of knowledge that would be beneficial to the development of their idea or project. Three new sub-categories in the category 'expertise' were formed from these responses: 'idea-related', e.g., "bioinformatics", 'action-related', e.g., "marketing", and 'entrepreneurial mindset-related' expertise, e.g., "design". Similarly, based on the provided answers (see Figure 5), the category 'atmosphere' was divided in nine new sub-categories. This way, the third code book was expanded to a fourth code book version. For the participants in this focus group, the main reasons not to make use of the proposed space were if there was an unfavored working (67%) or social (50%) atmosphere (see Table 1). This finding highlights the importance of the right atmosphere at the proposed space to make it attractive to students. The likeliness of making use of the space was scored with an average of 3.3 (scale: 1-5). 20 interested follow-up contacts were recorded.

Figure 5

The ideal atmosphere at The Playground (according to participants in focus group 3)



Focus Group 4

The study background of the participants in the fourth focus group differed substantially to the one of the participants in the focus groups 1-3. Therefore, this focus group was conducted to compare the preferences for the proposed space between students in the discipline of humanities to (natural) sciences. Identical to the focus group before, most participants ranked the purpose of their visit at the space from highest to lowest, to work (69%), to connect (46%), and to learn (15%) (see Figure 6). They specified that they would like to attend workshops and work on authorship-related tasks at the space. Favored knowledge fit in the sub-categories of 'expertise': 'idea-related', e.g., "writing" and "editing", 'action-related', e.g., "marketing", and 'entrepreneurial mindset-related', e.g., "creativity". Answers provided on what would make the proposed space attractive to the participants overlapped with previous data. In contrast to the third focus group, herein the main reasons not to make use of the proposed space were that participants were not motivated (62%), did not see the added value (38%), and did not feel ready (23%) (see Table 1). The likeliness of coming to the proposed space was scored with an average of 1.6 (scale: 1-5). No interested follow-up contacts were recorded among the students, however, the teachers of the course in which the focus group was held voiced their interest in a follow-up of the project. This focus group revealed a lower interest of this sample of humanities students in the proposed space. To make the proposed space still likely attractive to humanities students, particular events on their topics of interest could be organized at the proposed space, for example, a workshop about marketing for writers.

Focus Group 5

The fifth focus group aimed to confirm the validity of the code book version at that time. It used the identical questionnaire to the third focus group to enable a direct comparison between the answers of life sciences to economics students. It revealed similar, yet nuanced preferences of these participants compared to participants of the third focus group. Identical to participants of the two focus groups before, most participants in this group wanted to use the proposed space to work (78%), then, to connect (67%), and the least, to learn (28%) (see Figure 6). When asked how they wanted to learn at the proposed space, the participants selected amongst the answer choices (see Appendix B) in the same order than the participants in the third focus group. In short, they wanted to learn mostly by doing (94%), by listening to a guest talk (72%), and by having 1on1 conversations (72%). There were slight differences to the third focus group in how the participants herein wanted to work on their idea or project. Most participants valued getting regular feedback (82%) and testing their idea with a user (82%). The preferred work mode was in groups (59%), in contrast by oneself (12%). Prototyping (47%) and presenting ideas (41%) were chosen as well. When asked in which ways they wanted to connect with others at the space, the three most prominent answers were, identical to the third focus group:

workshops (84%), programs (68%), and events (53%). Hackathons (11%) were visibly less popular among the participants in this student sample compared to the third focus group. Requested expertise, e.g., “financial advice”, and atmosphere, e.g., “collaborating”, were in line with previous data. Interestingly, the main reason for these participants not to make use of the proposed space was that they did not feel ready (53%), followed by an unfavored social (29%) and working (24%) atmosphere (see Table 1). The likeliness of coming to the proposed space was scored with an average of 3.1 (scale: 1-5). 11 interested follow-up contacts were recorded.

Figure 6

Focus groups (FG) 3-5: What do you want to do at The Playground?

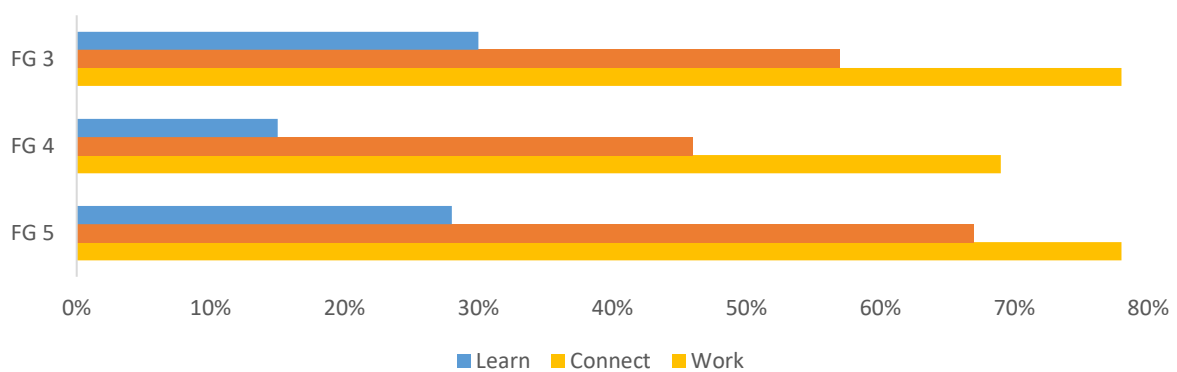


Table 1

Focus groups (FG) 3-5: Top 3 reasons not to make use of The Playground

	FG 3 (BETA)	FG 4 (HUM)	FG 5 (REBO)
1	Working atmosphere	Not motivated	Not ready
2	Social atmosphere	No added value	Social atmosphere
3	Afraid	Not ready	Working atmosphere

Focus Group 6

The sixth focus group aimed to investigate the most prevalent category in the ‘purpose’ theme: ‘work’. A moderated and interactive focus group discussion was held to understand what students meant when they said that they wanted to work at the proposed space. ‘Work’ for the participants of this focus group meant working on tasks, discussion, and distribution of tasks in their group during course time and working on individual tasks at home. Feedback on the project progress from classmates and the course instructors took place in the classroom. Three different work modes could be distinguished for the classroom: group work, individual work, and collective discussion of all course members. During the course time, students made use of the modifiable spatial setup at one of the innovative teaching environments at UU, i.e., with movable desks and chairs, a whiteboard for brainstorming and a screen for presentations, as well as a second room for breakout sessions. When participants wanted to

recharge, the classroom and hallways were used for walks and getting coffee or tea. The final project presentations were held at the target location of the project, which, in this specific case, was Utrecht's Lombok neighborhood. During and after the course, the proposed space would be used by students for group work. Importantly, one participant noted the need for a sense of direction in the idea or project when taking it to the proposed space to work on it there. This sense of direction could have been formed during the course, for example, in the classroom. Group work at the proposed space would need a spatial division to reduce distraction. Inspiration for these students meant that they could listen to a guest talk or meet other like-minded students beside their group either at a designated space in the proposed space or in the classroom. What students missed at the current teaching location was a nearby space designed to be used to recharge, for example, with plants and comfortable seating options. Moreover, they missed the possibility of a bookable space to invite guests to test and present their idea to. The likeliness of making use of the proposed space was scored with an average of 3 (scale: 1-5). Half of the group was interested in a follow-up.

Focus Group 7

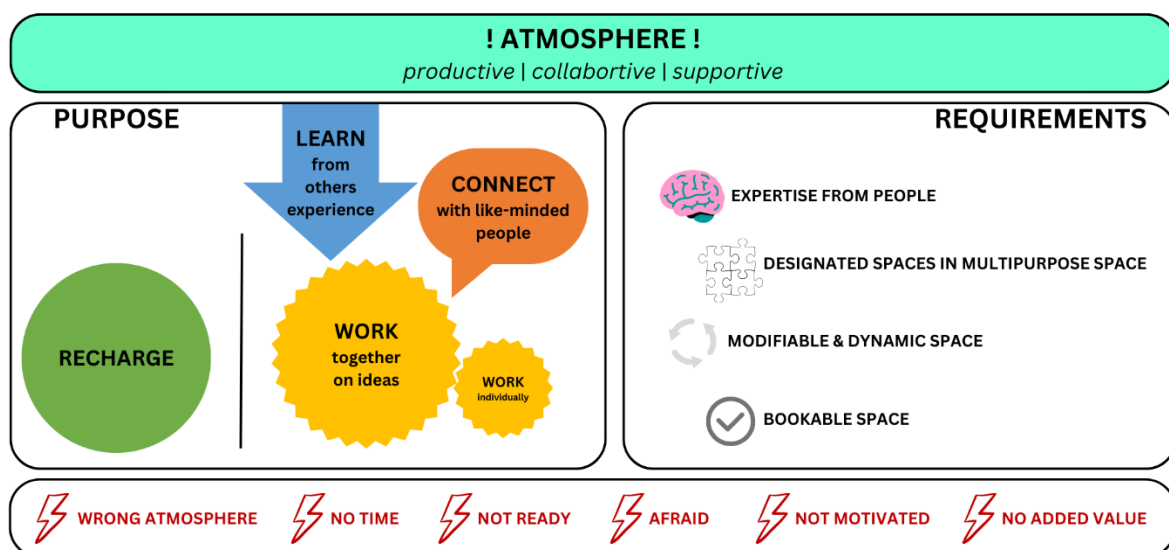
The seventh focus group aimed to test the insights in 'work' at the proposed space from the sixth focus group with a different student sample. In short, the insights in the 'work' category from both focus groups overlapped. Two work modes outside of the classroom were named: discussion with the group, mainly in virtual meetings, and individual work on defined tasks. In the first sample group, six out of seven groups had met their group members online, in the second sample group, half of the groups had met online. The main reason for meeting their group in person was mentioned as enhanced productivity. The main reasons for meeting online were busy and different schedules of group members and the benefit of saving time. During the course, the proposed space would be used by students before lectures or tutorials to discuss the project progress, but only if the lecture or tutorial would be subsequently held at the space (reasoned by convenience). After the course, the proposed space would be used by students to get support and to be able to ask questions to experts and experienced, entrepreneurial people in different fields, or to other groups. One participant suggested spatial division between closed, quiet workspaces and open, interactive spaces for talking with others, creative work, and inspiration. It seemed that distraction was less of a problem for these students when they anticipated a certain working atmosphere. What students missed in the current course setup was the exchange between groups. Additionally, they agreed that the proposed space could offer them a place to engage in user validation of their idea. Overall, only two out of twelve groups considered a continuation of their entrepreneurial project after the course. The likeliness of making use of The Playground was scored with an average of 2.4. It was not asked for a follow-up.

Summary Focus Groups 1-7

Taken together (see Figure 7), the main components that would make the proposed space most likely attractive to students are its spatial facilitation of the purpose of working, connecting, learning, and recharging, the presence of certain people and expertise, and a distinct atmosphere. In other words, students want the proposed space to be a place in which they can work together with other, like-minded students on their ideas and projects, receive input from more experienced or knowledgeable people to enable them to do so, and take breaks from work in a designated recharging space. Working together on projects was found to be a dynamic process with different work modes, for example, group discussion and individual task completion, thus it needs dynamic space. Such modifiable but designated, visually distinguishable spaces, e.g., working spaces, collaboration spaces, event spaces, and recharging spaces, seem inevitable for the creation of a multipurpose space, as envisioned by UtrechtCE. Currently missing in the innovative teaching environment at UU is the colocation of designated working and recharging spaces, which has the potential to increase work productivity through breaks in a different and inspiring environment. Additionally, bookable space to invite (external) guests, particularly, for user validation, would enhance the unique benefit of the proposed space. The atmosphere at the space plays an important role in the attractiveness of the offer for students. They value a productive but informal, supportive, open-minded, and collaborative atmosphere. Also, having a prior direction for an idea or project (e.g., through a course assignment) could be helpful for the navigation of the new environment.

Figure 7

Visual summary of the findings from focus groups 1-7 in the first diamond



For the development of the proposed space, there are several important reasons to consider that would make the proposed space unattractive to students. Some of them are tightly connected with the previously described components. For example, the right atmosphere is so important to students that they are unlikely to use the space if they do not like the working or social atmosphere there. Some simply did not see the added value of the space. Other reasons not to come are related to the students' life (e.g., not enough extracurricular time, other interests, or unpreferred location) or mindset (e.g., not feeling ready, being afraid of failure and/or judgement, or lacking motivation).

Benchmarking (First Diamond)

Nine Dutch and one Swiss innovation space were reviewed for their activities and compared to the findings from the focus groups 1-7. The activities at the other innovation spaces were varied, depending on the aim of the respective space and its embedding in the local entrepreneurial ecosystem. The functions ranged from pre-incubation (e.g., Impact Studio), pre-incubation and incubation (e.g., ETH SPH), to incubation (e.g., VU StartHub), and differed from hosting explicitly extracurricular (e.g., ETH SPH) to extra- and curricular entrepreneurial student activities (e.g., TU/e innoSpace).

Common activities include co-working, coaching, prototyping, workshops, and other events. Co-working is offered primarily in open spaces (e.g., ETH SPH) as well as primarily in closed spaces, such as meeting rooms or offices (e.g., VU StartHub). Coaching is often facilitated through an expert pool, which students get access to upon registration. Registration of student projects is an element that was hardly found in the focus groups but in the selected innovation spaces, except for BK-Launch and Twente DesignLab. In ETH SPH and TU/e innoSpace, for example, student ideas required approval in an evaluation process, upon which the students receive access to the facilities and coaching opportunities. In case of ETH SPH, personal coaching is offered per registered student project by one allocated coach. Impact Studio mentions customized coaching as part of their pre-incubator program. Some spaces have specialized (light to heavy) prototyping facilities, including power tools, such as 3D printers (e.g., ETH SPH or TU/e innoSpace), others offer prototyping with scraping materials, such as post-its and cardboard (e.g., BK-Launch), or refer to the partnered prototyping facilities (e.g., Demonstrator Lab). Workshops are held at many innovation spaces and are in line with the mindset to 'learn by doing', also found in the focus groups with UU students. Events are more prominent at some spaces (e.g., ETH SPH, TU/e innoSpace, VU StartHub, PLNT) than at others, that are set up primarily as a guided program to registered students (e.g., Demonstrator Lab, HKU X or Impact Studio).

When compared to the focus groups with UU students, the selected innovation spaces mainly overlap with the 'work' and 'connect' categories. 'Learn' (from others) as the purpose to use a space is not a priority at the benchmarking spaces and for the participants in the focus groups alike. 'Get funding'

was mentioned by UU students and is offered by some innovation spaces upon application (e.g., ETH SPH or Demonstrator Lab). The importance of the collocation of work and recharging spaces, found in the focus groups, was not explicitly seen at the other innovation spaces. 'Recharge', however, is often an element at these spaces, for example, in designated "chill areas" (e.g., TU/e innoSpace). Overall, the common thread throughout the innovation spaces was the community aspect of like-minded individuals that is facilitated at each space.

4.2 Second Diamond

Focus Group 8 (Prototyping)

Six Pinterest boards were generated from the six participants in the prototyping group (one Pinterest board per person). The number of images in each board ranged from 1 to 34 (average: 14.2). Most participants selected the images with regards to the depicted activities and their purpose in the space. One participant created multiple Pinterest boards according to different activities. Another participant drew activities on the presented floor plan for the proposed space, instead of picking images. Various components were identified in the selected images with the involvement of the explanatory notes (see Table 2). All components were agreed with by the other participants during the discussion, particularly after hearing the motivation behind the selection. The 78 compiled images formed a first digital prototype that visualized how the various components found in the focus groups could be realized in the proposed space. The components are described in more detail in the following.

Nearly all participants (n=5) included writable surfaces, like free-standing whiteboards or writable walls, and a pantry or coffee and tea supply. The area of the pantry was associated with different activities by different participants which ranged from drinking a coffee or tea, meeting, connecting, and talking with other people, to taking a break from work. Most participants (n=4) depicted plants as well as spaciousness or open space, which often showed a variety of different seating formations, for example, round and square tables, or different chairs and couches. Explicitly addressed by half of the participants (n=3) were opportunities for recharging, visualized in images of ping pong tables and bean bags, and open spaces with personal desks and monitors for individual work. One participant reasoned that seeing other people work during individual work motivates oneself to keep working, to which the other participants agreed. Importantly, the recharging opportunities had to be audio visually separated from the working areas. Two participants included a stage element in their boards, to share ideas and to ask for feedback from the audience, as well as infrastructure that allows users to build specific products, e.g., a work bench for wood working. All participants agreed that they wanted to know what was happening at the proposed space when being at the space. This could be facilitated by a central project information board, mentioned by two participants, or shared event calendar, mentioned by one participant. Two participants included movable furniture and separate, potentially bookable

rooms, in which people could meet privately or use the room's equipment, e.g., microphone for the purpose of recording a podcast. Also depicted by two participants was the element of movement or walking. One participant reasoned that emotions and movement would help create ideas, thus should be facilitated at the space. The same participant noted that the space could use posters or equipment as brain teasers to stimulate ideas. Moreover, one participant described the connection between type of seating arrangement to type of conversation being held, e.g., seating in a circle was argued to lead to informal conversation and quick exchange of ideas. Audio visually separated, closed group spaces with a table, chairs or bench, and screen that could be connected to a personal laptop, were explicitly mentioned by one participant but agreed with by the other participants during the open discussion. One participant included a storage shelf as well as a product shop, in which student-made products could be sold. The same participant included an image of a 1on1 meeting used to ask questions to an expert in her board. Lastly, the use of warm light, as opposed to bright LED light, which was negatively associated with corporate office space by all participants, was named to create the right atmosphere at the space.

Overall, participants emphasized the importance of a spatial division between work and work breaks. All participants highlighted the ability to connect and have conversations as the main reason to come to the space. They agreed that the proposed space should feel different from other space at the university. Interestingly, they voiced difficulties to visualize the 'learn' category. This could have been due to their association of learning with lecture-type education as well as a focus on learning by doing, which was visualized in images, for example, of a working bench. In the discussion, it was found that a clearly defined and shared mindset with associated values had to be at the core of the space and its community. The key takeaway of the prototyping was that the design of the space sets the stage for the contained activities, hence the overall look and feel of the proposed space must reflect its purpose to be attractive to UU students.

Focus Group 9 (Testing)

To test the components of the created digital prototype with interested UU students ("testers"), the 78 images were compiled and presented on a Miro board to each of the four participants of the testing group. They were asked to agree or disagree with each provided image and motivate their choice (see Table 2). Moreover, they were invited to add images to the image collection that depict elements that were missing in their opinion.

Table 2

Prototyping/Testing

Prototype Creation Session - Components	n	Tester 1	Tester 2	Tester 3	Tester 4
<i>Writable surfaces</i>	5	✓	✓	✓	✓
<i>Pantry</i>	5	✓	n.a.	n.a.	✓
<i>Plants</i>	4	✓	n.a.	n.a.	✓
<i>Spaciousness/open space</i>	4	✓	n.a.	n.a.	✓
<i>Opportunities for recharging</i>	3	✓	✓	n.a.	✓
<i>Personal desks and monitors</i>	3	✓	✓	✓	✓
<i>Stage</i>	2	✓	n.a.	n.a.	n.a.
<i>Build area</i>	2	n.a.	n.a.	n.a.	n.a.
<i>Project information board</i>	2	✓	n.a.	n.a.	✓
<i>Movable furniture</i>	2	✓	n.a.	n.a.	n.a.
<i>Separate rooms</i>	2	✓	✓	n.a.	✓
<i>Movement/walking</i>	2	n.a.	✓	n.a.	n.a.
<i>Closed group space</i>	1	✓	✓	n.a.	✓
<i>Warm light</i>	1	✓	n.a.	n.a.	n.a.
<i>Storage</i>	1	n.a.	✓	n.a.	n.a.
<i>Product shop</i>	1	n.a.	n.a.	n.a.	n.a.
<i>Event calendar</i>	1	✓	✓	n.a.	✓
<i>Asking opportunities</i>	1	n.a.	n.a.	n.a.	n.a.
<i>Brain teaser</i>	1	n.a.	n.a.	n.a.	n.a.
Prototype Testing Session - Additions					
<i>Standing desks</i>	2	✓	✓	n.a.	n.a.
<i>Multiple monitor setup</i>	1	n.a.	✓	n.a.	n.a.
<i>Charging ports</i>	1	n.a.	✓	n.a.	n.a.

All participants agreed to a space designated for working, equipped with desks, chairs, and monitors, both for group and for individual work, a space, which invites collaboration within a group of 4-6 people, with whiteboards, projectors, or a screen, potentially in a closed space or separate (bookable) room, a space with recharging opportunities, coffee or tea, and comfortable seating, and an event space, potentially with a stage. Information boards and weekly planners, for projects and events, were perceived very well. Participants emphasized that they wanted to be productive in the space, hence they required a distinct audiovisual separation between working and recharging space, as well as seating at the working space that was deemed comfortable enough for working but not too comfortable to relax there. Highest priority had group work and writable surfaces. The colors green, i.e., plants, and brown, i.e., wooden interior, were favored over white and grey, which were negatively associated with corporate environments. Accordingly, the main critic was given when images were perceived as “too corporate” or, in contrast, “too playful”. Warm light was closer associated with recharging than with working. The reduction of noise and clutter, seen as distractions, at the working spaces was very important to all participants.

The participants added images of standing desks at the working space, modular seating options in the event space, charging ports, a desk with multiple monitors where they could connect their device, and a setup with different devices to test software applications.

After the focus group for testing purposes that was described above, an additional opportunity had occurred to test the digital prototype with UU students. The researcher represented UtrechtCE in front of a class of students enrolled in the Science and Business Management master's program at BETA during the course "Science-based Entrepreneurship". On this occasion, she asked the students for their feedback on the proposed space. The students were presented with a selection of images from the prototyping group that were combined by the researcher to visualize the key components of the prototype. The students liked the creative look of it, e.g., the ping pong table. Also appreciated were the presence of peers and like-minded people and a workbench for building things. Overall, most students liked the design of the space as it was presented to them. When discussing opportunities to improve the proposed space, students raised the question of registration at the space and noted the challenge of attracting the right crowd. As a potential solution to this challenge, one student proposed that involved students could become volunteers at the space to strengthen the like-mindedness and community of its users. With regards to the 'learn' category, one student requested access to expert knowledge, to which another student suggested that seminars and personal meetings with experts could be held at the space. A mentorship program with registration barrier was suggested to solve the challenge of access to expert knowledge. To share the knowledge within the community was also suggested. Community events could intentionally bring students with different study backgrounds together for interdisciplinary collaboration.

Summary Focus Groups 8-9 (Prototyping and Testing)

Taken together, the components of the proposed space, i.e., 'work', 'connect', 'learn', and 'recharge', were visualized at the actual space in terms of use of space, interior and decoration.

Different work modes could be realized in designated open and closed spaces. While individual work seemed to benefit from personal desks (optional: standing desks) with monitors in an open space, group work was visualized both in open space with writable surfaces for ideation purposes and in closed space with a presentation screen for focused work and discussion. Closed space either meant separate rooms, which then could be bookable, or audio visually separated "meeting cubicles". Crucial elements were writable surfaces and the idea that one wants to know what is going on in the space while being there, which could be realized through a project information board and event calendar. There were also different modes for recharging, from drinking a coffee or tea in a café-like area, which could also be used for 'connect' purposes with informal meetings, to active games like ping pong. Additional elements were plants, an event area with modifiable furniture and a stage, and a

prototyping area¹⁰. Learning was not explicitly addressed by the participants. They emphasized the right balance between openness and privacy, professionalism and informality, and comfortability. Key to the realization of the components were the creation of a community at the space that likes to use it to work and collaborate, and the insights that form follows function.

Benchmarking (Second Diamond)

Findings from the previously described prototyping and testing groups with UU students were compared with benchmarking material from three innovation spaces that were visited by the researcher: TU/e innoSpace and Twente DesignLab in the Netherlands, and ETH SPH in Switzerland (see Table 3).

Table 3

Comparison of design components from prototyping and testing to benchmarking spaces

UU students	TU/e innoSpace (NL)	Twente DesignLab (NL)	ETH SPH (CH)
<i>Writable surfaces</i>	✓	✓	✓
<i>Pantry</i>	✓	✓	✓
<i>Plants</i>	✓	✓	✓
<i>Open space (different work modes)</i>	✓	✓	✓
<i>Recharge area</i>	✓	✓	✓
<i>Personal desks with monitors</i>	✗	✗	✓
<i>Project information board</i>	~	~	~
<i>Separate rooms</i>	✓	✓	✓
<i>Closed group space</i>	✓	✗	✓
<i>Event calendar</i>	~	~	~
<i>Standing desks</i>	✗	✗	✓

All compared innovation spaces had writable surfaces, a pantry, plants, a recharge area, and an open space which allowed for different work modes, e.g., group discussion, individual task completion, or prototyping with scraping materials. Writable surfaces were mainly provided as free-standing, movable whiteboards that were also used as spatial dividers at all locations. Twente DesignLab additionally hosted a round whiteboard table in a separate room, designated for group ideation. The pantries of TU/e innoSpace and ETH SPH were not as central as in Twente DesignLab, which had placed their pantry at the center of the space. The manager of Twente DesignLab emphasized the importance of a central pantry as the heart and meeting point for the community members of the respective ecosystem. Plants were seen in all spaces; however, they did not stand out particularly to the researcher. The look of the open spaces varied between the innovation spaces. Both TU/e innoSpace and Twente DesignLab offered identical squared tables in an open space that could be used freely by students, unless an event was happening at the same space. At ETH SPH, slightly more variety between

¹⁰ Defined as an area which provides space and tools to build small-scale prototypes, e.g., through wood working.

the sizes and shapes of the squared tables were found. The recharge areas differed between the spaces. At TU/e innoSpace, a designated “chill area” contained a ping pong table and cushioned benches as seating options. Twente DesignLab placed their recharging area close to the pantry. ETH SPH combined their recharge area, also close to the pantry, with informal meeting space using lower round tables and various seating options. Personal desks with monitors could only be found at ETH SPH, where these were working stations that were most prevalently used (source: Rafael von Sury, *marketeer & content producer* at ETH SPH). At none of the spaces, a project information board stood was seen by the researcher, however, it could have been missed. The mode by which community members knew about other projects seemed to be through informal communication at the space as well as its external communication, e.g., through social media channels. There were separate rooms at all spaces, however, they differed in their purpose. In addition to the use of separate rooms as meeting rooms, Twente DesignLab had designated group rooms for ideation and more creative work modes. Writable whiteboard walls were present in these rooms. In contrast, the main separated room at ETH SPH was a silence room with personal desks and monitors. Closed group space, particularly in the format of small, noise cancelling meeting booths, were found at the innovation spaces of TU/e and ETH. Event calendars were not visible at the visited spaces, however, events were distributed mainly through the communication channels. Standing desks were seen at ETH SPH.

Overall, despite some variation per location, the findings at the selected other innovation spaces mainly aligned with findings in focus groups with UU students in the second diamond.

5. Discussion

The aim of this study was to find design criteria on behalf of UtrechtCE that would make their proposed space, *The Playground*, aimed to facilitate more entrepreneurial behavior among UU students, likely attractive to students. Therefore, an inductive, DT-inspired research approach was utilized, which contained nine focus groups with UU students as participants. First, it was explored in seven focus groups which components students required at the proposed space, as well as, in consideration of factors that would likely hinder the impact of the proposed space, why they would not make use of it. Second, it was investigated how these components could be realized at the actual space through two focus groups, one for prototyping and one for testing purposes, at the proposed space on Utrecht Science Park (USP). Additionally, after both parts, the implementation of the identified components was examined at nine Dutch and one Swiss innovation space to create context for the findings.

This study provides evidence for student interest from students of the faculties BETA, GEO, and REBO, which ranked their likeliness to make use of the proposed space above likely. In contrast, students of the faculty of HUM are less likely to make use of the offer. Multiple reasons for this difference are conceivable. First, the sampling approach used in this study might explain the findings of a lower interest of the questioned humanities students. The focus groups containing students of BETA, GEO, and REBO were conducted in courses that either had facilitated explicitly entrepreneurial thinking (e.g., the first focus group with BETA students was conducted after a workshop on entrepreneurship), or contained students working on entrepreneurial projects (e.g., the questioned REBO students had to make a business plan as part of the course curriculum). In contrast, the sample HUM students had not been introduced to concepts of entrepreneurship before. The course had been chosen because of its listing as an entrepreneurial course on the UtrechtCE website, however, at the class, the researcher found in conversation with the course instructor that the course content did not explicitly teach an entrepreneurial mindset or skills. This might explain why these participants indicated that they were not motivated, did not see the added value, and did not feel ready to make use of the proposed space. Moreover, it gives reason to reevaluate the selection criteria for the listed entities of entrepreneurial education on the website of UtrechtCE. Second, entrepreneurial education is less prominent at HUM, compared to BETA, GEO, and REBO. For example, for bachelor's students, there are only 11 entrepreneurial minors and courses listed for HUM on the UtrechtCE website, compared to 24 for BETA, 32 for GEO, and 32 for REBO (*Entrepreneurial Education for Bachelor's Students*, n.d.). Also, students at HUM typically do not have classes on the Utrecht Science Park (USP), where the proposed space is situated. In contrast, BETA and GEO students regularly have classes on the USP. While REBO students mainly reside outside the USP, it is conceivable that the sampled participants saw more benefit in

making use of the offer than HUM students despite its location, in consideration of the stronger imprint of entrepreneurial education at REBO.

Despite the lower interest from HUM students, they indicated the same preferences for the purpose of *The Playground* as the other students. This finding provides evidence for the possibility of the implementation of one concept of the space for all students, which could still address individual student needs with individual offers or activities. Complementing this consideration, in makerspace research, it is established that participants have different needs that benefit from different support (Mersand, 2021). Therefore, to engage humanities students, the proposed space could organize targeted events for this student group, such as a marketing workshop for authors. With regards to the overall purpose, students prioritized working at the space over connecting and learning, when explicitly ask to rank these three activities. In interactive discussions, it became clear how much these activities are interconnected. Along those lines, another case study identified user behavior of mostly working within pre-organized groups or individually, compared to new acquaintances from the space (Bilandzic & Foth, 2013). The coding framework in the present study lacks resolution to discuss particulars of group formations, however, connecting with like-minded people at the space was found to be important to UU students. Therefore, the occurrence of new connections and how they would be used remains to be seen upon opening of the proposed space.

Collaboration was a reappearing theme in this study, which is a central element for innovation spaces (Caccamo, 2020; Oksanen & Ståhle, 2013). With regards to community, makerspace research also highlights the relevance of social interaction and community-building for the use of a space, ownership, project perseverance, and outcomes from the use of the space (Mersand, 2021). In addition to collaboration and community, productivity was requested at the proposed space, which seemed to have a positively associated side, when self-initiated by users of the space, and a negatively associated side, when enforced externally. According to students, only self-initiated productivity made the space attractive and was essential in its attraction. Ownership and self-regulation of learning are acknowledged in makerspace research for their positive effect on user motivation and participation (Mersand, 2021). Prototyping, an integral part in entrepreneurial activity (Camburn et al., 2017), had varying relevance for different student groups depending on their study discipline. For instance, creating a prototype was more relevant to participants of BETA compared to REBO. Power tools, such as 3D printers, for prototyping were not relevant to most students. It must be noted that findings from UU students were put into context with innovation spaces of mainly technical universities during benchmarking. These spaces are often referred to as fabrication laboratories (FabLabs) and differ in a stronger emphasis on equipment than makerspaces, for instance (Soomro et al., 2022). The strategic focus of the organization hosting an innovation space likely has implications for the design of such

space with regards to the necessity of more digital over non-digital fabrication, which was not explicitly addressed in this study. Importantly, students requested an overall different look of the space compared to other university spaces, which can be linked to the need for a creativity-endorsing environment at *The Playground* to fulfill its purpose of working on ideas (Suckley & Nicholson, 2018).

As a prerequisite to this study, physical space was proposed by UtrechtCE as the solution for the identified need to facilitate more entrepreneurial student activity at UU. Therefore, this study did not explicitly probe for advantages or disadvantages of physical space. It did find an emphasis of working together at the proposed space. The question about the benefits of meeting a group of people in-person arose in the last focus group of the first diamond, where many participants had done their group work in virtual meetings. Participants reasoned for meeting their group in-person, enhanced productivity and convenience (when meeting on location directly before or after the course), and against meeting their group in-person, different schedules and commuting time. Since the COVID-19 pandemic many teams have adapted their team work despite challenges to virtual environments (Wildman et al., 2021). Importantly, a key benefit from meeting in-person is the spontaneity of conversations that can create new insights and faster task completion, whenever content interactions are required (Whillans et al., 2021). However, physical space, even if specifically intended for collaboration, does not necessarily result in collaboration, as users can develop strategies to avoid collaboration (Irving et al., 2020). Nonetheless, herein, UU students have argued for collaboration at the proposed space, thus are likely to seek and not avoid it when coming there. It should be facilitated accordingly through the spatial design. Overall, due to the pre-defined solution of a physical space, spatial aspects were considered throughout the study by participants and the researcher and related to their purpose. Interestingly, space and its function were differently interpreted by different students. One participant, for example, considered a café-type area to be for recharging purposes, while another participant saw the same space for working or informal meeting purposes. This means that the spatial design should ideally allow different uses of the same space to accommodate such different individual purposes. The herein found combination of physical elements and social connections at an innovation space and the importance of such for its success is also acknowledged in literature (Santos et al., 2021).

The overall purpose of the space is not only correlated to spatial and social requirements but also to its embedding in the local entrepreneurial ecosystem. A dimension, which this study, despite its title, did not explicitly investigate, is the specific purpose of pre-incubation (spaces) compared to incubation (spaces). However, implicitly, the herein proposed space reflects pre-incubation defined in terms of “providing would-be entrepreneurs with the opportunity to test their ideas and business skills in a supported environment”, which was found to be effective when implemented in another case study (Voisey et al., 2013).

Recommendations

Taken together, in consideration of the findings in this study and existing literature, the following list of recommendations with regards to the design of the proposed space, *The Playground*, are shared with UtrechtCE:

In terms of spatial design:

- Include open and closed-off spaces.
- Include spaces designated to work and meet in open space, as groups or individuals; this space could contain at least two different types of table/chair formations.
- Include spaces designated to group work in closed-off space.
- Include writable surfaces, screens, and power outlets at workspaces.
- Include space designated to recharge; this space should be audio visually separated from the spaces designated to work and could contain a pantry (and possibly, active game options).
- Include space designated to events; this space could contain a stage and modifiable seating options to be used for different event formats.
- Include space designated to prototyping; provide the necessary materials close to that space.
- Include space that is bookable.
- Include storage space.
- Include plants, wooden furniture, and natural light (if possible) in the interior design; it should look thus feel differently than other university spaces.
- Some of the recommended spaces could have more than one purpose; thus, consider the modifiability and multifunctionality of each space.

In terms of community:

- Include motivated students in the development of the space, its design, and its organization.
- Show what is happening at the space (e.g., through a project information board and event calendar).
- Enforce rules (whenever possible) implicitly through social norms; the space should feel without obligation but productive.
- Encourage collaboration and knowledge sharing within the community (e.g., implicitly and through activities).
- Provide different expertise from people to support community members with questions.
- Reduce entry barriers as much as possible and welcome student ideas and projects openly.

Ultimately, what sets the proposed space apart from other spaces or offers at UU and its surroundings, is its combination of designated spaces and community (that still needs to be built).

Strengths and Weaknesses

The adaption of a DT approach (Brown & Wyatt, 2010) appears to be one of the strengths of this study as it enabled a structured, two-phased investigation in the needs of UU students for design components of the proposed space. The inductive approach allowed an unbiased and broad investigation, which is valuable in consideration of the context-dependence of the design to UU (Santos et al., 2021). Another strength is the number of focus groups that were conducted, taking into account that they take time to arrange and analyze (Bryman, 2016), as well as the variety of study disciplines of participants that they covered. A weakness of this study lies in the limited experience of the researcher with regards to qualitative research, particularly with focus groups and qualitative data analysis. This, in conjunction with the openness of the applied inductive approach and reflective action learning complicated the data analysis, as it left the researcher with a multitude of conceivable directions in making sense of participants' perspectives on the inherently multidimensional subject of this study, a multipurpose innovation platform with spatial dimensions. The choice of focus groups seems well suited to investigate student needs, as it allowed (interactive) data collection from a group of students simultaneously. However, the sizes of the focus groups conducted in this study occasionally exceeded the typical group size (6-10 participants) and techniques (moderated, recorded discussion resulting in a transcript used for analysis) (Bryman, 2016). Specifically, the use of questionnaires with pre-categorizing questions made the analysis according to established methods for focus groups more difficult. Nevertheless, to still be able to ensure reliability and validity of the study results, several actions were taken by the researcher to compensate her inexperience. Throughout the study, the researcher held regular, reflective debriefings about the study progress with the researcher's supervisor to benefit from the supervisor's profound experience in qualitative research. Moreover, to ensure the reliability of the coding process, the code book was reviewed twice at different levels of data integration, once by the researcher's supervisor and once by the researcher's student colleague at Utrecht CE, who have both multiple years of experience in qualitative research. In both cases, feedback on the codes and their categorization was integrated by the researcher and resulted in updated code book versions. Due to the high amount of data, which resulted in more than 300 codes, this study could have benefited from using software-assisted data analysis, for example, NVivo. In hindsight, the researcher could have allocated more time in the beginning of the study to familiarize herself in software-assisted data analysis tools to ease the documentation and increase objectivity of the analysis. The researcher did not do so due to the pace of the design process within the set study frame. Moreover, limited experience of the researcher in methodological approaches to qualitative data analysis during the study resulted in the application of a coding process, which was approved by the researcher's supervisor at the time but only later aligned by the researcher with methodological literature. This explains partial differences in terms of the vocabulary and definitions used for the

different levels of codes, (sub)categories, and themes compared to the herein applied, and therefore adapted approach of conventional qualitative content analysis (Bryman, 2016; Hsieh & Shannon, 2005; Vaismoradi et al., 2016). Nonetheless, this limitation was countered by the researcher through extensive and transparent description of the steps taken during the data analysis. The manual handling of the coding framework complicated the comparison of the findings with other innovation spaces, particularly, in consideration of the interconnectedness of its categories. To ensure reproducibility of the comparison, the individual categories were taken and used for the comparison. In hindsight, the benchmarking material could have been selected with closer relevance to the context of UU as a general university. On the other hand, the selected spaces herein were intended to add more context for each component rather than the overall offer. As another limitation could be seen that the researcher operated independently throughout the study, which is in contrast with most DT projects, which are typically operated by a team to avoid inherently individual bias (Camacho, 2016). This limitation was countered by the researcher, as best as possible, through consultation of UtrechtCE team members in decisions during the design progress. The individual operation had the benefit of making the researcher more agile in the data collection process, for example, in the planning of focus groups or visits at other innovation spaces. Lastly, there could have been more iterations of prototyping and testing ideally, however, this was not possible within the timeframe of this study.

Further Research and Implications

This study did not consider student perspectives from the Faculty of Medicine (MED), Faculty of Veterinary Medicine (VET), and Faculty of Social and Behavioral Sciences (SW), as the researcher encountered a zero-response rate by the contacted course instructors when sampling the focus groups. Considering the varied student interest of HUM compared to BETA, GEO, and REBO students, an investigation in the interest and needs of students at MED, VET, and SW for *The Playground* would be relevant. A complementary, systematic investigation in the needs of UU teachers for the space to fulfill its function as an innovative classroom would be recommended. For such, the video clip that was used within this study could be used, according to its original intention, to present the concept of the proposed space and show the actual space to UU teachers. Additional research is needed to address issues that arose in students' arguments why they would not make use of the space. For example, "no time" as a reason not to come nudges an investigation in how the time management of students could be improved. Similarly, "no motivation" as a reason not to come could be addressed by investigation in the effectiveness of the respective entrepreneurial education at UU. A systematic literature review on the realization and effectiveness of the herein proposed entrepreneurial education infrastructure, its identified design components and recommended design criteria was outside the scope of this study, however, could add relevant information to UtrechtCE's efforts in the design process of *The*

Playground. Particularly, the role of spatial design in fostering collaboration as well as creativity could be highlighted in more detail. More investigation in literature on pre-incubation spaces could also add valuable information. With regards to the complexity of human behavior in the use of open versus closed-off spaces (Bernstein & Turban, 2018), additional literature as well as empirical observation upon opening *The Playground* could complement the continuous improvement of its design. Also, since the herein conducted focus groups for the purposes of prototyping and testing focused on the overall atmosphere, iterations could prototype and test other components of the space, such as the implementation of non-digital fabrication/prototyping. Finally, the description of a day in the life of the proposed space and quantitative testing (e.g., a smoke test) would be conceivable next steps in the project development. During this study, a preliminary smoke test was conducted by posting a story on the UtrechtCE's Instagram, outlining the proposed space and inviting follower engagement with a reaction module. However, due to low follower engagement with UtrechtCE's Instagram stories in general (source: Carlijn Schäffers, *communications officer* at UtrechtCE), the results from this smoke test were not used in this report. The herein recommended additional smoke test would therefore engage with a more active follower base, for example, on the official UU Instagram. This would have the benefit of reaching a larger target audience (47.9k followers @*utrechtuniversity* compared to 1.128 followers @*uucentreforentrepreneurship*, 16-02-2023). The reason for not conducting a smoke test on the official UU Instagram during this study was the immaturity of the project design and the confidentiality of its development at the time.

6. Conclusion

This study was conducted on behalf of UtrechtCE to investigate design criteria for a new physical space, *The Playground*, at Utrecht University (UU) aimed to facilitate more entrepreneurial behavior among UU students, in addition to UU's existing entrepreneurial education infrastructure. In focus groups with UU students, the first research question ("*What are the components that would make the proposed space most likely attractive to students?*") was addressed, and answered in terms of purpose, requirements, and reasons for failure. The purpose of the space was outlined as work of student groups on projects, in collaboration with like-minded people, through learning by doing with input from others' experience or expertise, and taking work breaks in designated recharge space. Students valued a productive, collaborative, and supportive atmosphere at the proposed space, which, if not met, would be the main reason not to make use of the space. Moreover, students visualized the concept of *The Playground* at the actual place on the Utrecht Science Park (USP) to answer the second research question ("*How are these components realized in the actual space?*"). They envisioned group and individual work modes facilitated in a combination of open and closed-off spaces with writable surfaces, screens, and power outlets, knowledge shared within the community and in events, hands-on learning through project work and small-scale prototyping, and recharging with coffee and/or tea in a space for such purpose. The distinct atmosphere would be created through a different look than other university spaces, for example, with different furniture, plants, and visibility of student projects. Ultimately, students expected to enter a space that sets the stage for entrepreneurial activity with its look and community with shared mindset and values.

Therefore, recommendations have been formulated in terms of spatial design and community. Key to make the proposed space likely attractive to UU students is the availability of various, designated spaces enabling different work modes, collaboration, events, and recharging. This unique combination of space and people should create a distinct, inspiring atmosphere, that needs to be felt by students upon entering the space. Therefore, to be successful, *The Playground* needs to become home to a new, proactive student community that should be encouraged to live and improve the space according to their needs.

This study was the first of its kind to investigate student needs for the new concept of *The Playground*. Throughout the study, findings were shared with UtrechtCE and contributed validated insights from UU students that were used to communicate the concept to stakeholders and architects in the process. It provided evidence for sufficient student interest for the continuation of the project, while also calling for continued investigation and integration of student perspectives in the design to prepare the best possible (pilot) version of *The Playground* for its opening in the (hopefully nearby) future.

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8. Appendices

Appendix A: List of Benchmarking Spaces

Innovation space	Location
TU/e innoSpace	Eindhoven, NL
VU StartHub	Amsterdam, NL
Demonstrator Lab	Amsterdam, NL
HKU X	Utrecht, NL
Vechtclub	Utrecht, NL
Impact Studio	Delft, NL
BK-Launch	Delft, NL
PLNT	Leiden, NL
Twente DesignLab	Enschede, NL
ETH SPH	Zurich, CH

Appendix B: Question Lists Focus Group 1-7

Focus Group 1

1. Who do you want to meet there?
2. What do you want to do there, and what or who do you need for that?
3. What else is there?
4. Why wouldn't you come?
5. Rate from 1 to 5 (1 = won't come; 2 = unlikely to come; 3 = likely to come; 4 = very likely to come; 5 = will come): How likely is it that you will come to *The Playground* at least once during your studies?
6. Please provide your contact (name + email) to stay informed on *The Playground*!

Focus Group 2

1. What do you want to do at *The Playground*?
 - a. Learn from experienced people
 - b. Networking
 - c. Get advice/guidance
 - d. Work on own project
 - e. Brainstorm/Discuss
 - f. Idea presentation/Pitching
2. Add what you want to do at *The Playground*!
3. What do you need for that?
 - a. Power tools
 - b. Screens/Monitors
 - c. Whiteboards
 - d. Workspaces
 - e. Meeting rooms
 - f. Good atmosphere
4. Who do you need for that?
 - a. More experienced entrepreneurs
 - b. Successful entrepreneurs
 - c. Experts in certain disciplines
 - d. Other students (interested in entrepreneurship)
 - e. Groups looking for team members
 - f. Investors
5. Add what and who you need for that!
6. Why would you not make use of the offer?
 - a. Location
 - b. Too formal/Obligations
 - c. Noone is there
 - d. Too much going on there
 - e. Don't see the added value
 - f. No time
7. Add why you would not make use of the offer!
8. Rate from 1 to 5 (1 = won't come; 2 = unlikely to come; 3 = likely to come; 4 = very likely to come; 5 = will come): How likely is it that you will make use of *The Playground*?
9. Please provide your contact (name + email) to stay informed on *The Playground*!

Focus Group 3 and 5

1. What do you want to do at *The Playground*?
 - a. Learn
 - b. Work (on idea/project)
 - c. Connect

2. How do you want to learn at *The Playground*?
 - a. By following a lecture
 - b. By listening to a guest talk
 - c. By having a 1on1 conversation
 - d. By seeing a “Hall of Fame/Failure”
 - e. By reading a book or story
 - f. By doing
3. How do you want to work on your idea/project?
 - a. By yourself
 - b. By teaming-up
 - c. By presenting your idea
 - d. By getting regular feedback
 - e. By creating a prototype
 - f. By testing your idea with a user
4. How do you want to connect at *The Playground*?
 - a. By being there
 - b. By going to an event
 - c. By joining a workshop
 - d. By joining a program
 - e. By participating in a hackathon
 - f. By meeting 1on1
5. Which expertise is most beneficial to the development of your idea/project?
6. What defines a good atmosphere at *The Playground*?
7. Why would you not make use of *The Playground*?
 - a. I don't like its general settings.
 - b. I don't like its faculties.
 - c. I don't like its social atmosphere.
 - d. I don't like its working atmosphere.
 - e. I don't see the added value.
 - f. I don't feel ready.
 - g. I am not motivated.
 - h. I am afraid.
8. Add why you would not make use of *The Playground*!
9. Rate from 1 to 5 (1 = won't come; 2 = unlikely to come; 3 = likely to come; 4 = very likely to come; 5 = will come): How likely is it that you will make use of *The Playground*?
10. Please share your email for follow-up on *The Playground*!

Focus Group 4

1. What do you want to do at *The Playground*?
 - a. Learn
 - b. Work (on idea/project)
 - c. Connect
2. Specify what you want to do at *The Playground*!
3. Which expertise is most beneficial to the development of your idea/project?
4. What makes *The Playground* attractive to you (e.g., wording, activities, people, atmosphere, incentive)?
5. Why would you not make use of *The Playground*?
 - a. I don't like its general settings.
 - b. I don't like its faculties.
 - c. I don't like its social atmosphere.
 - d. I don't like its working atmosphere.
 - e. I don't see the added value.
 - f. I don't feel ready.

- g. I am not motivated.
- h. I am afraid.
- 6. Add why you would not make use of *The Playground*!
- 7. Rate from 1 to 5 (1 = won't; 2 = unlikely; 3 = likely; 4 = very likely; 5 = will): How likely is it that you will make use of *The Playground*?
- 8. Please share your email for follow-up on *The Playground*!

Focus Group 6 and 7

- 1. What if *The Playground* was already real, when and how would you work there on your projects during your course?
- 2. What if *The Playground* was already real, when and how would you work there on your projects after your course?
- 3. Rate from 1 to 5 (1 = won't; 2 = unlikely; 3 = likely; 4 = very likely; 5 = will): How likely is it that you will make use of *The Playground*?
- 4. Please share your email for follow-up on *The Playground*!

Appendix C: Code Book Final Version

Codes	Sub-Categories	Categories	Themes	
Listen to experienced people	Learn from others	Learn	Purpose	
Library				
Read				
Lectures				
Periodical thematic talks				
Inspirational stories				Get inspired
Startup posters of other people				
Inspiring quotes				
"Hall of Fame/Failures"				
Historic entrepreneurship cases				
Prototype examples				
Documentaries				
Creative stimuli				
Get new ideas				
Idea board				
Workshops	Learn by doing	Work		
Pitch training				
Whatever skill you need to learn				
Experience entrepreneurship in real life				
Learning by doing				
Develop ideas	Develop idea			
Be creative				
Brainstorm/Discuss				
Try out ideas				
Work on own project				
Planning				
Make business plan				
Prototyping	Validate idea			
Consumer validation and feedback				
Assess feasibility				
Pitching				
Reach the next step				
Show products	Get support			
Get advice and guidance				
Help to make the first steps				
Emotional support				
(Regular) feedback				
Mentor pairing				
Get in contact with incubators				
Make deals	Get funding			
Money				
Networking	Network	Connect		
Find helpful contacts				
Business cards				
Exchange with other entrepreneurs	Team up			
Work together (with students)				
Form teams				
Be able to join other projects				
Find new people to help with the project				
Community building activities (e.g., borrels)	Community			
Share ideas				
Talk with other students				
Book club				
Online platform to get connected				
Beverages and snacks	Consumption		Recharge	
Healthy food				
Coffee/tea	Leisure			
Ping Pong				
Pool				
Table tennis				
Table soccer				
Darts				
Games				
Football				
Swing				

Slides			
Random recreational stuff			
Break activities			
Yoga mats			
Play			
Sleep			
Experts in different disciplines	Knowledge	People	Requirements
Older students/alumni			
Lawyers			
Smart people			
Professors/teachers			
Creative people	Peers		
Students (interested in entrepreneurship)			
Differently skilled students			
Like-minded people			
High positions in industries	Influence		
Influential people			
Politicians			
Journalists			
Investors	Means		
People with network			
Clients	Entrepreneurship		
Stakeholders			
Entrepreneurs			
Players in UU's Entrepreneurial Ecosystem			
Business school staff			
Critics			
Audience			
Dancers			
Actors	Random		
A "muse"			
Sports idols			
Children			
Representatives from associations			
Friends			
Motivational speakers			
Host	Staff		
Kitchen personnel			
Biomaterials	Idea-related	Expertise	
Bio fabrication			
Engineering			
Bioinformatics			
Coding			
Editing			
(Creative) Writing			
Statistics			
Technology			
Linguistics			
Business			Action-related
Innovation			
Economics			
Marketing			
Sales			
Market research			
IT			
Technical experts			
Funding			
Financial advice			
Feedback on feasibility			
Feedback from customers			
Project design			
Consultancy			
Law			
Pitching			
Production			
Scaling up	Entrepreneur-related		
Personal entrepreneurship experience			
Out of the box thinking			


Creativity			
Design			
Entrepreneurship theory			
Fun/Playful	Causal but productive		
Causal			
Productive			
Participation			
Professional communication			
Motivated people			
Positive atmosphere			
Inspiring			
Creative	Encouraging		
Space for questions and curiosity			
Being able to fail			
Constructive feedback			
Supportive	Step by step		
Interactive guiding/counseling			
Time to reflect			
Calm environment	Calm		
Quiet places			
Plenty of light/bright			
Good acoustic			
Plants/green			
Wood architecture			
Aquarium			
Reduce stress			
Clean			
Comfortable lighting			
Comfortable seating			
Comfortable			
Open-minded			
Accepting	Tolerant		
Diverse			
Fearless			
Welcoming			
All ages, nationality, disability			
Collaborative	Collaborative		
Co-working			
Community			
People			
Shared exclusivity			
Communication			
Friendly			
Round tables to meet others			
Socializing			
IP/NDA for open discussion environment			
The right atmosphere	Others		
Colorful			
Music			
Focus on independence			
Sustainability			
Mental health			
Relaxed but chic	Spaces		Space
Spatial division			
Open space			
Presentation area			
Workspaces			
Crafting area			
Meeting rooms			
Quiet space (to read or think)			
Calm place to talk			
Temporary privacy			
Lounge area/chill spot/break room			
Entertainment/recreation area			
Place to gather			
Evaluation spaces			
Creation help desk			
(Soundproof) call booths			

A little shop						
Cafe						
Powernap room						
Gym/Sports center						
Showers						
Bathroom						
Outdoor space						
Chairs						
Tables						
Drawing tables						
Dynamic tables						
Lamps						
Furniture						
Decoration						
Nice design						
Art						
Kitchen						
Benches						
Massage chair						
Beanbags						
Hammocks						
Couches						
Cushions						
Music						
Musical instruments						
Radio						
Light from windows						
Fresh air						
Temperature regulation						
Plants						
Soil for plants						
Pet animal (e.g., cat, dog, fish)						
Online registration						
24/7 access						
No costs						
Consumer talk cards						
Templates						
Power tools (e.g., 3D printer)						
Crafting materials (e.g., lego)						
Screens/monitors						
Computers						
Beamers						
Internet						
Power outlets						
Software						
Noise cancelling headphones						
Whiteboards						
Flipovers						
Blackboards						
Sticky notes						
Paper						
(Colorful) pens						
Drawing equipment						
Location						
Weird hours (of events)						
Access barriers						
Not in English						
Not enough space						
Too much space						
Not well equipped enough						
Ugly space						
Lack of things to do						
If it's boring						
No staff						
No events						
Different than imagined						
Bad sound/acoustic						
Bad smell						
				Interior design		
				Attributes		
	Access					
	Templates					
	Prototyping					
	Tech infrastructure					
	Things to write on/with					
	General settings don't match preferences	I won't come because	Reasons for failure			
	Facilities don't match preferences					

Don't like the people (too confrontational/not collaborative enough)	Social atmosphere doesn't match preferences		
Need of external people			
Nobody interests me there			
Noone is there			
Not social enough			
Social anxiety/socialization barrier	Working atmosphere doesn't match preferences		
Bad atmosphere			
Too productive/formal/ obligations			
People are not productive			
People approaching too much/distracting			
Too crowded	Don't see the added value		
Too chaotic/too much noise			
Prefer own room			
No interdisciplinary people			
Don't see added value			
Similar places			
Better options			
Prefer online meetings			
Waste of time			
Not helpful/useful			
Too complicated			
No benefit for oneself directly			
It's not something that helps me to achieve my goals personally			
Don't need it			
If I think that I can go straight to the incubator			
I don't know what's there for me			
Need incentive to come			
People to go with are not going			
Too lazy			
Explore different things	Don't feel ready		
Not interested			
Not interested in entrepreneurship			
Not enough seed capital to start			
Not prepared enough			
No partner yet			
No ideas			
I'm not entrepreneurial			
Idea not good enough	Afraid		
Step is still too large			
Not clear what my contribution would be			
Don't know how to communicate the idea			
Afraid to fail	Others		
Judgement by others			
Embarrassed by not knowing what to do			
Scared/awkward			
Stealing ideas			
Don't know about it			
No introduction			
Too much stress			
No time			
Too focused on money			
Unclear purpose			
Bad review			
Too much rumour/people talking			
Weather			
Different value			
No good coffee			
No fun			
No vibe			

Appendix D: Prototyping and Testing Posters

Prototyping

The Playground  ①
Come in & get your ideas going

Purpose! "WHAT"

- Work on your idea/project @ get support!
- Connect with peers & experts
- Recharge from work
- Learn from experienced people by doing

Today: "HOW" does that LOOK like? {our virtual prototype}
"HOW" does that FEEL like?

Let's visualize this space:

→ Pinterest login: playground@uwnl; HappyIdeation (user name) (password)


In terms of:

- color
- furniture
- mood
- atmosphere
- vibe
- decoration
- people in action

Follow-up: bmeyer1@uwnl

STAPLES

Testing

The Playground  ②
Come in & get your ideas going

Purpose! "WHAT"

- Work on your idea/project @ get support!
- Connect with peers & experts
- Recharge from work
- Learn from experienced people by doing

Today: React to & Improve our virtual prototype
"HOW" does it feel/look like?

→ Miro login: link in email; HappyBrain storm! (password)

Instructions:

- Move images to YES/NO.
- Add post-its to explain WHY.
- Add images of what is missing.

Follow-up: playground@uwnl

STAPLES