Uni-visitors

The drivers, barriers, and strategies focusing on sharing the learning environment from a university with third parties

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Abstract

Dutch universities are increasingly challenged to balance educational excellence with sustainable and efficient campus management. Amid tightening public budgets and rising space demands, sharing educational spaces with third parties, such as other educational institutions, government bodies, businesses, and community organizations, has emerged as a promising strategy. These collaborations offer opportunities for optimizing real estate usage, reducing underutilized space, generating additional revenue, and fostering societal engagement. However, the adoption of space-sharing practices remains limited and uneven, often falling short of institutional ambitions.

This thesis investigates the current drivers, barriers, and strategies that shape the sharing of educational spaces in Dutch universities. Drawing on a comprehensive mixed-method approach, including literature review, stakeholder surveys, and semi-structured interviews with facility managers and campus strategists, the study explores both operational realities and strategic frameworks underlying space-sharing initiatives. A central contribution is the development and application of the S.P.A.C.E. matrix (Strategic Fit, Practicality, Accessibility, Collaboration, Economics), which enables comparative analysis of universities' readiness and alignment for shared use of specific space types.

Findings reveal that while universities recognize the societal and financial value of shared spaces, significant obstacles remain. These include decentralized governance, cultural resistance among faculty, logistical and scheduling complexities, and unclear financial or legal frameworks for third-party use. Despite these barriers, pioneering practices across universities illustrate promising pathways for integrating third-party collaborations into long-term campus strategies. Moreover, the study highlights the role of national platforms like Campus NL in facilitating peer learning, benchmarking, and policy alignment across institutions.

This research contributes new theoretical and practical insights into campus real estate management, with implications for policymakers, university leaders, and planners. It supports a shift from ad-hoc sharing toward a more strategic, inclusive, and future-proof approach to educational space use, positioning the university as a collaborative node within broader knowledge ecosystems.

Management Summary

Dutch universities face increasing pressure to do more with less, optimize campus space, strengthen societal engagement, and reduce underutilization, without compromising educational quality. Sharing educational spaces with third parties offers a powerful, underused solution. Yet despite clear benefits, most institutions lack the structure, coordination, and strategy to implement it effectively.

This thesis identifies the drivers, barriers, and actionable strategies for universities seeking to structurally share their educational spaces. Based on literature, a national survey via Campus NL, and interviews with five universities, the research introduces the S.P.A.C.E. matrix, a decision-support tool for aligning spatial opportunities with institutional goals.

Key Insights:

- Drivers such as cost-efficiency, social value creation, and regional collaboration are widely recognized, but not yet systematized.

- Barriers, notably decentralized governance, internal resistance, inadequate planning tools, and unclear financial models, continue to stall structural progress.

- Best practices show that targeted initiatives (e.g., TU/e's Innovation Hub, UU's shared library) are already yielding results, but remain isolated and disconnected.

Strategic implications:

1. Treat shared space as a strategic asset, not an operational leftover. Align it with mission, values, and long-term capacity planning.

2. Establish central coordination mechanisms, such as a campus-wide 'shared space desk' or governance team, to prevent fragmentation.

3. Implement dynamic scheduling and data systems to unlock real-time insight into space usage and availability.

4. Create a national peer-learning structure, using Campus NL as the platform for benchmarking, knowledge exchange, and scaling up.

5. Use the S.P.A.C.E. matrix to guide decisions, assess readiness across five dimensions (Strategic Fit, Practicality, Accessibility, Collaboration, Economics), and prioritize where and with whom to share.

Call to action:

Universities must move beyond ad-hoc sharing to embrace a proactive, structured approach. This requires institutional ownership, cultural change, and collaboration across the sector. A shared campus is not only a spatial strategy, but also a signal of public value, academic openness, and future readiness.

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Foreword

Universities are more than just places of instruction; they are public institutions that have a role in a larger societal ecosystem. As a student, I have experienced firsthand how the physical campus can shape learning, collaboration, and personal development. This thesis is based on a deep belief that university campuses should not only serve enrolled students but also offer value to the wider community: to inspire, connect, and enable others to grow.

The idea of sharing educational spaces is, in my view, a critical step toward that future. Especially in times of financial constraint, spatial scarcity, and urgent societal transitions, it is essential that we rethink how we manage and use our collective educational infrastructure. I hope that this research contributes to a more open, adaptive, and purpose-driven role for universities in the Netherlands.

This thesis would not have been possible without the guidance and support of those who challenged and encouraged me along the way. I am especially grateful to Alexandra den Heijer, whose sharp insights, critical questions, and tireless enthusiasm have helped me sharpen the strategic relevance of this work. Her vision of the university as a "valuable and viable ecosystem" has deeply influenced my thinking. I would also like to thank Remon Rooij for his constructive feedback, his consistent focus on societal value, and for always encouraging me to ground my work in practical realities.

To both Alexandra and Remon: thank you for your mentorship, your time, and your belief in the importance of this topic.

I hope this work sparks further dialogue, within universities, across institutions, and among the many stakeholders who shape the future of our educational spaces.

Martin Leonard Lejewaan
TU Delft, June 2025

Part I – Introduction and Context

This part introduces the central theme of this thesis: the sharing of educational spaces between universities and third parties. It outlines the societal and institutional context in which this topic has become increasingly relevant, especially in light of financial constraints, sustainability goals, and evolving educational demands. The problem statement highlights the gap between the potential and actual implementation of shared spaces. The section concludes with an exploration of key literature and the rationale for this research, establishing the foundation for the subsequent parts of the study.

1. Introduction

1.1 Problem statement

Universities in the Netherlands face the dual challenge of fulfilling their educational and research missions while managing financial and operational constraints. Sharing educational spaces with third parties has emerged as a potential strategy to optimize campus resource use, generate revenue, and foster academic partnerships. However, despite these potential benefits, the current extent of space-sharing falls short of ambitions due to various barriers and misalignments in strategy and practice.

According to Alexandra den Heijer's research on campus management, universities must manage their campuses as "valuable and viable ecosystems" that support multiple functions and diverse stakeholders (Den Heijer, 2011). This requires aligning space-sharing practices with strategic priorities that enhance both academic and non-academic use. However, achieving this alignment is difficult due to several barriers. One major challenge is the regulatory constraints associated with the use of publicly funded spaces, which can limit the flexibility of universities to collaborate with other parties (Den Heijer, 2011; Curvelo Magdaniel et al., 2019). Additionally, logistical and operational inefficiencies, such as inadequate scheduling systems and maintenance practices, hinder the seamless integration of space-sharing initiatives (Den Heijer et al., 2016).

Cultural resistance within universities also poses challenges, as faculty and staff may prioritize internal academic activities and perceive external use as disruptive or conflicting with their core missions (Curvelo Magdaniel et al., 2019). This resistance is often compounded by concerns that increased collaboration with other institutions could compromise the availability and quality of spaces for students and educators.

While financial drivers, such as additional revenue streams and cost-saving measures, motivate universities to share educational spaces, these are often not fully aligned with long-term strategic goals. Den Heijer (2011) highlights that sustainable space-sharing practices require universities to integrate strategic planning with operational management to avoid ad-hoc or reactive approaches that may lead to suboptimal outcomes.

To overcome these challenges, universities need a deeper understanding of the drivers and barriers that influence space-sharing practices. Such insights are essential for developing strategies that not only meet financial and operational goals but also align with their educational and research missions. The research will explore the types of third parties that can be partnered with, the kinds of spaces typically shared, and the motivations behind space-sharing. Furthermore, it will examine how these insights can be shared among universities to improve space-sharing practices.

Understanding these factors will provide a foundation for universities to enhance their collaborations and serve as a catalyst for realizing the full potential of shared educational spaces.

1.2 Literature and market research

1.2.1 Drivers for increase in sharing

The increased sharing of educational spaces among universities in the Netherlands is anticipated as institutions respond to financial constraints and aim for greater efficiency in their real estate use. Recent financial pressures, stemming from reductions in public funding, rising operational costs, and the need to demonstrate economic sustainability, have driven universities to explore innovative solutions to optimize their existing resources (Estermann, n.d.; Terlević et al., 2015).

Efficiency gains through space sharing offer a compelling solution for higher education institutions. By collaborating with other educational institutions to share underutilized classrooms, auditoriUMs, and meeting spaces, universities can generate supplementary revenue streams to help cover maintenance and operational costs (Benneworth et al., 2015). This practice not only alleviates financial pressure but also promotes the efficient use of campus infrastructure, reducing the need for new building projects and aligning with sustainability goals (De Boer et al., 2007).

Additionally, space-sharing arrangements with third parties foster a collaborative academic environment that benefits all parties involved. These partnerships can enhance the university's academic profile, facilitate knowledge exchange, and create opportunities for shared events, joint initiatives, and co-hosted activities (Teixeira et al., 2006). However, universities must manage these arrangements thoughtfully to ensure that their primary academic activities remain unaffected and that shared spaces meet the needs of all stakeholders (Williams, 2016).

1.2.2 Barriers of sharing

Universities often face restrictions imposed by zoning laws, safety regulations, and public funding constraints, which can limit their ability to engage in partnerships with other educational institutions (Williams, 2016).

Operational and logistical challenges further complicate effective management of shared spaces. Successful implementation requires sophisticated scheduling systems and coordination to prevent conflicts with academic use. However, many universities lack the necessary infrastructure and management capabilities to support seamless collaboration (De Boer et al., 2007). Den Heijer (2011) highlights the importance of designing campuses as multifunctional environments, which calls for robust operational strategies to enable smooth, multi-institutional use. Yet, insufficient technological support and resource allocation can lead to scheduling conflicts, reduced student access, and increased wear and tear on facilities, ultimately affecting universities' core educational missions (De Boer et al., 2007).

Cultural resistance within academic institutions also poses significant challenges to space-sharing with other educational institutions. Universities often prioritize their own educational and research activities, resulting in reluctance among faculty and administration to embrace initiatives involving external partners. Concerns about preserving academic integrity and minimizing disruptions further reinforce this resistance (Terlević et al., 2015). Den Heijer (2016) stresses that shifting institutional culture is essential for fostering collaboration with other educational institutions, enabling a more open and cooperative approach to resource utilization.

Financial considerations add another layer of complexity. While sharing spaces with other educational institutions can provide financial benefits, the initial costs of adapting facilities for shared use, such as upgrading technology, improving security systems, or redesigning spaces, can be a significant barrier (Teixeira et al., 2006). Universities often stUniversity Egle to align space-sharing initiatives with their strategic goals, finding it difficult to balance income generation with their educational and research missions.

Ensuring quality and maintaining shared spaces are additional challenges. Increased usage by multiple institutions can lead to accelerated wear and tear, resulting in higher maintenance costs and potential disruptions for academic users (Benneworth et al., 2015). Den Heijer (2011) advocates for proactive maintenance strategies as part of campus management to ensure that shared spaces meet the quality standards required for all stakeholders. However, implementing such plans often involves substantial financial and logistical burdens.

Finally, establishing and managing effective partnerships with other educational institutions requires significant administrative oversight. Many universities lack the expertise or resources to coordinate these relationships and address the diverse needs of multiple stakeholders (Williams, 2016). Without strong partnership management, space-sharing arrangements risk leading to conflicts and inefficiencies, undermining their potential benefits.
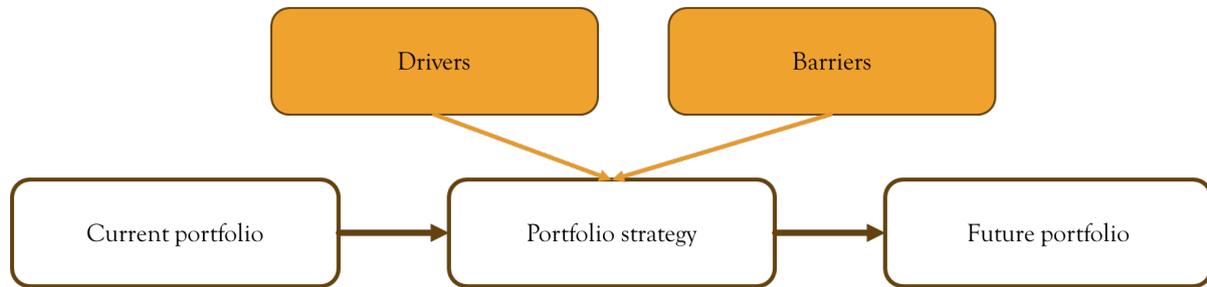
Figure 1 Conceptual model based on first research, own work.

1.2.3 Shared Educational Spaces at universities

Dutch universities increasingly view their campuses as flexible, multi-stakeholder environments, blending teaching, research, and societal engagement.

University of Groningen

The University of Groningen has pioneered the implementation of Active Learning Classrooms (ALCs) in 15 buildings (figure 1), offering over 900 flexible seats. These dynamic spaces encourage faculty to experiment with interactive pedagogies and are available to all teachers across disciplines. The ALCs also accommodate external workshops and community events, demonstrating a clear shift toward openness and joint use of campus facilities.

Figure 1: Active Learning Classrooms at the UG (RUG, 2025)

Utrecht University – Science Park De Uithof

Science Park De Uithof, co-located with HU and UMC Utrecht, features centrally shared assets, including the main library (figure 2), botanical garden, and multi-use lecture halls. These facilities support diverse activities, from academic study to public science events, reflecting a campus-as-community model.

Figure 2: Campus library (UU, 2025)

TU/e Campus – Eindhoven

TU/e operates a central Common Room (figure 3) where staff and students mix informally, meeting, studying, or collaborating. Its smart workplace system also supports cross-faculty room booking and efficient space utilization. The Innovation Hub on campus further hosts co-working spaces and shared labs for startups and researchers.

Figure 3: The Common Room (TU/e, 2025)

These examples underscore a broader shift in Dutch higher education: campuses are evolving into collaborative knowledge ecosystems rather than static, discipline-based zones.

1.2.4 Proposed solution

A proposed solution for improving the sharing of educational spaces in Dutch universities is the development of a knowledge-sharing platform based on best practices. Before starting this research, it seemed logical that Dutch universities could benefit from some kind of national platform or network where they can exchange experiences about sharing educational spaces. While many universities are already experimenting with this in different ways, these efforts often remain isolated. There is little structured learning between institutions, even though they are dealing with similar challenges like scheduling issues, unclear policies, or cultural resistance.

The idea was that by creating a practical network or community of practice, universities could learn from each other's successes and failures. The expectation is that such a network can help universities with a more coordinated and supported approach to making better use of their educational spaces.

To bridge the gap between isolated experiments and structural learning, Campus NL provides a valuable national platform for knowledge exchange. As a network that connects all Dutch universities through facility and strategy professionals, Campus NL can guide universities in aligning their space-sharing ambitions with operational realities. By fostering peer exchange, aggregating insights, and facilitating benchmarking, Campus NL supports a coordinated transition toward more strategic and efficient educational space use.

1.3 Societal and scientific relevance

1.3.1 Societal relevance

Sharing educational spaces with third parties, such as businesses, government organizations, and community groups, offers universities the chance to make better use of their buildings and resources. Since many universities are publicly funded, it makes sense to open their spaces to others when they aren't fully used. This helps to avoid waste, saves on unnecessary new construction, and makes better use of public money. It also supports sustainability goals by reducing the environmental impact of building and maintaining extra space.

At the same time, sharing spaces creates new chances for working together. It allows universities to connect with all kinds of organizations, from research partners and startups to schools and local communities. These partnerships can lead to joint projects, events, and activities that benefit not only the university but also society. For example, companies and researchers might work together on innovation, or community groups might organize activities that bring people to the campus.

Space-sharing also makes the university more open and accessible. It gives young people, like school students, the chance to experience the university environment at an earlier stage. This could help them feel more connected to higher education and influence their choices for the future.

Finally, sharing spaces helps universities stay flexible. Whether student numbers go up or down, or funding changes, making smarter use of what they already have helps them adapt. It supports long-term goals like sustainability, collaboration, and keeping the connected to society.

1.3.2 Scientific relevance

Sharing educational spaces with third parties is not just practically useful, it also offers interesting opportunities from a scientific perspective. It creates a setting where researchers, teachers, students, and external partners can meet, work together, and exchange ideas. This kind of collaboration can lead

to new research projects, creative solutions, and new ways of looking at complex social and scientific problems. By mixing people from different backgrounds, sectors, and disciplines, universities can push innovation forward.

It also makes universities themselves an interesting research topic. By looking at how space-sharing works in practice, how it is organized, what goes well, and where it gets stuck, researchers can learn more about collaboration, real estate management, and how organizations deal with change. This knowledge can help improve how universities design and manage their campuses, but it can also offer lessons for other sectors that face similar challenges with shared spaces.

Sharing spaces also fits into the bigger scientific discussion on sustainability. Making better use of existing buildings can reduce the need for new construction and lower the environmental impact of campus operations. Studying how shared spaces contribute to things like lower energy use or more efficient building management can help universities develop practical strategies to reach their climate goals.

Finally, sharing spaces brings up questions about how universities balance their different roles, offering education, doing research, managing their buildings, and being part of society. Researching how they deal with this balancing act can offer useful insights for university leadership, policymakers, and researchers who study how large organizations work.

Part II – Research Design and Methodology

This part presents the research approach used to investigate the drivers, barriers, and strategies involved in sharing educational spaces. It explains the scope and ambition of the study and defines the central research question and sub-questions. The methodology is described in detail, including the use of both qualitative and quantitative methods. This part also outlines the research phases, ethical considerations, and expected outputs, forming a roadmap for how the study was conducted and how the findings will be presented.

2. Research method

2.1 Research question

To address the missing overview of the current situation of sharing spaces with other educational institutions, the following research questions will be answered in this research:

- **What are the current drivers, barriers, and strategies for universities in adjusting their portfolio of shared educational spaces with third parties?**

To answer this question, the sub-questions need to be defined as such so they answer all information points separately. Below is an overview of their purpose and which research method will be used:

- o **1. Who are the current third parties that universities focus on when sharing their educational spaces?**

Purpose: To identify the specific external stakeholders, such as businesses, NGOs, government agencies, and community organizations, with whom universities most frequently engage when sharing educational spaces.

Research Method: A literature review, a survey, semi-structured interviews.

- o **2. What types of educational spaces are currently shared with third parties?**

Purpose: To map out which types of spaces (e.g., lecture halls, conference rooms, labs, auditoriums) are most used for sharing and the conditions under which they are made available.

Research Method: A literature review, a survey.

- o **3. Why do universities seek to share educational spaces with third parties?**

Purpose: To explore the motivations behind universities' decisions to share spaces. This includes financial incentives, fostering innovation through partnerships, fulfilling community engagement missions, or enhancing their public profile.

Research Method: A literature review, a survey, semi-structured interviews.

- o **4. What are the current strategies for universities in sharing educational spaces?**

Purpose: To assess how universities adapt their strategic goals and long-term vision in response to shifts in the reasons and scale of space sharing. This analysis will reveal if changes lead to increased partnerships, diversification, or refocusing of objectives.

Research Method: Semi-structured interviews.

2.2 Scope and aims

For this research, the participation of multiple universities is required to get the best output of this research. The scope for this research is the current situation with sharing spaces and what the ambitions and plans are with the focus on their asset management. With that information gathered, these will be compared and give insight and possible advice on acting on their plans in asset management to get it aligned with their ambitions in sharing educational spaces with third parties.

Scope

Types of Educational Institutions and Spaces: The research will examine the types of educational institutions (e.g., universities, vocational schools, secondary schools) that can effectively collaborate in sharing spaces and the types of spaces typically involved, such as classrooms, lecture halls, laboratories, libraries, and event spaces.

Key Drivers and Barriers: The study will analyze the drivers motivating universities to engage in space-sharing practices, such as financial pressures, sustainability goals, and opportunities for academic collaboration. Simultaneously, it will investigate barriers, including cultural resistance, regulatory constraints, logistical challenges, and maintenance concerns.

Strategic Alignment: It will explore how universities can align space-sharing practices with their educational, research, and strategic goals while ensuring these initiatives do not compromise their primary missions.

Aims

Enhance Efficiency: To identify strategies for optimizing the use of educational spaces, reducing resource waste, and promoting financial sustainability.

Facilitate Collaboration: To explore how shared spaces can foster partnerships between educational institutions, support interdisciplinary collaboration, and drive innovation.

Address Challenges: To develop practical recommendations for overcoming cultural, operational, and financial barriers to space sharing.

Inform Policy and Practice: To provide universities and policymakers with evidence-based insights and frameworks to guide the development of effective and equitable space-sharing practices.

Advance Knowledge: To contribute to academic literature on campus management, resource optimization, and institutional collaboration by generating new data and perspectives on the topic.

2.3 Research design

The research will follow a mixed-methods approach combining qualitative and quantitative research techniques to ensure a comprehensive understanding of the problem and the development of a robust tool. The study will be conducted in four phases, each with specific objectives and data collection methods to systematically address the research questions.

Research Approach
The study follows an exploratory and descriptive approach:

Exploratory: To gain initial insights into space-sharing drivers, barriers, and current practices through literature and interviews.

Descriptive: To systematically document and analyze space-sharing practices across universities through surveys, and interviews.

Phases in Research Design
1. Literature Review Phase

Objective: To establish a theoretical framework by synthesizing existing knowledge on space-sharing practices in higher education, focusing on factors like collaboration, real estate management, sustainability, and space utilization.

Methods: Systematic review of academic journals, reports, policy papers, and institutional studies.

Expected Outcome: A literature review that highlights key concepts, gaps, and existing models relevant to space-sharing practices.

2. Questionnaires Phase

Objective: To gather broad quantitative insights from Dutch universities on their space-sharing practices, institutional policies, and operational strategies.

Methods: Design and distribution of a survey across 14 participants from seven Dutch universities of the Campus NL's network. The survey includes both closed and open-ended questions on space-sharing types, motivations, financial aspects, and barriers.

Expected Outcome: A large dataset capturing current space-sharing practices and institutional priorities across multiple universities.

3. Interviews Phase

Objective: To explore space-sharing practices in greater depth through qualitative interviews with asset managers.

Methods: Semi-structured interviews with 7 asset managers or educational experts, based on the results of the survey. Interview questions will cover drivers, operational challenges, financial implications, and institutional priorities.

Expected Outcome: In-depth qualitative insights that complement the quantitative survey results and provide contextual depth to space-sharing practices.

4. Cross-Research Analysis Phase

Objective: To integrate findings from the literature review, survey responses, and interviews for comparative analysis and identify patterns, trends, and gaps.

Methods: Conduct thematic analysis of interview data, statistical analysis of survey responses, and comparative analysis of case studies.

Expected Outcome: A synthesis report that integrates theoretical insights with empirical findings, highlighting best practices, operational gaps, and actionable recommendations.

Research Design Components

Data Collection Methods

Quantitative Data: Surveys distributed via Campus NL, capturing broad trends and practices.

Qualitative Data: Semi-structured interviews providing deep insights into the operational, legal, and strategic aspects of space-sharing.

Data Analysis

Quantitative Analysis: Statistical analysis of survey responses to identify trends, commonalities, and differences in space-sharing practices.

Qualitative Analysis: Thematic analysis of interview transcripts to explore motivations, operational challenges, and strategic responses.

Sampling

Universities: A diverse sample of all universities across different regions in the Netherlands, ensuring representation of varied institutional contexts.

Stakeholders: Interviews with asset managers

Validation and Triangulation: Cross-referencing findings from different data sources (survey, interviews, case studies) to ensure reliability and validity.

Phase	Objective	Methods	Data Collection	Expected Outcome
Phase 1	To conduct a comprehensive literature review to understand drivers, barriers, and dynamics of space-sharing practices in universities.	- Systematic literature search- Data extraction from academic sources	- Review of academic journals, reports, institutional documents	Key themes and gaps identified from existing literature.
Phase 2	To collect broad quantitative data on space-sharing practices across Dutch universities.	- Online survey design- Distribution via Campus NL	- Survey responses from all universities	Quantitative insights into space-sharing strategies and financial implications.
Phase 3	To conduct in-depth qualitative interviews with key stakeholders to explore motivations, barriers, and strategies.	- Semi-structured interviews- Focused discussions with administrators and planners	- 10–15 semi-structured interviews with asset managers	Deep qualitative insights into operational and strategic aspects of space-sharing practices.
Phase 4	To integrate findings from literature, surveys, and interviews to identify trends and actionable recommendations.	- Thematic and statistical analysis- Comparative analysis of cases	- Combined data from literature, surveys, interviews, and case studies	A synthesis report with evidence-based insights, highlighting best practices and institutional gaps.

2.4 Research methods

The combination of exploratory and descriptive methods is well-suited for this research because it addresses both the need to uncover initial insights and to systematically document and analyze space-sharing practices. Each approach aligns with specific objectives and phases of the study, ensuring that the research is both comprehensive and methodologically rigorous.

The exploratory method is particularly effective in this study because space-sharing in universities is a relatively new and underexplored area. Exploratory research allows the investigation to identify key drivers, barriers, and practices through literature and interviews, serving as a foundation for the study. As Stebbins (2001) argues, exploratory methods are ideal for gaining a preliminary understanding of phenomena that lack a substantial body of existing knowledge. This approach helps the study to identify critical themes, conceptual frameworks, and gaps, which are crucial for designing subsequent phases like surveys and interviews.

The descriptive approach complements the exploratory phase by enabling systematic documentation and analysis of space-sharing practices across universities. According to Babbie (2020), descriptive research is essential for capturing patterns, trends, and detailed insights into specific phenomena. By using methods such as surveys, case studies, and interviews, the study can generate a detailed picture

of institutional policies, operational strategies, and challenges associated with space-sharing. This approach ensures that findings are not only exploratory but also actionable and relevant to a broad audience.

2.4.1 Proposed Research Methods

Literature Review

The literature review establishes a theoretical framework and identifies existing knowledge and gaps. A systematic review of academic and institutional sources ensures rigor and relevance. Petticrew and Roberts (2006) argue that systematic reviews are critical for synthesizing existing knowledge and setting the stage for empirical studies. This phase ensures that the research is grounded in theory and addresses relevant dimensions like collaboration, sustainability, and space utilization.

Questionnaires

The use of surveys provides broad quantitative insights into space-sharing practices across universities. Surveys are effective for capturing a wide range of data, such as institutional policies, motivations, and barriers, from a diverse sample of universities. This phase ensures the collection of standardized data that can be statistically analyzed to identify trends and commonalities, as emphasized by Groves et al. (2009).

Interviews

Semi-structured interviews allow for an in-depth exploration of qualitative aspects, such as operational challenges and institutional priorities. This method is particularly useful for understanding complex and context-specific issues (Kvale & Brinkmann, 2015). By engaging directly with key stakeholders, the research gains deeper insights into the nuances of space-sharing practices, complementing the broader trends captured through surveys.

Cross-Research Analysis

Integrating data from the literature review, surveys, and interviews ensures a comprehensive analysis. Methodological triangulation, as described by Denzin (1978), enhances the validity and reliability of findings by cross-referencing insights from different sources. This phase allows the research to identify patterns and gaps, ensuring that theoretical and empirical components are aligned.

Synthesis

The final phase consolidates findings into actionable recommendations. The combination of quantitative and qualitative data ensures that the recommendations are both evidence-based and practical. This phase directly addresses the needs of universities by providing clear strategies for improving space-sharing practices, aligning with the principles of applied research.

Survey in collaboration with Campus NL

Surveys conducted with universities provide valuable insights into their perspectives on sharing educational spaces with other institutions. These surveys help understand universities' priorities, challenges, and goals regarding resource sharing, collaboration, and infrastructure optimization. They reveal how shared spaces can influence academic partnerships, foster interdisciplinary learning, and address capacity issues.

Collaboration with Campus NL is particularly beneficial as it brings together expertise and resources from a national network of campuses, promoting best practices. Campus NL's involvement supports

strategic planning, facilitates shared infrastructure development, and encourages innovation in education delivery.

Integrating the survey into the annual Campus NL survey offers consistent data collection for benchmarking and tracking progress over time. It ensures broader participation, provides insights by linking shared spaces to broader campus planning data, and reduces administrative effort for participants. Additionally, being part of a trusted initiative enhances credibility and gives actionable outcomes.

Limitations

The proposed research methodology is thorough and systematic, but it is not without limitations that could influence the outcomes and findings. These limitations span across all phases of the study and should be acknowledged to ensure the results are appropriately contextualized.

Conducting this research through surveys and interviews has several limitations that may impact its outcomes. A significant challenge is the limited generalizability of findings. The results may be specific to the universities and individuals involved, as institutions with varying sizes, funding structures, and missions could face different challenges and opportunities. Furthermore, ensuring a representative sample is difficult, as some perspectives, such as those of students, external partners, or part-time faculty, might be underrepresented, leading to an incomplete picture.

Another limitation is response bias, where participants may provide socially desirable answers rather than reflecting their true views. This could be exacerbated if those opposing space-sharing decline to participate. Additionally, surveys, while efficient, may not capture the depth required to explore complex issues, such as cultural resistance or strategic misalignment, while interviews may be time-intensive and require significant resources to analyze effectively.

Accessing high-level administrators or operational staff with valuable insights might also be challenging due to time constraints or lack of interest. Lastly, participants might withhold critical information, particularly on sensitive topics like finances or regulatory barriers, out of concerns for confidentiality or institutional reputation, limiting the depth of the findings.

In total, five semi-structured interviews and one stakeholder survey were conducted with representatives from Dutch universities and Campus NL. Interviewees held roles ranging from facility coordinators to strategic campus planners. An overview of the interviewees, their institutional roles, and interview moments is provided in Appendix I. These inputs were essential for contextualizing survey outcomes and building the SPACE matrix framework.

The research leveraged the Campus NL network to access relevant stakeholders and institutions across the Netherlands. Campus NL acted as a coordinating intermediary, helping in facilitating the survey and providing the network for inviting participation in interviews. This ensured diversity in university types, sizes, and regional contexts.

Beyond data collection, Campus NL played a guiding role in aligning this research with broader strategic themes in campus management, such as flexibility, efficient use of public assets, and stakeholder coordination. Its involvement helped validate the research approach and increase the practical relevance of findings across the higher education sector.

2.4.2 Data plan

Data Collection

Data Type: The primary data types for this research will include survey responses, interview transcripts, and secondary data from literature, institutional reports, and Campus NL documents.

Survey Data: Quantitative responses from universities on space-sharing practices, barriers, and motivations.

Interview Data: Qualitative data collected from semi-structured interviews with university staff, administrators, and other stakeholders.

Secondary Data: Published research and internal reports provided by TU Delft, Campus NL, and other universities involved in the study.

Collection Method

Surveys will be distributed electronically through Campus NL and TU Delft's networks, using online survey tools such as Qualtrics or Google Forms.

Interviews will be conducted via Zoom or in-person, recorded with participant consent, and transcribed for analysis.

Data Storage and Security

Storage Location: Data will be stored on TU Delft's secure servers, with backups stored in encrypted cloud storage solutions such as TU Delft's OneDrive or other university-approved cloud services.

Access Control: Access to the data will be restricted to the research team, which includes the students and any advisors from TU Delft. Data will be anonymized, and personal identifiers will be removed from interview data to ensure confidentiality.

Security Measures: The research will follow TU Delft's data protection policies, ensuring that all personal and sensitive data is securely handled in accordance with GDPR regulations.

Data Processing and Analysis

Data Cleaning: Survey responses will be reviewed to identify incomplete or inconsistent data. Missing data will be addressed, and any outliers will be flagged for further analysis. Interview transcripts will undergo thematic analysis using qualitative data analysis software like NVivo.

Data Analysis

Quantitative Data: Statistical analysis will be conducted using software like SPSS or R to identify trends in space-sharing practices and barriers across universities.

Qualitative Data: Thematic analysis will be performed on interview transcripts to identify common themes, motivations, and challenges.

Data Sharing and Dissemination

Data Sharing: Anonymized data from surveys and interviews will be shared with the research advisors and collaborators at TU Delft, as well as with Campus NL for further analysis. Aggregated findings will be published in the thesis, presentations, and through academic papers if applicable.

Platform for Sharing: Results and best practices will be shared through a knowledge-sharing platform developed in collaboration with Campus NL, which will be accessible to universities, research teams, and relevant stakeholders.

Data Access: Final anonymized data will be made available through TU Delft's data repository (e.g., TUDelft's Research Data Management platform) or other public repositories like DANS or OpenAIRE, depending on TU Delft's guidelines for data sharing.

Data Retention and Archiving

Retention Period: Data will be retained for a minimum of 5 years after the completion of the thesis, in accordance with TU Delft's data retention policy and funding requirements. After this period, anonymized data will be archived in an open-access repository.

Archiving: All final data will be deposited in a public repository such as TU Delft's Research Data Management platform or DANS to ensure long-term accessibility. This will allow future researchers to benefit from the collected data and findings.

2.4.3 Ethical Considerations

This research on space-sharing practices in Dutch universities will prioritize ethical considerations to ensure the protection of participants' rights and privacy, comply with TU Delft's ethical guidelines, and adhere to data protection laws such as the General Data Protection Regulation (GDPR).

Informed consent is a fundamental aspect of this study. Before participating, all individuals involved, whether survey respondents or interviewees, will receive clear and detailed information about the study's purpose, procedures, and potential outcomes. This information will be provided through a consent form that outlines how data will be used, stored, and protected. Participants will be informed that their participation is voluntary, and they may withdraw at any time without repercussions. Additionally, contact details will be provided for any queries related to the research.

Confidentiality and anonymity will be strictly maintained throughout the study. Identifiable information will be removed from survey responses and interview transcripts, and any personal data will be securely stored with restricted access. The research will ensure that no individual can be identified through the findings, and pseudonyms will be used in reporting. Sensitive information shared by participants during interviews will be handled with particular care and will only be included in the final report if agreed upon by the participant.

While the research is not expected to involve high-risk data, participants will be reminded that they are not obligated to answer any questions that make them uncomfortable. Any data that could be considered sensitive will be anonymized or aggregated as necessary.

Before starting the data collection, the research will undergo an ethical review by TU Delft's Ethics Committee, ensuring that the study follows ethical guidelines. This review will cover participant recruitment, data management, and confidentiality measures, and adjustments will be made as needed based on their feedback.

The research will also comply with TU Delft's data retention policies, ensuring that data is stored securely and disposed of after the required retention period.

Part III – Theoretical Framework

This part explores the theoretical foundations that support the research. It introduces key concepts such as the Solid-Liquid-Gas framework, campus real estate perspectives, and models for shared space typologies. It also examines relevant literature on trends in higher education, institutional challenges, and cross-organizational collaboration. These theoretical insights provide an analytical lens through which the empirical findings will later be interpreted and help define the structure of the S.P.A.C.E. matrix developed in the later parts of this report.

3. Literature review

The evolving landscape of higher education has prompted universities to rethink their spatial configurations. Shared spaces, defined as multipurpose environments that accommodate diverse users and activities, have become central to campus planning. These spaces address critical institutional challenges, including budget constraints, sustainability goals, and the demand for hybrid learning environments. This paper examines the role of shared spaces in universities, highlighting their ability to adapt to emerging trends, optimize resource utilization, and foster collaboration.

3.1 Defining Shared Spaces

When sharing educational spaces with third parties, it is crucial to consider the specific types of spaces available and their suitability for external use. Universities contain a diverse range of spaces, including lecture halls, laboratories, study areas, libraries, and co-working hubs, each serving a distinct educational function. Some spaces, such as large auditoriums, offer high flexibility for hosting events and conferences, while specialized practicums and exam halls may have limited sharing potential due to security, equipment, or academic scheduling constraints. This sharing potential is explained per type of educational space in the part below.

Lecture hall:
Lecture halls are large halls designed for traditional classroom-based instruction. They often feature fixed seating arrangements, such as amphitheater-style layouts or flat layouts with movable seating. These spaces can also include specialized classrooms or medical education rooms with facilities for patient-based learning. According to Alexandra den Heijer (2024) and *Campus NL*, the sharing potential of Lecture halls is high due to their versatile layout, enabling flexible use for various educational and non-educational activities when not scheduled for lectures.

Practicum:
Practicum spaces are specialized areas designed for hands-on, practical education. These include general practical labs, labs with advanced equipment, computer-based practicums, and drawing rooms. Sharing potential is moderate because of the specific equipment and safety protocols required, though spaces like PC practicums offer more flexibility.

Group workroom:
Group workrooms are interactive spaces for group work and collaborative learning. These range from simple group rooms without specific equipment to studios or ateliers with specialized equipment. The sharing potential is high due to the flexible setup and the increasing trend toward active, team-based learning environments highlighted in *Campus NL*.

Study room/space:
These are self-study areas designed for individual learning, including general study spaces, PC-equipped study rooms, single-person study booths, and graduation workspaces. Sharing potential is moderate since these spaces cater to personal study habits, though the flexible nature of PC study rooms supports shared use.

Library:
Libraries encompasses reading rooms and storage areas for educational resources. Sharing potential is high as libraries serve as communal knowledge hubs, encouraging collaboration while offering quiet study zones. *Campus NL* emphasizes the evolving role of libraries as dynamic, multi-purpose learning spaces.

Supportive teaching space:

These support spaces include storage for educational materials, media production rooms, technical rooms, and preparation areas for scientific experiments. Sharing potential is moderate because these rooms support specific functions, though media and technical rooms can be scheduled for shared use among different departments.

Examination room:

examination rooms are exam halls designed for conducting assessments. Sharing potential is low due to strict scheduling tied to academic calendars and the need for secure environments. However, *Campus NL* notes opportunities for repurposing these spaces for training or workshops outside exam periods.

3.2 Trends and organizational challenges

In the context of this thesis, understanding the evolving dynamics of campus space management is crucial, particularly as universities are facing an increasing level of uncertainty in both the demand for and supply of space (Den Heijer et al., 2016; Kocken, 2024). The complexity of this issue arises from various external factors such as shifting educational needs, financial constraints, and sustainability goals. To address this, the four perspectives of Campus Real Estate (CRE) management, organizational, functional, financial, and physical (figure 4) are used as a comprehensive framework for analysis.

Organisational
Internationalisation •
Unpredictable student numbers •
Decrease in long-term research •
Temporary staff contracts •
Interdisciplinary collaboration •

Financial
• Decreased public funding
• Increased academic competition
• Increased academic capitalism

Uncertain demand and supply for space on campus.

Functional
Personal learning •
Flexible learning environment •
Small-scale education •
Hybrid working •

Physical
• Environmental restrictions
• Sustainability goals
• Resource efficiency

Figure 4: Trends creating uncertain demand and supply for space on campus (Kocken, 2024)

Organizational Perspective: University policies, particularly related to internationalization, research unpredictability, and shifting educational dynamics, drive changes in space demand. The international student population is growing, but political factors, such as debates in the Netherlands, might influence this trend (OECD, 2007; Valks et al., 2021). Research funding changes and the increasing need for interdisciplinary collaboration are also impacting space requirements for research (Den Heijer et al., 2016; Parti & Szigeti, 2021).

Functional Perspective: User needs, including those of students, faculty, and researchers, reflect a shift towards flexible learning and working environments, accelerated by the COVID-19 pandemic. Universities are increasingly accommodating flexible workspaces, shared research facilities, and interdisciplinary teaching models (Van Sprang et al., 2019; Den Heijer et al., 2016). This trend includes

evolving student demographics, changing educational methods, and the need for adaptable workspaces (Campus NL, 2016; Beckers et al., 2015).

Financial Perspective: Universities face financial pressures due to funding cuts, competition, and increasing student numbers, which demand efficient space utilization. The shift toward private-public funding models and academic capitalism further challenges campus space management (Curvelo Magdaniel et al., 2018; Rytkönen et al., 2017). Efficiency in space use, like addressing underutilization of lecture halls and workspaces, has become essential (Valks et al., 2021).

Physical Perspective: Universities are pursuing sustainability goals by adopting energy-efficient building practices, such as using circular materials and obtaining high sustainability certifications (Den Heijer, 2021; IPCC, 2023). A focus on reducing campus footprints and promoting shared and flexible spaces supports these goals, contributing to the broader agenda of climate-resilient urban development.

These developments point to the growing need for flexible, shared, and multifunctional spaces on campus, influenced by financial, social, and environmental factors. As a result, campus managers are increasingly looking for adaptable solutions to meet changing needs, emphasizing collaboration and efficiency across various functions (Den Heijer et al., 2016).

3.2.1 Drivers and barriers of governmental buildings

Tim van der Vlist's master thesis (Van der Vlist, T, 2023) explores the dynamics of sharing spaces with third parties, highlighting the key drivers and barriers that influence the decision-making process with focus on governmental buildings. The thesis examines how sharing spaces can offer various benefits, such as cost savings and fostering collaboration, while also addressing the challenges that arise, including security concerns and financial uncertainties. By evaluating these drivers and barriers, the thesis provides a comprehensive framework for understanding the complexities of space-sharing arrangements that helps understanding sharing spaces in educational contexts. The following list outlines these critical factors that institutions must consider when looking for potential partnerships and space-sharing initiatives.

Drivers of Sharing Spaces:

1. **Cost Efficiency:** Sharing real estate can lead to significant cost savings on space, ICT, and facilities. For example, government entities can collectively save large sums by collaborating on housing solutions.

2. **Optimizing Vacant Space:** Many public organizations struggle with low occupancy rates and sharing helps make better use of underutilized spaces.

3. **Fostering Collaboration:** Sharing spaces, especially between similar institutions like universities, promotes networking, knowledge exchange, and collaboration.

4. **Flexibility:** Organizations can respond better to fluctuating space demands, such as short-term projects or temporary increases in staff.

5. **Public Value Creation:** Sharing government real estate can add public value by enhancing urban liveliness and integrating public functions into city spaces.

The drivers about cost efficiency, optimizing vacant space, relate to reducing the negative effect of having space and using it well. Fostering collaboration and public value creation relate to creating more positive effects by implementing a business and social factor. Flexibility is in the middle as it is

positive to have with short-term projects, but when there is a decrease in staff, it falls under vacant space not getting used. Also, when reflecting these terms of Tim, they align with uncertainties found by Maik. Such as efficiency in usage, flexibility in how to use the spaces, and working cost efficiently because of the use of public fundings.

Barriers to Sharing Spaces:

1. **Security Concerns:** The most prominent barrier, including physical security, data protection, and controlling access to sensitive areas.

2. **Core business:** The difference in core business can be too big and make it difficult to share. It should not harm the housing of students.

3. **Financial Uncertainty:** Challenges around who pays for what, unclear financial responsibilities, and contractual complexities.

4. **Loss of Control:** Fear of losing control over office spaces, especially in terms of management, maintenance, and long-term availability.

5. **Connection to working environment:** The main stakeholders that the spaces are meant for need to feel the connection with their working environment. Sharing could diminish that feeling.

6. **Organizational Culture:** Resistance to change, desire for autonomy, and attachment to "own" spaces limit willingness to share.

7. **Image Concerns:** Potential negative impact on an organization's image when sharing spaces with certain partners.

8. **Comparability Issues:** Differences in operational needs and security protocols that make sharing impractical.

9. **Property Management Complexities:** Unclear responsibilities around managing shared facilities can lead to conflicts and inefficiencies.

The Barriers can also be divided into certain levels. The core business, connection to working environment, and organizational culture are about the negative effect it can have on its students and teachers. Security concerns, financial uncertainty, comparability issues, and property management complexities relate to the third parties the collaboration will take part with. Bringing them in and that results in these issues that the university needs to be aware of. When comparing the barriers with the uncertainties of Maik, it is noticeable that the organizational and physical perspectives are represented in these terms.
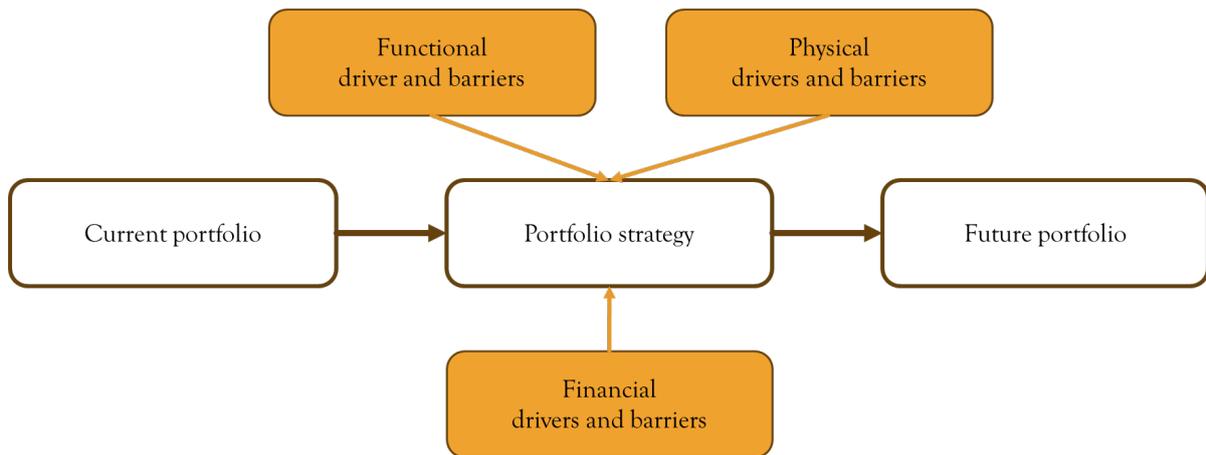
Figure 5: Conceptual Framework adapted to theory (Own work, based on Den Heijer 2016; Kocken 2024)

3.3 The Solid-Liquid-Gas Framework

A key theoretical perspective on shared spaces is Alexandra den Heijer's solid-liquid-gas framework, which categorizes physical environments based on their degree of flexibility and adaptability. This theory provides a conceptual tool for understanding how spaces can evolve to meet changing demands (figure 6).

Solid Spaces: Solid spaces are designed for specific, specialized functions, such as laboratories, lecture halls, or libraries. These spaces are static and not easily repurposed. Den Heijer highlights that while these environments are essential for stability and specialized activities, their rigidity limits adaptability. Over-reliance on solid spaces can lead to underutilization when demands change.
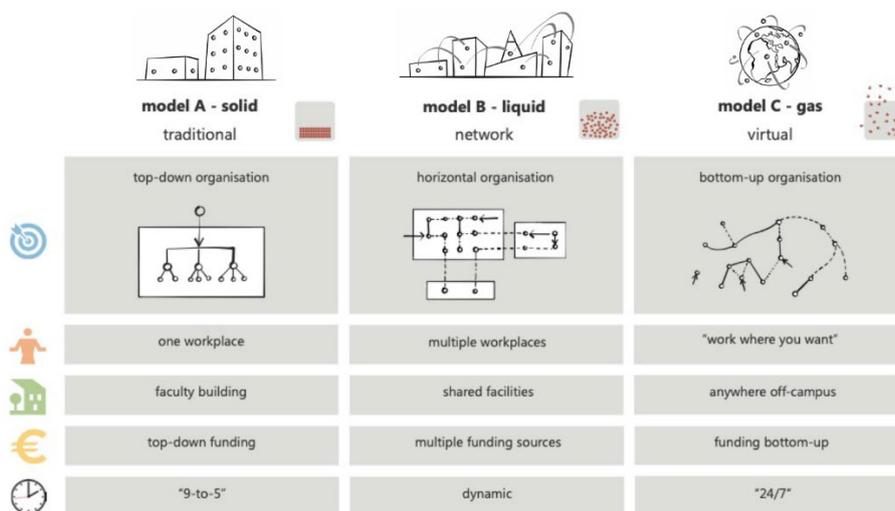
Figure 6: Solid, liquid, gas-model (Den Heijer, 2011)

Liquid Spaces: Liquid spaces, in contrast, are flexible and multi-purpose. Examples include open-plan offices, co-working areas, and multipurpose rooms. Den Heijer argues that liquid spaces are critical for modern campuses, fostering collaboration, creativity, and interdisciplinary interaction. They can be reconfigured quickly and easily, making them ideal for shared use. This aligns with Kocken's emphasis on comfort and versatility in shared space design.

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Gas Spaces: Gas spaces transcend physical boundaries and are facilitated by digital platforms. These virtual environments enable remote learning, online collaboration, and global connectivity. Den Heijer emphasizes that gas spaces complement physical spaces by offering unparalleled flexibility and scalability. The rise of hybrid learning and remote work has further underscored the importance of integrating gas-like capabilities into campus planning.

Integration of the Framework

Den Heijer's framework encourages campus managers to view space as a continues, balancing solid, liquid, and gas elements based on organizational needs. For example:

- **Solid spaces** provide stability for specialized activities like scientific research.

- **Liquid spaces** adapt to diverse, interdisciplinary uses.

- **Gas spaces** extend the reach of education and collaboration beyond physical boundaries.

Future Directions

The integration of solid, liquid, and gas elements represents a promising direction for the future of shared spaces. As campuses and public institutions continue to evolve, the ability to adapt to changing demands will be critical. Emerging technologies, such as smart building systems and virtual collaboration tools, will play a key role in enhancing the functionality and accessibility of shared environments.

Kocken's emphasis on stakeholder engagement and continuous adaptation, combined with van der Vlist's focus on overcoming barriers, provides a roadmap for achieving sustainable and effective shared spaces. Den Heijer's theoretical framework further enriches this perspective, offering a comprehensive model for understanding and managing the complexities of shared space design.

3.4 Matrix: Types of Spaces, Levels of Sharing, Drivers, and Barriers

The next step in the research is to find the relation between the types of educational spaces and their potential level of sharing, and the reason for the university to share this, in this report stated in the drivers and barriers. In research of *Campus NL,* it has already been researched what the potential level of the different types of educational spaces has. The combination of the findings of Campus NL, Alexandra den Heijer, and Tim van der Vlist give a framework to work with when going to the universities to get their input. With this input, it is possible that a comparison can be made between the type of educational space and what drives or withholds a university to do so. Then by ranking these to the potential of these spaces based on research, a conclusion can be made on what can and what is.

This comparison will be called The Shared Educational Spaces Matrix. It serves as a foundational tool for conducting a comprehensive study on how universities in the Netherlands share educational spaces with third parties. By categorizing different space types, assessing their sharing potential, and identifying key drivers and barriers, the matrix provides a structured approach to analyzing space utilization across multiple institutions.

Data Collection and Application

To conduct a full research study, universities across the Netherlands can be surveyed or interviewed using the categories outlined in the matrix. The data collected, such as the frequency of sharing,

types of third parties involved, and perceived benefits and challenges, can be systematically recorded in the matrix.

Each university's responses can be mapped onto the matrix, allowing researchers to identify patterns and trends in space-sharing practices. The results will represent:

- **Extent of space sharing**: How frequently certain types of spaces (e.g., libraries, labs, study rooms) are shared with third parties.

- **Types of collaborations**: The nature of third-party partnerships, including businesses, government agencies, cultural institutions, and other educational entities.

- **Challenges and facilitators**: Common barriers to space sharing, such as security concerns or financial constraints, and the key drivers that encourage collaboration.

By systematically filling in the matrix with data from different universities, researchers can compare institutional strategies, measure the impact of shared spaces, and develop recommendations for optimizing collaboration between academia and external stakeholders. This approach ensures a comprehensive and standardized analysis of space-sharing practices across Dutch universities.

The use of a matrix in research provides a structured and systematic approach to organizing, analyzing, and interpreting data. A matrix enables researchers to compare information across multiple variables, facilitating the identification of patterns and relationships within the dataset. This method has been widely recognized for its efficacy in critical appraisal and systematic reviews, as it allows for a visual representation of findings, aiding in the synthesis of complex information (Stevens, 2024).

Type of Educational Space	Sharing potential	Key Drivers	Barriers
Lecture hall			
Practicum			
Group workroom			
Study room/space			
Library			
Supportive teaching space			
Examination room			

3.5 Types of Third Parties for Sharing Educational Spaces

The involvement of third parties in university spaces offers a wide range of benefits. Collaboration with other educational institutions enables academic exchanges and joint programs, broadening students' learning experiences and promoting international knowledge sharing (Leiden University, n.d.). Research organizations bring specialized expertise, fostering advanced scientific inquiry and facilitating access to funding (Leiden University, n.d.). Government bodies, non-profit organizations, and private companies create opportunities for universities to apply their research to real-world problems, engage in policy development, and create meaningful societal impact (TU Delft, n.d.). Moreover, partnerships with community groups and international organizations allow universities to

connect with local and global communities, driving civic engagement and addressing global challenges (Leiden University, n.d.).

The types of third parties involved also influence how sharing occurs, as discussed in the section on drivers and barriers. For example, private companies may prioritize innovation and market potential, while non-profits may focus more on social value and community outreach. Understanding these dynamics is crucial to designing effective shared spaces. The next step for the research matrix is to quantify these third-party types, capturing their distinct characteristics and contributions to better assess their impact on space-sharing dynamics.

Other Educational Institutions (e.g., universities, colleges):

Dutch universities form partnerships with national and international educational institutions to exchange knowledge, offer joint programs, and provide students with diverse academic experiences. For instance, Vrije Universiteit Amsterdam collaborates with other universities to enrich education and research (Partnerships - Vrije Universiteit Amsterdam, z.d.).

Research Organizations:

Collaborations with research organizations enable universities to access specialized expertise, secure funding, and enhance research output. Leiden University partners with various organizations, including research institutes, to advance scientific knowledge. (Partnerships - Leiden University, z.d.).

Government Bodies:

Engagements with government bodies allow universities to contribute to policy development, public administration training, and societal solutions. TU Delft aligns its research with national science and innovation agendas, collaborating with government institutions to address societal challenges. TU Delft

Non-Profit Organizations:

Partnerships with non-profit organizations facilitate community engagement, service learning, and social responsibility initiatives. Leiden University collaborates with civil society organizations, NGOs, and charities to address societal issues (Partnerships - Leiden University, z.d.).

Private Companies:

Collaborations with private companies foster innovation, provide practical training, and support research commercialization. TU Delft works with private and social partners to develop strategic partnerships in various fields. (National cooperation - TU Delft, z.d.).

Community Groups:

Engagements with community groups allow universities to address local needs and promote civic engagement. Leiden University partners with local organizations to enhance community well-being (Partnerships - Leiden University, z.d.).

International Organizations:

Collaborations with international organizations enable universities to contribute to global challenges and provide students with international perspectives. Leiden University participates in Una Europa, a network of leading European research universities, to shape a virtual European university (International collaboration - Leiden University, z.d.).

By quantifying these types of spaces, it adds an extra dimension in the matrix to compare. Below is the complete version that will be used for this research:

Type of Educational Space	Sharing potential	Drivers	Barriers	Type of third party
Lecture hall				
Practicum				
Group workroom				
Study room/space				
Library				
Supportive teaching space				
Examination room				

3.6 The Gap

The gap this research aims to fill lies at the intersection of space management, institutional collaboration, and higher education resource optimization, specifically regarding the sharing of educational spaces between universities. While previous studies have explored topics like campus management, space utilization, and partnerships with external organizations, there is limited research focusing exclusively on how universities can share spaces with other educational institutions to enhance resource efficiency and align with strategic goals.

Limited research on collaboration in educational space-sharing: Most studies emphasize partnerships between universities and businesses or community groups, leaving a lack of insight into the specific dynamics of collaboration when talking about sharing educational spaces. The processes, barriers, and opportunities unique to such partnerships remain underexplored.

Barriers to practical implementation: While general frameworks for campus resource optimization exist, they often fail to address the operational, cultural, and regulatory challenges that hinder universities from implementing shared-use practices effectively. This research seeks to uncover these barriers and provide actionable strategies tailored to educational institutions.

Alignment of space-sharing with strategic goals: Existing literature does not adequately address how universities can integrate space-sharing initiatives with their educational, research, and financial objectives, ensuring that these practices do not disrupt academic priorities but rather support them.

Lack of evidence-based models: Few studies provide detailed, evidence-based models or frameworks that universities can use to establish and manage space-sharing arrangements with other institutions. This research will contribute practical tools and insights to fill this void.

3.7 Social Dimensions of Inter-University Space-Sharing

The social aspects of inter-university space-sharing are critical to understanding the feasibility, challenges, and broader implications of such initiatives. Beyond operational and financial considerations, the success of shared educational spaces is heavily influenced by the cultural, relational, and community dynamics between collaborating institutions. This section examines the key social dimensions and their relevance to the research.

Collaboration and institutional relationships

Effective space-sharing depends on fostering strong relationships between universities. Trust, open communication, and mutual understanding are foundational to creating partnerships that align with shared goals (Den Heijer, 2011). However, universities often operate within competitive environments, and perceived power imbalances or rivalries may deter collaboration (Kocken, 2024). Building inter-institutional trust requires transparent agreements, shared governance mechanisms, and an emphasis on mutual benefit, ensuring that both parties feel equally valued in the partnership.

Cultural alignment and resistance

Institutional culture plays a significant role in shaping attitudes toward space-sharing. Universities often prioritize their educational and research missions, which may lead to resistance against perceived disruptions caused by shared use (Curvelo Magdaniel et al., 2019). Faculty and staff may worry that such arrangements could compromise the academic integrity of spaces or diminish their availability for core institutional functions. To address this, shared initiatives must align with the cultural values of each institution while fostering a collaborative mindset that emphasizes the advantages of resource sharing.

Student and stakeholder engagement

Inter-collaborations in space-sharing create opportunities for meaningful interactions between students, faculty, and staff. Shared spaces, such as libraries or recreational facilities, can facilitate cross-institutional networking, knowledge exchange, and innovation. This can enrich the student experience and foster a sense of community that extends beyond individual institutions (Kocken, 2024). Furthermore, considering the needs of middle school students—who will eventually become the next generation of university students, it adds a forward-looking dimension to these initiatives. Engaging with younger students through outreach programs, joint educational events, or campus tours within these shared spaces can provide them with a sense of belonging and investment in the university system. This early exposure may inspire greater academic ambition and stronger ties to higher education, potentially improving future enrollment rates and student success.

By addressing these social dimensions, inter-university space-sharing initiatives can move beyond logistical efficiency to foster positive relationships, inclusivity, and community-building. Furthermore, integrating middle school students into the conversation as future university participants enhances the long-term social sustainability of space-sharing initiatives. The research seeks to explore these dynamics further, providing insights into how universities can overcome cultural resistance, build trust, create equitable partnerships, and engage the next generation of students in meaningful ways.
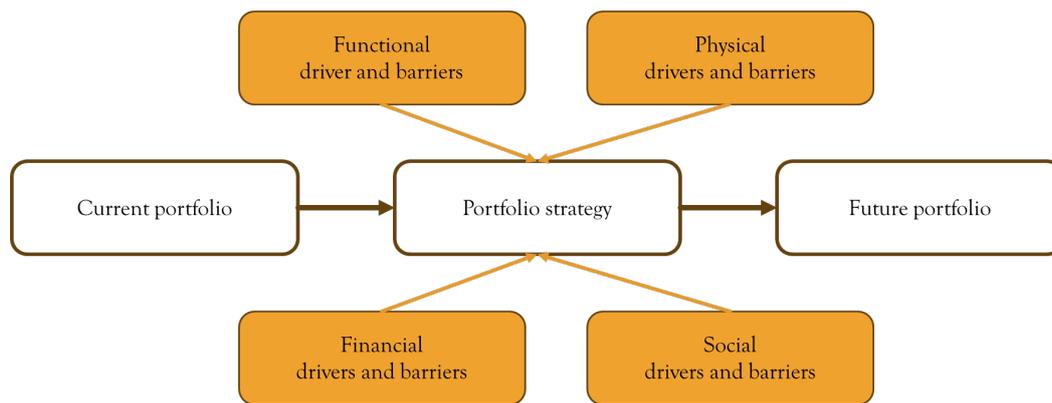
Figure 7: Final conceptual framework (own work)

3.8 From Literature to Survey Design: Thematic Synthesis of Key Concepts.

The literature review uncovered a broad and diverse set of drivers, barriers, space types, and third-party actors related to the sharing of educational spaces. These categories were derived from various disciplinary perspectives, campus management (Den Heijer, 2011), governance and strategy (Kocken, 2024, Vlist, 2023) However, to translate these academic insights into a usable survey instrument, a structured thematic synthesis was necessary.

Barriers and Drivers → Factors

For instance, Kocken (2024) and Vlist (2023) describe numerous operational and cultural factors, such as fragmented planning, decentralized scheduling, or unclear governance. These align under the umbrella of **"Use"**, reflecting practical feasibility. Similarly, they refer to budget control, cost recovery, and investment risk, all of which are bundled into **"Finance"**.
Themes like safety protocols, data security, and liability (Temple, 2008) are grouped under **"Safety"**, while references to partnerships, cross-institutional collaboration, and knowledge ecosystems fit within **"Collaboration"**. Finally, factors such as institutional reputation, cultural fit, and educational identity are grouped under **"Identity"**, a theme discussed by Kocken (2024) as key to the perceived appropriateness of space-sharing.

Types of Third Parties → Clustered Groups

The literature names a wide range of potential third-party users: start-ups, NGOs, companies, regional governments, sister universities, research spin-offs, EU agencies, etc. These were grouped into five categories, each reflecting distinct logics of engagement:

- **Other educational institutions** (e.g., HBO/MBO, universities) – sharing for academic synergy

- **Other research institutions** (e.g., labs, research centers) – shared R&D ecosystems

- **Governmental parties** (e.g., municipalities, ministries) – civic integration and regional roles

- **Private parties** (e.g., businesses, start-ups) – innovation and valorization partners

- **International organisations** – global research networks or policy bodies

These clusters reflect recurring actor types in spatial policy documents (Campus NL, 2022), governance literature (Kocken, 2024), and strategy papers (OECD, 2007).

Types of Spaces → Consolidated Categories

Space types mentioned in literature range from lecture halls and seminar rooms to maker spaces, study zones, learning commons, and flex offices. However, these often fall under broader operational categories recognized across institutions. For analytical clarity and to ensure respondent familiarity, four umbrella types were chosen:

- **Lecture halls** – formal instruction spaces

- **Practice rooms** – spaces for small group teaching or skill-based learning

- **Self-study rooms** – informal or quiet study spaces

- **Library** – institutional knowledge and learning support facilities

These categories resonate with spatial typologies from Den Heijer (2011) and Van den Brink et al. (2017), which are commonly used in campus planning practice.

3.9 Expanding the Academic Perspective on Sharing Educational Spaces

The practice of sharing educational spaces between universities and third parties has gained increased attention in recent years. It is not only a response to financial or spatial inefficiencies but part of a broader transition toward multifunctional campus environments. While the previous sections introduced key frameworks from Den Heijer, Kocken, and Van der Vlist, this section expands the academic foundation with additional literature that supports the relevance and urgency of this topic.

3.9.1 From real estate to campus ecosystems

Temple (2008) describes the campus as more than a collection of buildings. It is a place that shapes institutional identity and performance. This perspective highlights that decisions about space sharing are not neutral, they influence how a university is perceived by staff, students, and society. Similarly, Den Heijer (2011) emphasizes that campus decisions must align with both short-term operational needs and long-term strategic value. Her solid–liquid–gas framework provides a useful lens to evaluate how flexible or fixed a space is, and how that affects its potential to be shared.

Bennett (2007) builds on this by noting that the physical design of a space impacts behavior. Traditional academic environments often reinforce hierarchical and exclusive use, while more flexible spaces—like group workrooms or libraries, can invite more inclusive and shared practices. These ideas help explain why some universities in this research are more willing to share certain spaces (e.g. lecture halls) than others (e.g. practicum labs).

3.9.2 Time sharing as a strategic principle

The *Campus of the Future* report (Rijksvastgoedbedrijf, 2021) introduces a helpful distinction between three types of space sharing:

- **Spatial sharing**: multiple parties in the same location.

- **Functional sharing**: different users with a common purpose.

- **Time sharing**: use of the same space at different times.

This research primarily focuses on *time sharing*, as it represents one of the most practical and underused opportunities for universities to improve space utilization without compromising core academic functions. Examples include lecture halls made available in evenings, or study rooms opened to partner institutions during weekends. These findings were confirmed during the interviews.

Jamieson (2003) supports this by stating that campuses should be designed with multi-use flexibility in mind, especially if they aim to support new forms of teaching, learning, and collaboration. Den Heijer and Valks (2021) similarly advocate for dynamic timetabling systems to enable such flexible use, while also stressing the need for organizational coordination.

3.9.3 Cultural resistance and governance barriers

Cultural resistance remains one of the most cited barriers to structural space sharing. Faculty and staff often feel protective of their teaching environment and worry that external users may interfere with quality or scheduling. These concerns were echoed in several interviews. Kocken (2024) refers to this as a "perceived loss of control," which must be addressed through clear internal communication and centralized policies.

A related issue is the lack of institutional coordination. Many Dutch universities operate under decentralized space management, where faculties control their own teaching rooms. This was also found in the interviews. Without a shared governance structure or a dedicated team (e.g. Campus & Community), space-sharing arrangements often stay ad hoc and unaligned with institutional goals.

Van der Vlist (2023), who researched shared use of government buildings, identified similar issues:

- Lack of trust and mutual understanding.

- Unclear agreements about maintenance or cost distribution.

- Concerns over identity and security.

These insights suggest that the barriers Dutch universities face are not unique, but part of a broader institutional challenge when transitioning to shared environments.

3.9.4 The social value of shared space

Beyond operational efficiency, shared educational spaces can also create public value. Estermann et al. (2015) and Curvelo Magdaniel (2018) show that campuses are increasingly being seen as ecosystems, where students, researchers, businesses, and communities can interact.

Sharing spaces with third parties, especially in a structured and strategic way, can support societal goals such as:

- Making education more accessible.

- Stimulating innovation and entrepreneurship.

- Reducing environmental impact through higher space efficiency.

These drivers were frequently mentioned in the interviews, particularly by universities that see themselves as part of a regional knowledge network. However, to achieve these benefits, it is crucial that space-sharing practices are supported by tools, policies, and organizational ownership, topics addressed in the following chapters.

Part IV – Empirical Findings and Analysis

This section presents the results of the empirical research, primarily based on interviews with university stakeholders. It identifies recurring patterns, opportunities, and challenges in the practical implementation of shared educational spaces. The findings are categorized using financial, functional, organizational, and social dimensions. The chapter also examines the types of spaces shared, the third parties involved, and how these findings align with or diverge from theoretical expectations. This analysis sets the stage for the development of a strategic framework in the next part.

4. Findings on Stakeholder Surveys and Interviews: Drivers, Barriers & Strategies

Why do universities seek to share educational spaces with third parties?

What are the current strategies for universities in sharing educational spaces?

This chapter presents the findings from surveys and qualitative interviews conducted with asset managers and facility officers from five Dutch universities. The analysis is structured along four dimensions derived from the Campus Real Estate (CRE) framework: Financial, Social, Functional, and Organizational. Each section identifies major themes emerging from the interviews and supports them with direct evidence from participants. Together, the findings reveal how these institutions navigate the practicalities and politics of sharing educational space with external users.

4.1 Observations from Mentimeter survey

Before starting the interviews, a Mentimeter session was conducted with representatives from seven Dutch universities to gain an initial overview of how educational space-sharing with third parties is approached across institutions. The session used anonymous multiple-choice questions to gather input on several aspects, including which types of spaces are shared, which types of third parties are involved, and how often these collaborations take place.

The results showed clear differences between universities. Some participants indicated that their institutions frequently share spaces such as lecture halls, meeting rooms, or libraries, while others reported little to no structural sharing. Specialized spaces such as labs or practicum rooms were rarely mentioned, reflecting that these are generally considered more difficult to share.

Similarly, there was a widespread response regarding the types of third parties. While most universities reported some level of collaboration with other educational institutions, fewer indicated regular partnerships with private companies, government bodies, or cultural and community organizations. The frequency of these collaborations also varied, with some respondents reporting regular or long-term partnerships, while others described their space-sharing activities as incidental or rare.

In addition to the multiple-choice questions, the session included an open-ended question about what was missing in the survey. That was about the challenges of public-private collaboration. The responses to this question highlighted mostly concerns. These insights informed the development of the interview guide, where public-private collaboration was included as a specific topic for further exploration.

The session thus provided a valuable first indication of the diversity in how Dutch universities currently interpret and apply space-sharing practices. It also helped to sharpen the focus of the interviews, ensuring that differences in definitions, frequency, and partner types would be explored in more depth in the next phase of the research.

4.2 Financial Factors

Financial considerations represent both a driver and a barrier in decisions about space sharing. Although several institutions recognize the potential to improve efficiency and reduce costs, the absence of consistent revenue and cost-allocation models often limits structured implementation.

Many universities struggle with the lack of transparent pricing, particularly when sharing space with external users. The participant from University E noted, "We are currently re-evaluating our policy, because facility services like cleaning and security obviously cost money." The participant also highlighted the absence of market-based rates: "We should really be charging market-conform rates to commercial parties, but that's still not systematically applied."

A growing awareness of indirect service costs has led some institutions to introduce internal charging mechanisms. University D has adopted a model to promote resource awareness: "We use an internal cost-allocation system based on square meters to create awareness about space use."

The emerging financial consciousness signals a shift towards more sustainable management, but universities remain in transition. Without formalized pricing strategies, particularly for external parties, financial concerns continue to pose a significant obstacle.

4.3 Social Factors

Social motivations surfaced as a strong and consistent driver across all interviews. Universities identified regional responsibility, accessibility, and public value creation as key rationales for sharing. However, these motivations are sometimes undermined by internal cultural resistance.

University E emphasized its regional mission: "We feel a strong sense of societal responsibility as a university in our region of the Netherlands. We share our lecture halls with the University of Applied Sciences and the municipality when there is demand for it. It's part of our open attitude."

At the same time, cultural concerns about protecting academic space persist. A respondent from University B reflected: "Some lecturers are hesitant. They worry that external users will come at the expense of teaching space."

Several universities also highlighted the symbolic value of sharing. As University A explained, "Sharing space is also a way to make the University accessible to young people who might otherwise never come into contact with science." These social drivers align with the literature on public value, but the interviews make clear that a shift in internal culture is still needed for these ideals to be translated into practice.

4.4 Functional Factors

Functional dimensions, including space typology, scheduling infrastructure, and technological limitations, play a critical role in enabling or obstructing space sharing. The suitability of a space often hinges on its flexibility and the systems in place to manage it.

Specialized rooms were frequently cited as unfit for shared use. As one interviewee from University D noted, "Our lab spaces are difficult to share due to equipment and safety requirements. Only computer labs offer some flexibility." The type of space clearly defines its sharing potential, with high-tech or security-dependent facilities remaining largely off-limits.

Technological constraints in scheduling also emerged as a major theme. University B highlighted this issue: "We have no clear insight into the actual use of our educational spaces. That makes planning difficult." University B added that spatial mismatch is compounded by inadequate systems: "In theory, group workspaces could be perfectly shared, but that requires a dynamic timetable, which we currently don't have."

Even spaces that are nominally shared, like libraries, sometimes revert to internal use under pressure. As University E reported, "The library is shared with other students, except during

University-only weeks. Then, access is restricted." At University D, the limitation of students is similar within the exam weeks of their students. However, the library is besides those periods open to everyone.

These examples show that functional barriers are not just spatial but systemic. Inflexible infrastructure, limited data, and rigid timetables collectively reduce the feasibility of coordinated strategic sharing.

4.5 Organizational Factors

Organizational dynamics, particularly governance models, decision-making authority, and policy coordination, represent the most persistent structural barriers to shared space practices.

Several interviewees described decentralized scheduling as a root problem. As University E explained, "Scheduling is still decentralized. We are working on a central system, but that takes time." University D illustrated the disconnect between departments: "The Facility Services Department has little authority over teaching rooms. That makes us dependent on the faculties."

Without centralized coordination, efforts to engage with third parties remain fragmented. A respondent from University C described this challenge: "There is no central coordination for sharing spaces. That makes it difficult to make structural agreements with external partners. Campus & Community should ideally be responsible for reviewing external requests to use space."

These findings reinforce the notion that governance, more than goodwill or policy ambition, determines the effectiveness of space sharing. Institutions that lack centralized oversight and clear internal responsibilities are less likely to share space systematically or equitably.

4.6 Drivers and barriers revisited

The empirical data aligns with the drivers and barriers outlined by Van der Vlist and Den Heijer. Frequently cited drivers included cost efficiency, optimal use of underutilized space, and the generation of public value. At the same time, barriers such as cultural resistance, decentralized governance, and functional mismatches were clearly echoed across institutions.

Cultural resistance was evident, particularly among academic staff. University B explained, "Some lecturers are reluctant; they fear that sharing will cause scheduling conflicts." A lack of institutional governance also hindered consistent practice. University C noted, "We lack a central policy framework, which leads to different rules and expectations across faculties." The absence of digital coordination tools is further complicated sharing practices. As University B stated, "Without a digital system that makes all spaces visible, efficient sharing remains a challenge." University D added, "Sometimes we don't even know a space is being shared. It happens outside our coordination."

This chapter has shown that Dutch universities are motivated to share educational space, particularly due to financial and social imperatives. However, significant barriers remain at both functional and organizational levels. Financially, institutions are increasingly aware of hidden service costs and are experimenting with internal charging mechanisms, but few have formalized pricing for external users. Socially, universities express a strong commitment to public value, yet cultural resistance, particularly among teaching staff, limits full realization. Functionally, space typology and weak scheduling systems hamper flexibility. Organizationally, decentralized governance and a lack of coordination pose the greatest challenge.

Factor	University A	University B	University C	University D	University E
Financial	High	Low	Low–Moderate	Moderate	Low
Space Use	Moderate–High	High	High	High	Moderate
Safety	–	High	–	Moderate	Moderate
Collaboration	High	Low	High	Moderate	High
Identity	High	Low	Moderate	High	Moderate–High

Figure 8: Findings on CRE level (own work)

5. Types of Third Parties and Shared Educational Spaces

What types of educational spaces are currently shared with third parties?

Who are the current third parties that universities focus on when sharing their educational spaces?

The types of external parties with whom Dutch universities share educational spaces and the specific kinds of spaces they are involved with are mentioned below. Based on semi-structured interviews with facility managers and campus strategists, the findings illustrate the diversity of third-party collaborations and space types, as well as the strategic challenges underlying these practices.

5.1 Types of Third Parties

Educational Institutions

The most structured collaborations are between universities and other educational institutions, such as universities of applied sciences (HBO) and adult education programs. These relationships are often regionally rooted and rely on long-term scheduling agreements.

As University E noted, "Lecture halls are also used by institutions like University of Applied Sciences. For example, we share exam halls with them." University B confirmed: "We work with the local university of applied sciences to share exam rooms. It is a structured collaboration planned annually."

University A's collaborations go beyond incidental sharing. According to a representative: "We have a cooperation agreement with secondary and higher education institutions. It includes a lifelong learning trajectory and the commitment to provide space on campus for WO, HBO, and MBO education."

Municipalities and Public Institutions

Several universities support civic use of educational spaces, offering auditoriums and lecture halls for events hosted by municipalities or public organizations.

University E explained, "The municipality occasionally uses our lecture halls for events, usually free of charge." University B added, "Our student sports center is also used by the municipality for swimming lessons," indicating broader public engagement beyond core education spaces. The University B also noted: "We sometimes organize open days or symposia where external public institutions use our auditorium or foyer."

Non-Profit Organizations and Community Groups

Space-sharing with community initiatives and NGOs is less frequent but reflects universities' commitment to public value.

As University E stated, "We try to offer space to regional initiatives, such as social organizations. This usually happens on an ad hoc basis." University A emphasized that this type of sharing aligns with their campus's civic role: "The campus is open to various societal uses, but we want to ensure alignment with the university's core mission."

Commercial Partners

University A stands out among Dutch universities for its advanced integration of commercial collaboration into its campus model. A lifecycle approach enables startups and spin-offs to operate within university buildings, gradually moving from faculty-based space to dedicated innovation buildings.

"We have companies housed within our faculty building," a University A representative stated. "They collaborate on research with our architecture department but also conduct commercial work." She added, "The building is technically ours, but rented long-term to the company. These arrangements are often made directly by the faculty without involving central real estate management."

Although other universities, such as University D, note occasional commercial use of lecture spaces ("There are occasional commercial events in our auditorium, but these always come with service contracts"), University A structurally incorporates valorization into campus governance. "Knowledge valorization is one of the three core missions of the university, alongside education and research," a University A representative emphasized.

Type of Party	University A	University B	UNIVERSITY C	University D	University E
Educational institutions	Structural	None	Structural + Incidental	Structural + Incidental	Structural
Research organizations	Structural	None	Incidental	Incidental	Indirect (via projects)
Government	Structural (e.g. sport use)	None	Not mentioned	Incidental	Incidental (municipality)
Private sector	Structural (valorization)	None	Rare	Incidental	Rare (case-by-case)

Figure 9: Findings on third parties (own work)

5.2 Types of Spaces Shared

Lecture Halls and Auditoriums

Lecture halls are the most shared educational spaces due to their capacity and flexibility. These are often scheduled outside core teaching hours.

As University E noted, "We share lecture halls with University of Applied Sciences and the municipality when there is demand. They are made available outside scheduled hours." University C emphasized their multifunctionality: "Our auditorium is used for lectures during the day and for conferences or external speakers in the evening." University A highlighted that its Innovation Space, technically a university building, is "used by both student teams and external partners working on prototype development and early-stage businesses."

Exam Halls

Exam halls are occasionally shared with educational partners, particularly during nationally scheduled exam periods.

University E mentioned, "We have fixed agreements with them for the use of exam halls. Use is restricted during University E-only weeks."

Libraries

Libraries are sometimes accessible to students from external institutions. Access is typically conditional.

According to University E, "The library is also accessible to the other students, except during weeks reserved for internal use." University B reported similar practices: "HBO students can access our library, though this access is limited during exam periods."

Group Workspaces and Study Rooms

These spaces are less frequently shared due to internal demand and the inflexibility of scheduling systems.

University B noted, "In theory, group workspaces could be perfectly shared, but that requires a dynamic timetable we currently don't have." University A emphasized that such sharing is considered, especially under the lifelong learning agreements with HBO and MBO, but it remains underused due to logistical constraints.

Specialized Rooms (e.g., Labs and Practicums)

Lab spaces are rarely shared due to equipment, safety, and intellectual property concerns. However, University B represents an exception, embedding shared lab use into their valorization model.

"We're building a new lab facility that is co-financed," said the University B representative. "It's technically an educational facility, but the labs will be used jointly with our industry partners." Still, the university recognizes tensions: "There is always a balancing act, when space is allocated to commercial activity, it may limit availability for education. We are developing a policy to improve oversight and avoid uncoordinated use."

Dutch universities engage in a wide range of space-sharing arrangements, with educational institutions and public bodies. Lecture halls, exam spaces, and libraries are the most shared due to their flexible nature. University B provides a distinctive model, integrating commercial partners through structured valorization processes and long-term partnerships within educational buildings. In contrast, highly specialized facilities such as labs are typically restricted, except where valorization is embedded in institutional policy. These findings suggest that governance structures and strategic priorities significantly shape space-sharing outcomes.

Space Type	University A	University B	University C	University D	University E
Libraries	Structureel (HBO)	Not shared	Incidental (HBO, students)	Semi-public, regulated	Semi-public
Lecture halls	Not mentioned	Not shared	Structureel + incidenteel	Incidental	Shared with HBO + municipality
Practicum rooms	Shared (industry)	Not shared	Not mentioned	Incidental	Not shared
Self-study areas	Conditionally shared	Not shared	Open for HBO/scholars	Conditional access	Limited access for external students

Figure 10: Findings on types of spaces (own work)

6. Connecting Theory and Interview Findings

Building on the typologies from Chapter 7, this chapter connects empirical findings from the interviews with the theoretical frameworks introduced earlier. Specifically, it interprets the practices of sharing educational spaces using the Solid–Liquid–Gas metaphor and the Campus Real Estate (CRE) perspectives. These frameworks offer structured ways to analyze how universities are adapting in response to internal pressures and external partnerships. This chapter emphasizes the alignment, or misalignment, between theoretical expectations and the realities of implementation.

6.1 Strategic Steering based on Governance of Shared Space

A key theoretical foundation for this study is drawn from the work of Kocken (2024), who investigated how Dutch universities can strategically steer the shared use of educational spaces. His thesis, developed at TU Delft, identifies three primary governance models, centralized, decentralized, and hybrid, and explores how each impacts decision-making, scheduling, and third-party access. This research builds on Kocken's insights by translating such governance structures into the five-dimensional S.P.A.C.E. framework, particularly through the dimensions of Strategic Fit, Practicality, and Collaboration. Where Kocken provided a typology and theoretical grounding, the S.P.A.C.E. matrix seeks to assess and compare institutional maturity levels in practice, integrating both governance orientation and operational culture.

6.2 The Solid–Liquid–Gas Framework in Practice

The Solid–Liquid–Gas metaphor captures how universities are evolving in their spatial strategies. Interviewees described this transformation in varying degrees: some institutions still operate within "solid" boundaries, while others embrace "liquid" or even "gaseous" forms of space-sharing.

As shown in figure 11, this shift is visible across four aspects: ownership, functionality, user group, and space use. Notably, shared environments are no longer fixed and mono-functional; instead, they often serve multi-user groups and are increasingly designed for adaptability. The most advanced examples, particularly involving lifelong learning or hybrid education, reveal a move toward "gaseous" use of space, which is more virtual and scalable.

These observations suggest that universities not only change their spatial layouts but also their strategic mindsets regarding openness, control, and cross-institutional collaboration.

Aspect	Solid (Traditional)	Liquid (Flexible/Shared)	Gas (Digital/Hybrid)
Ownership	Faculty-owned and fixed	Shared by multiple faculties or institutions	No ownership – accessed online or ad-hoc
Functionality	Dedicated to one user or purpose	Multi-purpose, reconfigurable	Virtual, asynchronous, or hybrid
Users	Internal only	Internal + selected external	Wider external, including lifelong learners
Space Use	Scheduled, static	Adaptive, on-demand	Non-physical, scalable use

Figure 11: Findings on SLG level (own work)

6.3 CRE Perspectives and Empirical Patterns

The CRE management model (organizational, functional, financial, physical) provides a second lens to assess how space-sharing aligns with campus goals. Figure 12 distills how each dimension manifests in practice.

Organizationally, universities use shared space to foster strategic partnerships and collaborative identity, yet they often lack the governance mechanisms to manage them effectively. Functionally, flexibility enhances educational value but introduces scheduling and user coordination issues. Financial motivations like cost-efficiency and co-investment are real but frequently constrained by public funding rules or limited budgets. Physically, shared use extends the life of existing facilities, though maintenance demands and usability tensions often rise.

These findings demonstrate that successful sharing depends on more than just the availability of space, it requires holistic alignment across all CRE dimensions.

CRE Perspective	Opportunities Observed	Challenges Encountered
Organizational	Strategic partnerships, interdisciplinary identity	No governance framework, resistance to externalization
Functional	Flexible space supports collaborative learning	Scheduling conflicts, lack of user control
Financial	Cost-efficiency, external funding contributions	Initial investment high, legal restrictions on income use
Physical	Higher utilization, delays need for new buildings	Increased wear and tear, complex fit-out needs

Figure 12: Perspective on CRE level (own work)

6.4 Drivers and Barriers Revisited

Table 6.3 revisits key drivers and barriers by dimension, linking theory to lived experience. Drivers include operational efficiency, improved visibility, and broader access through partnerships. Barriers, however, are equally present: internal resistance, regulatory rigidity, and logistical complexity continue to limit implementation.

One of the clearest insights from the interviews is that culture and governance matter just as much as physical infrastructure. While many universities see the potential of space-sharing, realizing it often stalls without institutional alignment, strategic support, and adaptable frameworks.

Dimension	Drivers	Barriers
Organizational	Increased collaboration and visibility	Resistance from departments, unclear roles
Functional	Improved student experience, access to variety of spaces	Conflicting needs, limited flexibility in scheduling
Financial	Revenue generation, shared investment	Budget constraints, regulatory limits on public space use
Social/Cultural	Public good, engagement with community	Concerns over mission drift, unfamiliar partners

Figure 13: Drives and barriers on dimensions (own work)

6.5 Conclusion

This chapter has bridged theory and practice by analyzing interview results through conceptual frameworks. The Solid–Liquid–Gas metaphor helps explain the spectrum of spatial evolution, while the CRE lens reveals how different operational dimensions support or hinder shared space use. The tables Summarize this relationship and provide clarity on the practical implications of space-sharing strategies.

These analytical insights directly inform the development of the S.P.A.C.E. Matrix in the next chapter, a tool designed to help universities assess, compare, and enhance their own space-sharing approaches.

Part V – Strategic Tool: The S.P.A.C.E. Matrix

Based on both theoretical insights and empirical findings, this part introduces the S.P.A.C.E. matrix: a tool designed to support universities in evaluating and planning shared educational spaces. The matrix categorizes dimensions of space-sharing and connects them to drivers, barriers, and levels of institutional control. It is used to visualize and compare case findings and to assist in strategic decision-making. This section explains the structure of the tool, how values were assigned, and how the matrix can be applied in practice.

7. Interpreting the S.P.A.C.E. Matrix

The S.P.A.C.E. matrix offers a structured, qualitative tool for assessing the maturity and character of shared space practices across five critical dimensions: Strategy, Practicality, Accessibility, Collaboration, and Economics. This chapter explains how the qualitative values assigned to each cell in the matrix were derived from the interview data. The matrix serves as a bridge between empirical nuances and theoretical constructs, offering insight into institutional readiness, limitations, and approaches to space sharing.

7.1 Methodology for Assigning Matrix Values

Matrix values were assigned through thematic coding of interview transcripts. Statements from university representatives were mapped to the five S.P.A.C.E. dimensions based on references and meanings concerning institutional policy, logistical execution, governance structures, and financial mechanisms. Each dimension was scored using qualitative indicators such as "strong," "complex," or "low," based on the clarity, consistency, and frequency of relevant themes in the data.

For instance, the respondent from University E stated, "We share lecture halls with the Hanze University of Applied Sciences, usually without compensation," indicating high collaboration but low economic rationale. The participant also remarked, "Scheduling is still organized at the faculty level," which points to complex practicality. Accessibility was described as "semi-open" in the case of shared library use: "The library is accessible to students from Hanze, except during weeks designated exclusively for University E."

This interpretive coding was guided by the analytical matrix developed in prior work by Van der Vlist (2023) and Den Heijer (2016), ensuring consistency and theoretical alignment throughout the assessment process.

7.2 Dimension Interpretations

Strategy

The Strategy dimension captures the degree to which institutional missions actively promote space sharing. Some institutions explicitly link shared use to societal or regional goals, while others remain more internally focused.

At University E, strategy is clearly aligned with an external mission orientation: "Our vision is that knowledge sharing is more important than revenue. We want to strengthen the region through collaboration." In contrast, University B articulated a more inward-looking position: "The university deliberately prioritizes internal space use. External requests are only considered under exceptional circumstances." University A displayed a high level of strategic integration: "Valorization and collaboration with companies are embedded in the DNA of our institution."

Practicality

Practicality relates to logistical and operational feasibility, particularly in terms of scheduling, availability, and spatial flexibility. This domain proved to be the most cited source of friction across institutions.

University D noted, "Each faculty manages its own scheduling. This makes it difficult to accommodate external users." A similar concern was echoed by University C: "There is little central control. Scheduling happens independently, and there is no shared overview." However, signs of progress are

visible, as University E mentioned, "We are working on a central system. It should make it easier to handle external requests efficiently."

Accessibility

Accessibility captures the extent to which university spaces are open to third parties. In some cases, accessibility is conditional or time-bound.

University D reported partial access to library facilities: "The library is partly accessible to external students, but access is restricted during peak exam periods." University C has implemented registration-based access: "Students from other institutions can use our library, provided they register." In contrast, University A offers purposefully open infrastructure: "Some spaces, like the Innovation Space, are intentionally made publicly accessible."

Collaboration

The Collaboration dimension assesses the presence, formalization, and continuity of partnerships with external entities. While some collaborations are structural, others are project-based or ad hoc.

At University E, a strong formal relationship exists: "We have a structural collaboration with University of applied sciences for exam halls. This is coordinated every semester." University C described a more temporary model: "We have made a few spaces available for education, but it's a temporary arrangement." At University A, long-term partnerships with industry are a strategic pillar: "Collaboration with companies is built through long-term partnerships, especially in research buildings."

Economics

Economics refers to cost recovery, pricing strategies, and financial transparency around shared space usage. Many institutions showed low maturity in this area, with limited or inconsistent cost frameworks.

University E highlighted a relaxed approach: "We generally don't ask for compensation, except when commercial parties are involved." University D has begun implementing internal financial systems: "We apply an internal charging model based on square meters. It helps us make more conscious decisions about space use."

The resulting matrix provides a comparative overview of institutional profiles in terms of their shared space strategies. This prototype matrix highlights variation in approaches and pinpoints key areas where strategic or operational realignment may be needed. A sample version of the matrix is presented in Figure 14.

S.P.A.C.E. Term	Current Use / Insight from Interview
Strategy	From no strategic alignment to fully aligned with the university's long-term goals.
Practicality	From highly impractical or complex to manage to easy and efficient to organize.
Accessibility	From restricted access or difficult to reach to open, easy, and welcoming access for third parties.

	Collaboration	From incidental or transactional use with little partnership to strong, ongoing collaboration with shared interests.
	Economics	From high costs or low financial return to cost-effective and/or financially beneficial for the university.

Figure 14: S.P.A.C.E dimensions (own work)

7.3 Interpretation of the S.P.A.C.E scoring levels

To support comparative analysis between universities, the S.P.A.C.E. matrix uses a 5-point scoring scale across five key dimensions: Strategic Fit, Practicality, Accessibility, Collaboration, and Economics. Figure 15 below explains what each score represents per dimension. These levels were assigned based on triangulation between interview responses, survey data, and researcher interpretation. They serve as relative indicators rather than absolute benchmarks.

Score	Strategic Fit	Practicality	Accessibility	Collaboration	Economics
5 – High	Sharing is fully embedded in long-term institutional and spatial strategy.	Spaces and scheduling systems are centrally managed and support flexible, shared use.	Non-university users have clear, structured access to shared educational spaces.	Partnerships with third parties are frequent, formalized, and aligned with mission.	Financial frameworks include pricing, service costs, and sustainable funding.
4 – Developed	Strategy supports sharing, though implementation varies between faculties.	Some digital or physical systems enable sharing efficiently.	Access is facilitated but not consistent across space types.	Collaboration occurs structurally in some domains (e.g. education, events).	Internal cost-awareness and informal pricing exist for third-party use.
3 – Moderate	Sharing is part of discussions but lacks policy or institutional anchoring.	Some rooms can be shared; others are not due to scheduling or layout.	Access to certain facilities possible but often restricted or informal.	Collaborations are ad hoc or championed by individuals, not organization-wide.	Financial impacts are known but not yet formalized or measured.
2 – Limited	Some staff promote sharing, but there is no shared institutional view.	Technical or logistical issues (e.g. no shared bookings) limit practical use.	Spaces are rarely opened to external users or require complex permission.	External cooperation is occasional and lacks strategic alignment.	Economic impact is not calculated; sharing is done without cost structures.
1 – Low	No strategic orientation toward sharing; focus remains internal.	Legal, logistical, or security barriers block shared use.	Campus is closed to outside users; use is restricted to students/staff.	No collaboration with third parties; inward-focused institution.	No pricing, budgeting, or financial mechanisms related to shared use.

Figure 15: scoring per dimension(own work)

7.4 Contribution of the Matrix to Comparative Understanding

By translating qualitative insights into a matrix format, S.P.A.C.E. enables horizontal comparison between institutions. It highlights how universities differ not only in maturity across dimensions, but also in their strategic intent and practical capacity.

For example, University A displays strong performance across all S.P.A.C.E. dimensions, reflecting its valorization-driven mission. As one respondent from University A noted, "At University A, collaboration with external parties is viewed as an opportunity, not a burden. This is evident across governance and space use." Conversely, University B appears more cautious and inward-looking, facing notable challenges in accessibility and formal partnerships. University D illustrates an intermediate case: "University D is more careful but does occasionally share spaces with secondary education institutions."

The S.P.A.C.E. matrix therefore can function both as a diagnostic tool and a strategic lens. It offers policymakers a clearer view of institutional practices, helping to identify areas where coordination, investment, or cultural change may be required to support more strategic and sustainable space sharing.

7.5 Summary of implementation of the S.P.A.C.E.-sharing matrix

The S.P.A.C.E. matrix helped surface key differences in how universities approach space-sharing. While all institutions acknowledge the societal and financial value of sharing educational spaces, their strategies differ significantly due to governance structures, institutional culture, and mission alignment.

University A demonstrates a high level of strategic alignment and collaboration, actively incorporating third-party partnerships — including educational institutions and businesses — into its core mission. Its centralized control over space, combined with a valorization-driven culture, results in high scores on Collaboration, Economics, and Strategic Fit.

University B follows a more conservative, inward-focused approach. While committed to societal access and regional engagement, it faces internal resistance and fragmented scheduling responsibilities. This leads to lower scores on Collaboration and Practicality, despite strong intentions and a high level of Accessibility.

University C balances a strong community orientation with moderate operational support. It emphasizes accessibility and regional collaboration but lacks the centralized governance needed for full strategic integration. It scores moderately across all dimensions, reflecting both opportunity and constraint.

University D performs well in Strategic Fit and Practicality, due to its efficient use of space and internal charging mechanisms. However, space-sharing is primarily internally oriented and incidental with third parties. Collaboration remains limited due to faculty-based space control.

University E has a clear public value mission, actively sharing spaces with educational partners and local government. However, due to the absence of centralized policy, implementation remains fragmented. Its highest scores are on Collaboration and Accessibility, though Economics is rated low due to a lack of formal pricing or service agreements.

This comparison underscores that no single profile is ideal. Instead, the S.P.A.C.E. framework reveals that universities must align their operational realities with strategic ambitions, and that different institutions require different pathways to effective, equitable space-sharing.

University A

S.P.A.C.E. Term	Current Use / Insight from Interview
Strategy	Fully aligned – valorization is a core mission; sharing supports innovation.
Practicality	Managed – lifecycle-based approach for startups ensures phased space use.
Accessibility	Controlled – access depends on the type of space; some open (Innovation Space), others restricted.
Collaboration	Strong – partnerships with companies and shared use.
Economics	High – shared investments and space use tied to financial strategy.

University B

S.P.A.C.E. Term	Current Use / Insight from Interview
Strategy	Internally focused – emphasis on exclusive use for own students.
Practicality	Very limited – capacity constraints prevent sharing.
Accessibility	Restricted – libraries have access gates for own students only.
Collaboration	Low – minimal engagement with external partners for space sharing.
Economics	Minimal – sharing not pursued as a financial strategy.

University C

| S.P.A.C.E. Term	Current Use / Insight from Interview
Strategy	Partially aligned – supports some collaboration, but core use remains for internal students.
Practicality	Challenging – tight internal scheduling makes large-scale sharing complex.
Accessibility	Open – libraries accessible to external students.
Collaboration	Strong – structural collaboration with HBO and medical faculties.
Economics	Low priority – sharing not driven by revenue generation.

University D

S.P.A.C.E. Term	Current Use / Insight from Interview
Strategy	Conservative – prefers internal optimization before sharing.
Practicality	Complex – organizational and scheduling issues limit sharing feasibility.
Accessibility	Semi-public – libraries are accessible but regulated during peak times.
Collaboration	Moderate – some cases and incidental rentals.
Economics	Secondary – only considered for unused space.

University E

S.P.A.C.E. Term	Current Use / Insight from Interview
Strategy	Open and socially engaged – sharing with regional educational institutions aligns with the university's mission of knowledge exchange and connection with their region.

Practicality	Complex – scheduling is decentralized, limiting central control; steps are being taken toward centralization.
Accessibility	Semi-open – library and lecture halls are occasionally shared with Hanze University of Applied Sciences and the municipality; typically, without financial compensation.
Collaboration	Strong – structural cooperation with University of Applied sciences (e.g., for exam halls); informal engagement with local authorities for events.
Economics	Low – spaces are mostly shared free of charge; reevaluation underway due to rising operational costs.
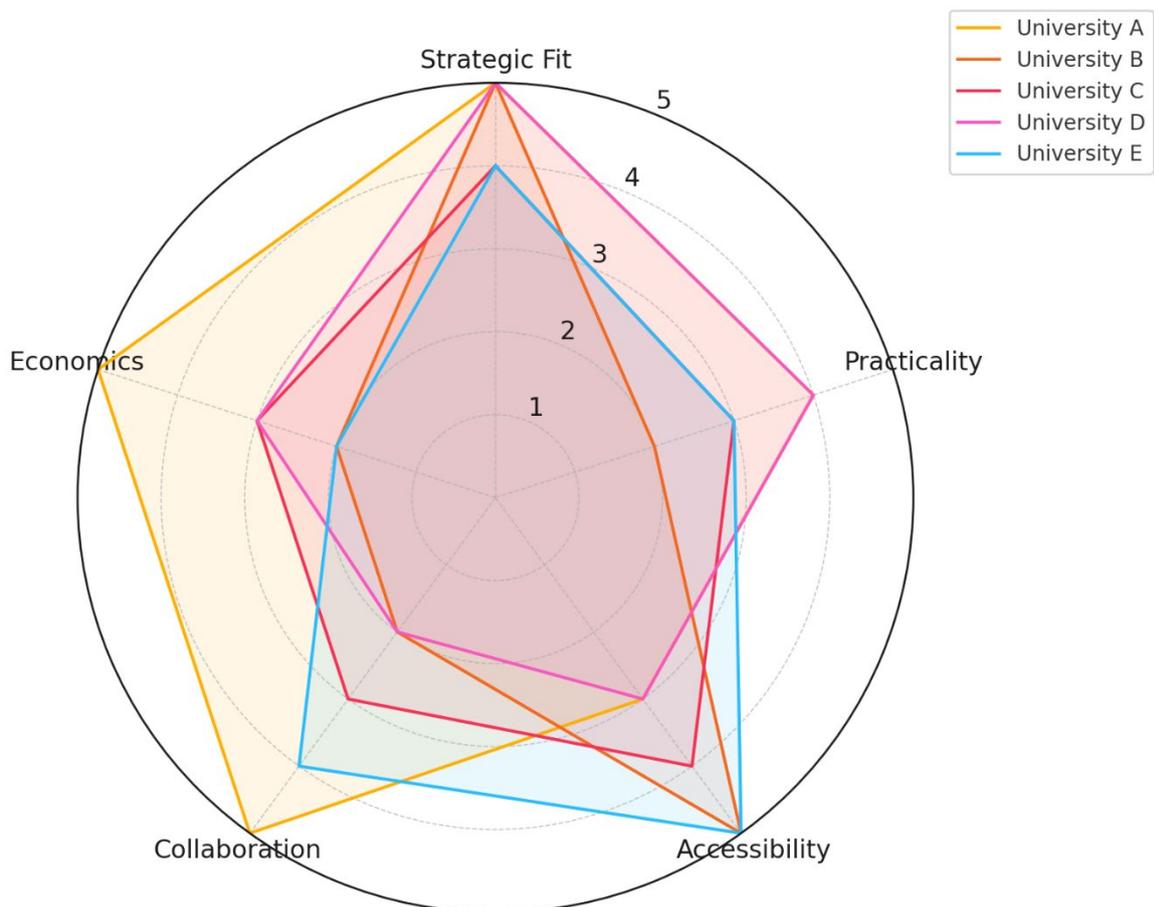
7.6 Limitations

While the S.P.A.C.E. matrix offers a helpful tool to compare space-sharing opportunities, it does come with some limitations. First, the matrix is based on the input of only five universities. This means the results cannot be seen as representative for all Dutch universities, let alone for universities in other countries. The findings give a first impression but may look very different if more universities or different types of institutions had been included. Another limitation is that the matrix only looks at educational spaces, such as lecture halls and study areas. Other important spaces like research labs, offices, or sports facilities were left out of scope, which means the matrix does not give a complete picture of the sharing potential of the whole campus.

In addition, the scoring in the matrix is partly based on interpretation. What one university sees as highly strategic or easy to share, might be seen differently by another, depending on their own situation and goals. This makes it harder to compare results across universities in an objective way. It is also important to note that the findings reflect the current situation at the time of the research. As universities develop their strategies or face new challenges, these scores and interpretations may change over time.

The matrix has been developed from the perspective of university staff and managers, and does not directly include the voices of students, teachers, or the external parties that use the spaces. Their experiences and needs could add an important extra layer that is not yet covered in this version of the matrix. Still, despite these limitations, the matrix provides a useful starting point to reflect on how universities can make better use of their educational spaces and build stronger collaborations with external partners.

8. Recommendations: Applying the S.P.A.C.E. Matrix

This chapter offers recommendations on how universities and policymakers can use the S.P.A.C.E. matrix as a practical framework to understand and enhance shared space use. Rather than prescribing detailed policy actions, this section focuses on the matrix's potential as a diagnostic, communicative, and strategic tool. It also reflects on its applicability beyond the academic context.

8.1 Using the S.P.A.C.E. Matrix Within Universities

The S.P.A.C.E. matrix provides a clear structure for evaluating the status of space sharing across five essential dimensions: Strategy, Practicality, Accessibility, Collaboration, and Economics. Each university in this study has been mapped according to these criteria using qualitative interview data. This enables institutions to:

- **Identify strengths and bottlenecks.** For example, University A shows strong alignment on Strategy and Collaboration, while University B and D highlight practical and cultural barriers.

- **Facilitate internal dialogue.** The matrix can serve as a conversation starter between facility managers, schedulers, academic departments, and executive boards.

- **Monitor changes over time.** Repeated assessments using the matrix can reveal progress or stagnation in policy implementation.

When embedded in broader campus planning, the matrix helps link operational practices to strategic goals. For instance:

- **Linking collaboration initiatives with spatial policy.** Universities seeking regional engagement can use the matrix to ensure physical space policies reflect those ambitions.

- **Making implicit practices explicit.** Many interviews revealed informal or ad hoc arrangements. The matrix brings structure to this reality.

8.2 Broader Applications Beyond the University Sector

Although developed in the context of higher education, the S.P.A.C.E. matrix may be valuable for other sectors that manage shared facilities. For example:

Public libraries and cultural institutions could apply the matrix to evaluate the balance between internal programming and public access. These institutions often face tensions between openness and functional control, particularly during peak periods or specialized use.

Municipal governments managing school-community partnerships or multifunctional buildings may also benefit. Similar governance and scheduling challenges arise when coordinating access across diverse user groups. The matrix can help identify where strategic intentions diverge from operational constraints.

Commercial organizations organizing their portfolio to maximize the use of their product can also be mentioned as a sector that can use this matrix. By implementing sharing within their real estate management, it can help with the efficiency and be an extra source of income.

The matrix is adaptable to different institutional logics: what constitutes "accessibility" or "collaboration" can be redefined per context. While originally rooted in higher education, its structure, and underlying principles; visibility, governance, and cost awareness; make it suitable for guiding shared space development in public, civic, and commercial settings.

8.3 Stakeholder Use of the S.P.A.C.E.-sharing Matrix

The S.P.A.C.E. matrix serves as both a diagnostic and alignment tool for diverse university stakeholders. Each group plays a specific role in shaping educational space use, from daily operations to long-term strategy. By offering a shared language, the matrix bridges institutional silos and supports tailored decision-making.

Campus and Real Estate Managers

Can use the matrix to benchmark internal performance, identify operational bottlenecks (e.g., decentralized scheduling), and initiate policy alignment across faculties. The tool supports dialogue between tactical and strategic levels of space governance.

Executive Boards and Strategy Units

Apply the matrix outcomes to align space-sharing with broader institutional goals such as valorization, social inclusion, or regional collaboration. It also helps justify long-term investments in shared infrastructure or scheduling reform.

Facility and Planning Teams

Use the scores as input for room booking policies, spatial configuration, or long-term capacity planning. The matrix helps visualize tensions between local flexibility and collective space optimization.

Central Campus Teams

Facilitate strategic-operational alignment by translating university-wide ambitions into faculty-level practices. These teams can use the matrix to initiate institutional dialogue and surface blind spots.

Faculty Departments

Evaluate the feasibility and desirability of shared space use at the program or departmental level. The matrix encourages constructive discussion rather than defensiveness.

External Stakeholders (e.g. Campus NL)

As a coordinating body, Campus NL can use the tool to promote shared learning between universities, host benchmark sessions, and support policy harmonization across the sector.
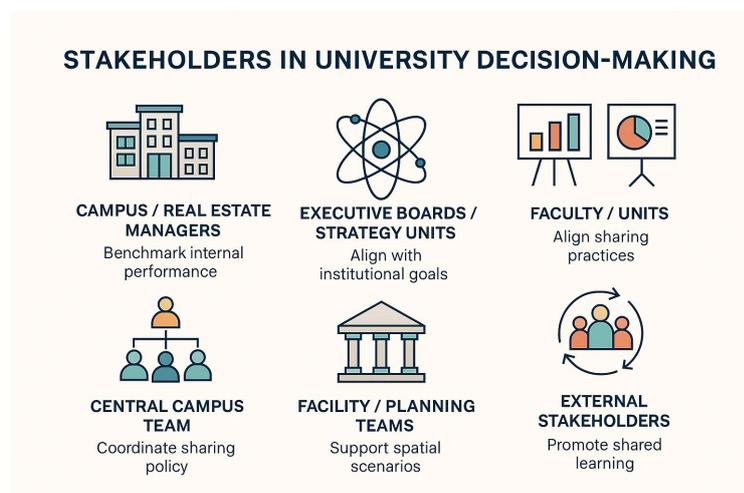

Figure 16: Possible stakeholders(own work)

Application Modes:

- As a **self-assessment tool**: internal teams score their university to initiate dialogue and discover blind spots.

- As a **cross-institutional benchmark**: multiple universities score themselves for comparative insight, fostering mutual learning.

- As a **strategic trigger**: used during masterplan updates, new collaborations, or audits to prompt discussion about third-party use.

In all cases, the matrix should be accompanied by qualitative discussion. It does not aim to reduce complex governance and cultural dynamics to nUMbers but to provide a **shared vocabulary** and **structure** to enable meaningful, evidence-informed decisions about the future of educational space.

8.4 Conclusion

The S.P.A.C.E. matrix is a flexible and insightful tool for capturing the complexities of space sharing. Its power lies in simplification without losing nuance. Universities can use it to steer conversation, align internal perspectives, and evaluate development. With minimal adjustment, the matrix also holds promise for broader applications in public and private sectors concerned with multi-user space management.

Part VI – Conclusion and Recommendations

This final part reflects on the outcomes of the research. It synthesizes the main insights from both the theoretical and empirical work, offering answers to the research question and sub-questions. The discussion includes practical recommendations for universities, considerations for policymakers, and suggestions for future research. It also reflects on the limitations of the study and the relevance of space-sharing in shaping resilient and collaborative educational environments.

9. Conclusion

9.1 Summary of Key Findings

This thesis investigated the current drivers, barriers, and strategies that shape how Dutch universities share their educational spaces with third parties. The study combined literature review, stakeholder surveys, and in-depth interviews with five universities, and introduced the S.P.A.C.E. matrix to support comparative analysis.

The findings confirm that many universities are open to sharing their spaces, motivated by societal relevance, efficiency goals, and the desire to strengthen regional and academic ecosystems. However, actual implementation is often limited, fragmented, and reactive rather than proactive.

Five key conclusions:

1. **Drivers are strong but not yet strategically embedded.**
   Motivations such as cost-efficiency, public value creation, and cross-sector collaboration are frequently mentioned but remain loosely connected to institutional strategy.

2. **Barriers are persistent and systemic.**
   Decentralized governance, cultural resistance from academic staff, inflexible scheduling systems, and lack of clarity in legal and financial arrangements significantly limit progress.

3. **Types of spaces and users vary in complexity.**
   Spaces like libraries and lecture halls are more frequently shared due to their flexibility, while examination rooms and laboratories face higher thresholds due to security, equipment, and ownership issues. Similarly, some third parties (e.g., public educational partners) are easier to combine than others (e.g., private firms).

4. **Governance and coordination are critical success factors.**
   Universities with clearer decision-making structures and designated teams for space-sharing (e.g., Campus & Community teams) are better equipped to develop consistent policies and partnerships.

5. **The S.P.A.C.E. matrix enables informed comparison.**
   This framework provides a structured way to assess readiness and alignment across five dimensions, Strategic Fit, Practicality, Accessibility, Collaboration, and Economics, highlighting opportunities and gaps in current practices.

9.2 Answer to the Main Research Question

The central research question was:

What are the current drivers, barriers, and strategies for universities in adjusting their portfolio of shared educational spaces with third parties?

The answer is that while Dutch universities recognize the strategic and societal value of shared spaces, they are not yet structurally equipped to implement this vision. Drivers are well understood, but barriers in governance, culture, and operations prevent systemic application. Current strategies are mostly exploratory, with isolated examples of success but no sector-wide alignment or structure.

There is a clear opportunity for universities to shift from ad-hoc experiments to coordinated strategies, supported by shared tools, national platforms, and stronger internal governance.

9.3 Reflections on Implications

The findings of this thesis carry several implications for university leadership, campus strategists, and policymakers:

- **Universities must treat shared educational spaces as strategic infrastructure**, not as a side activity. This requires integration into long-term portfolio planning, educational policy, and regional engagement strategies.

- **Governance must be strengthened.** Without clear ownership, shared use of space will remain fragmented. Central coordination units and decision-support tools like the S.P.A.C.E. matrix can play a vital role.

- **National alignment is needed.** The absence of benchmarking and collective learning slows down progress across the sector. Campus NL is well-positioned to support a shared agenda for knowledge exchange, peer review, and sector-wide strategy.

- **Culture matters.** Shifting perceptions within universities, especially among academic staff, is crucial. Sharing should not be seen as a threat to quality or autonomy but as an opportunity to open the university and reinforce its societal mission.

In summary, the potential of shared educational spaces is clear. The challenge now lies in turning this potential into structured, supported, and future-proof practice.

9.4 Looking Ahead

This research has shown that the university campus is evolving from a closed environment for teaching and research into a more open, adaptive, and networked ecosystem. Educational spaces should reflect this shift: they must be accessible, flexible, and able to serve multiple users without compromising core academic quality.

The S.P.A.C.E. matrix provides a tool for universities to assess and guide this transformation. It is not a final answer, but a step toward more consistent, data-driven, and mission-aligned decision-making about how, and with whom, space can be shared.

As Dutch universities face spatial, financial, and societal pressures, the case for sharing becomes not only attractive but necessary. Those who act now, by building institutional capacity, learning from peers, and investing in cultural and operational readiness, will be better prepared to navigate this transition and to shape the university of the future.

A university is not just a place for students. It is a space that belongs to the society around it.

10.   Recommendations

While this thesis provides useful insights into the drivers, barriers, and strategies of sharing educational spaces with third parties, it also raises new questions that couldn't be fully answered within the scope of this research. There are still areas that deserve further exploration to improve the understanding of space-sharing and to strengthen the tools and frameworks developed so far. Below are several suggestions for follow-up research.

First, the S.P.A.C.E. matrix that was developed in this thesis could be further tested and improved by applying it to a larger and more diverse group of universities. This study was based on just five cases, so future research could include more universities and possibly other types of institutions to see if the matrix holds up in different contexts. Using surveys with a more standardized scoring method might also help to make the results more comparable. In addition, looking at universities in other countries could show how the matrix could be adapted to different educational systems.

Another area that deserves more attention is the long-term impact of shared spaces. This research looked at the current situation, but it would be valuable to follow universities over a longer period to see how their space-sharing practices develop over time. This could provide insights into how these initiatives perform in the long University C, both in terms of space use and collaboration.

This research mainly focused on the perspectives of university staff and management, but it is just as important to understand how students, teachers, and other users experience shared spaces. Future research could dive deeper into their needs, expectations, and experiences to make sure that space-sharing works well for the people using these spaces daily.

Another important topic is the legal and policy side of space-sharing. Universities often face restrictions when it comes to public funding rules or leasing out their spaces to third parties. More research could help clarify what is legally allowed and where there might be opportunities to improve the rules to better support collaboration.

The financial side of space-sharing also deserves more attention. Future research could look at the costs and benefits in more detail, for example by developing models to calculate the financial impact of shared use. This could help universities make better decisions and build a stronger business case for sharing their spaces.

Finally, with the rise of digital and hybrid learning, it would be interesting to explore how online platforms, and virtual spaces influence the need for physical spaces. This could open new possibilities for sharing spaces in a completely different way.

In short, this thesis has opened the door to a wider research agenda. By expanding the scope, including the voices of users, and improving tools like the S.P.A.C.E. matrix, future research can help universities make more strategic, inclusive, and flexible choices when it comes to sharing their educational spaces.

11.   Reflection

11.1   Reflection on the research

Looking back on this research, it has been both a challenging and rewarding journey. The topic of sharing educational spaces with third parties turned out to be more complex than it seemed at first. What started as a relatively practical question, how universities can share their spaces more effectively, quickly revealed deeper issues related to governance, culture, economics, and policy.

One of the biggest learning points was realizing that there is no single way universities define or approach space-sharing. This became clear early on during the Mentimeter session, which showed just how differently universities interpret the idea of sharing, who they share with, and how often they do it. These differences shaped the rest of the research and made the interviews even more interesting.

Talking to people from five different universities showed that space-sharing is rarely just a logistical or financial decision. It is often influenced by cultural resistance, unclear policies, or a lack of internal coordination. While most universities seem to recognize the benefits of sharing, especially in terms of societal value and collaboration, they also face real barriers when it comes to putting these ideas into practice.

Developing the S.P.A.C.E. matrix helped to structure these insights and compare different perspectives. At the same time, I realize that the matrix is still in an early stage and would need further testing on a larger scale to really prove its value. It is based on the views of a limited number of universities and focuses only on educational spaces, while there are many other types of spaces that could be just as relevant to study in the future.

I also learned that the student and staff experience of shared spaces is still missing in this research. While the focus on institutional perspectives was useful to understand policy and strategy, the voices of daily users are just as important to make sharing successful in practice. This is something that should be explored further.

11.2   Personal reflections

This research started with my ambitions of adding something to the world of the new students going to the university. Shaping the first bonds in sharing happened in the course Real Estate Management where it became clear that sharing and collaboration between universities was high on the agenda of the TU Delft, Leiden, and Rotterdam. The combination of these two drives came together in this research. The challenge for me was to find the motivation for students when only looking at the perspective of the university. The main reason as well for this report to focus on education spaces is the first limitation so I can implement that part of doing it for the students. The stage of the social perspective that is closed in the last part of the literature review came hand in hand by discussing the ambition with my mentors, leading to an addition to my conceptual model. It made me review my work and look for the line between the know work and the lessons of social impact on new generations as a university.

A lot was learned during this research. Understanding how universities comprehend the needs of their own students and that of the community is something I was already fascinated with, but now I know that there is much more to it than only doing good or for them to focus on their duty towards their students and staff. To be of help to everyone when there is demand and opportunity. It started as a place for me to step into a new life beyond studying, but it developed the interest in me to also make it part of that new life and give more meaning to sharing from out universities and doing good.

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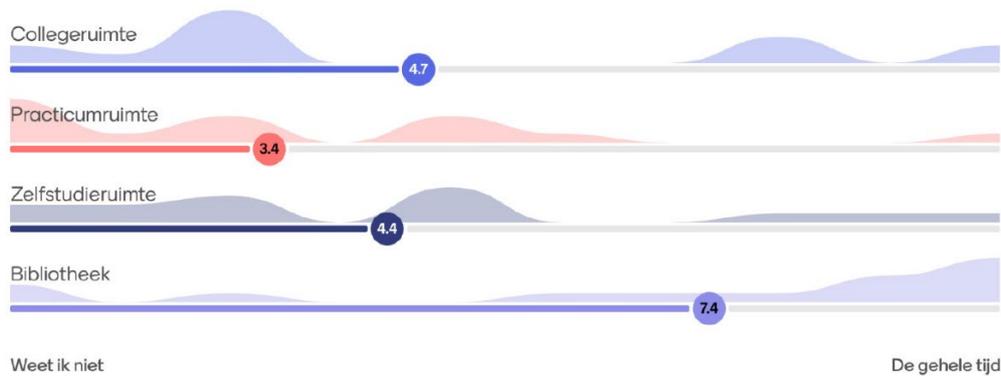
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Appendix I: Interview overview table

All interview data in this report has been anonymized in accordance with TU Delft ethical guidelines. Institutional and individual identifiers have been removed or replaced with generic references to protect confidentiality.

Ref.	Type	Date	Institution (Alias)	Function Description	Responsibility Level	Notes
M1	Mentimeter	Mar 2025	National Platform	Program coordinator	Strategic	National knowledge exchange
I1	Interview	Mar 2025	University D	Senior facility officer	Tactical	Focus on external collaboration
I2	Interview	Apr 2025	University B	Campus planner	Operational	Conservative space use
I3	Interview	Apr 2025	University E	Real estate strategist	Strategic	Aligns use with regional mission
I4	Interview	Apr 2025	University A	Education space coordinator	Operational	Shares space with regional college
I5	Interview	Apr 2025	University C	Head of facility planning	Tactical	Discusses need for central control

Appendix II: Results mentimeter

Collegeruimte 4.7

Practicumruimte 3.4

Zelfstudieruimte 4.4

Bibliotheek 7.4

Weet ik niet   De gehele tijd

Hoe vaak wordt er gedeeld? Kies voor meest representatief delen   ⌂ 14
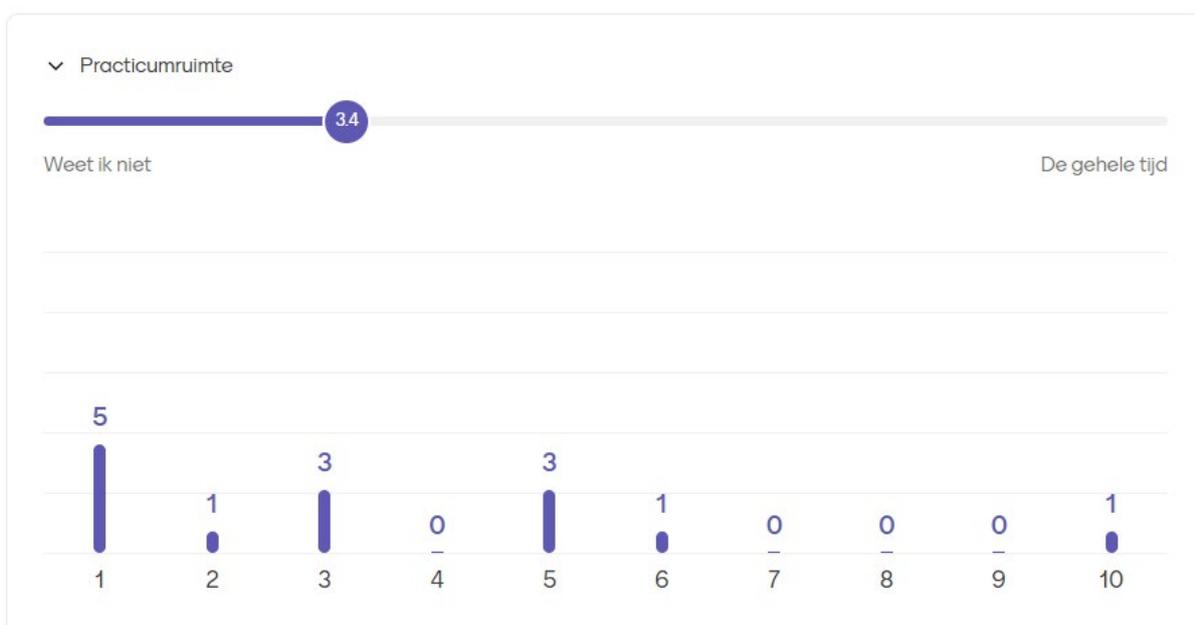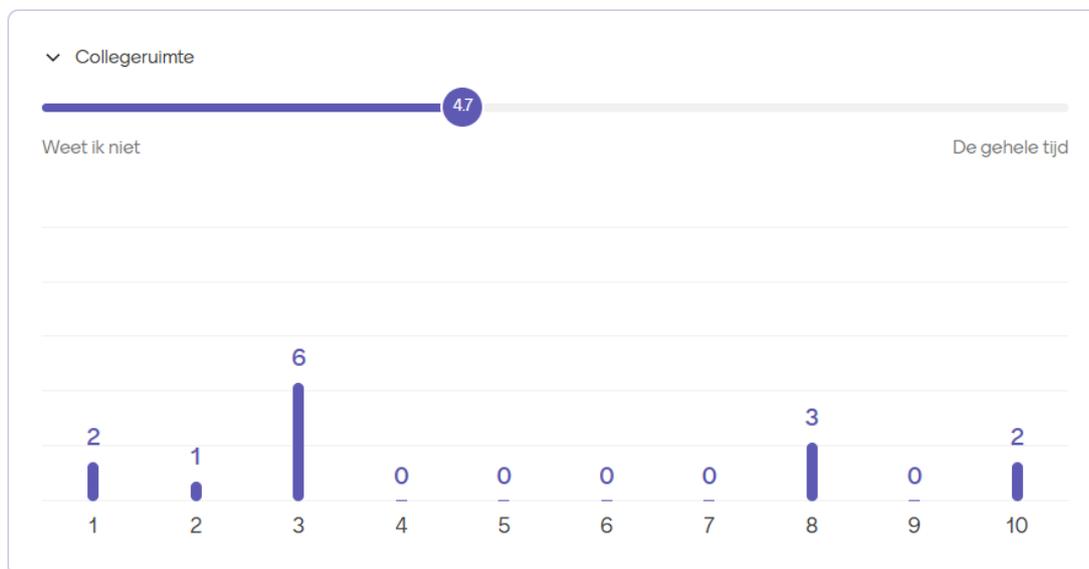
Collegeruimte 4.7

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2	1	6	0	0	0	0	3	0	2

Practicumruimte 3.4

Weet ik niet   De gehele tijd

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5	1	3	0	3	1	0	0	0	1

Zelfstudieruimte

4.4

Weet ik niet — De gehele tijd

1	2	3	4	5	6	7	8	9	10
2	2	3	0	4	0	0	1	1	1

Bibliotheek

7.4

Weet ik niet — De gehele tijd

1	2	3	4	5	6	7	8	9	10
2	0	1	0	0	1	1	1	3	5

69

Andere onderwijs instituten

5.9

Andere onderzoeksorganisaties

4.2

Overheidspartijen

2.9

Private partijen

3.4

Internationale organisaties

2.2
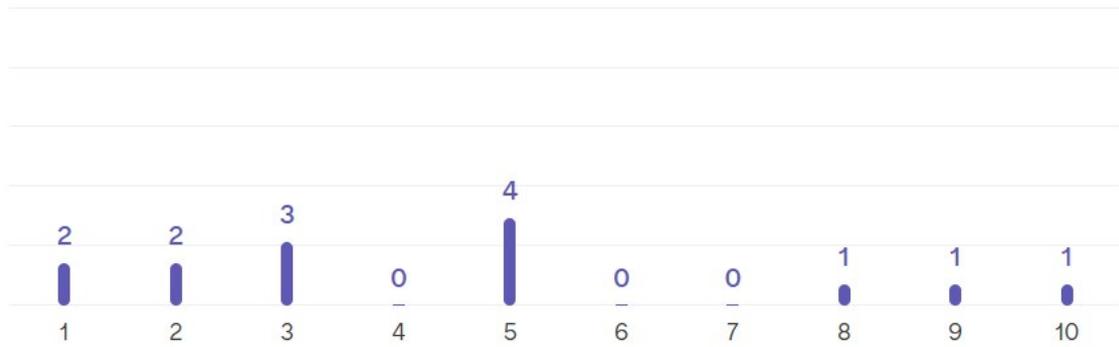
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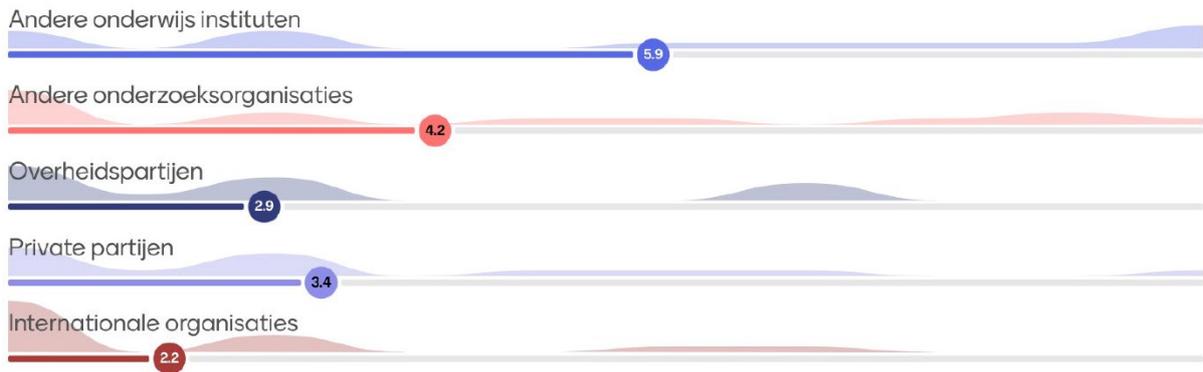
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👤 14

⌄ Andere onderwijs instituten

5.9

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1	2	3	4	5	6	7	8	9	10

⌄ Andere onderzoeksorganisaties

4.2

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6	0	2	0	1	1	0	1	2	1
1	2	3	4	5	6	7	8	9	10

Overheidspartijen

Weet ik niet 2.9 De gehele tijd

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6	1	4	0	0	0	3	0	0	0

Private partijen

Weet ik niet 3.4 De gehele tijd

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Internationale organisaties

Weet ik niet 2.2 De gehele tijd

1	2	3	4	5	6	7	8	9	10
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71

Financieel
2.6

Gebruik
4.8

Veiligheid
4.8

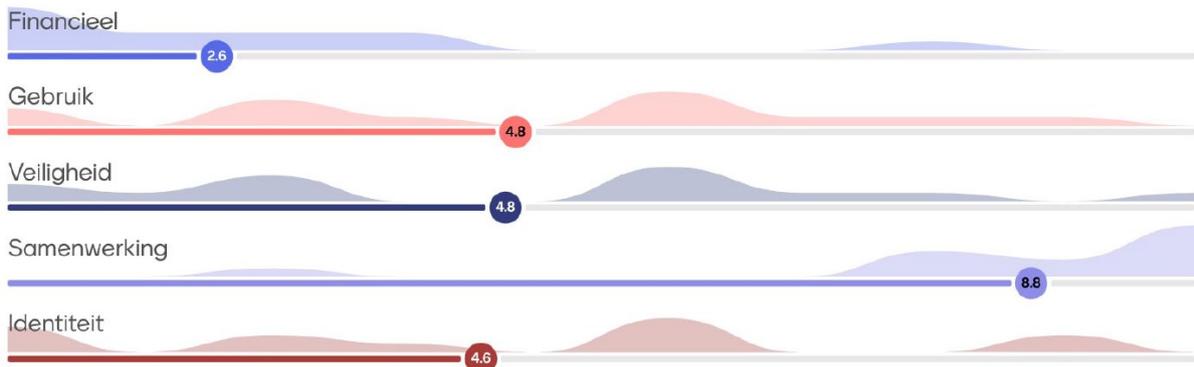Samenwerking
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Identiteit
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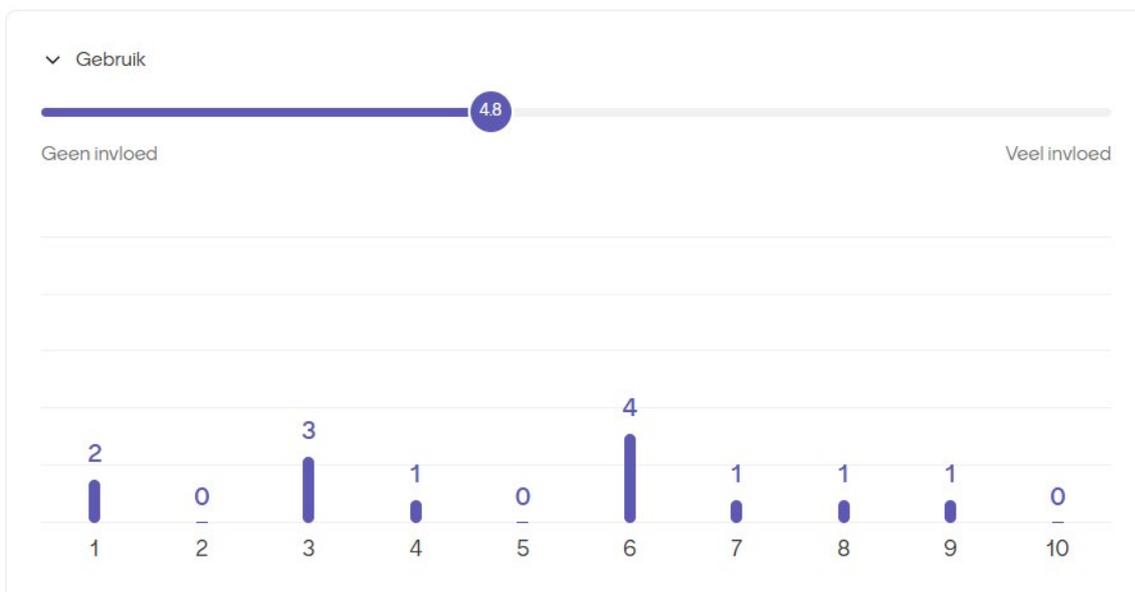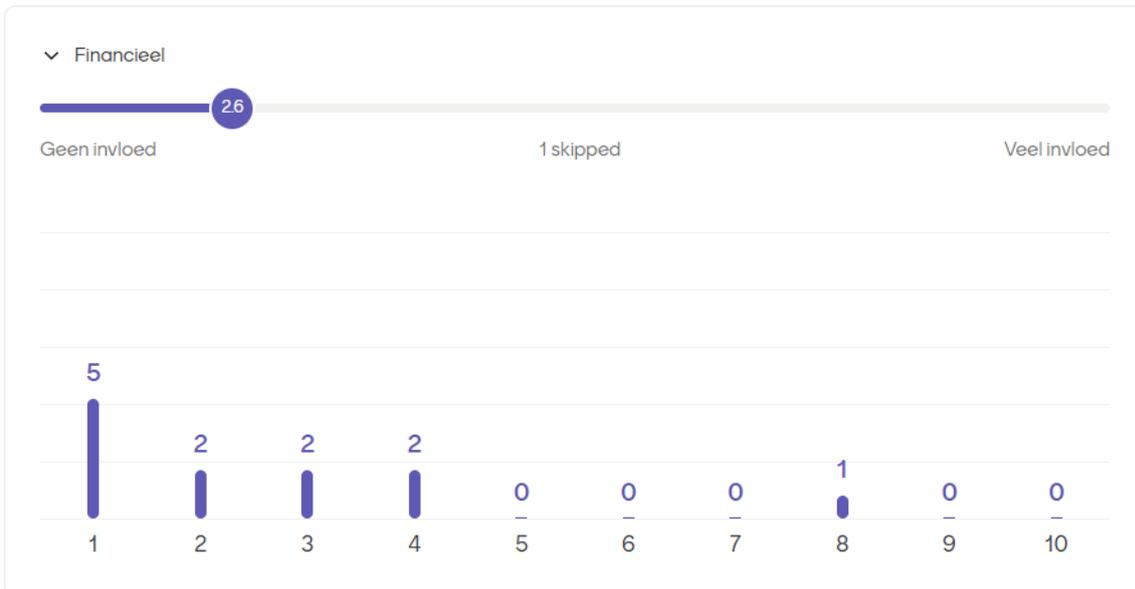Geen invloed   Veel invloed

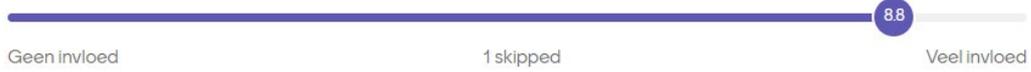Factoren om te delen of niet. Kies voor meest representatief delen.   👤 13

Financieel

2.6

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Gebruik

4.8

Geen invloed   Veel invloed

1	2	3	4	5	6	7	8	9	10
2	0	3	1	0	4	1	1	1	0

Veiligheid

4.8

Geen invloed   Veel invloed

	2	1	3	0	0	4	1	1	0	1
	1	2	3	4	5	6	7	8	9	10

Samenwerking

8.8

Geen invloed   1 skipped   Veel invloed

	0	0	1	0	0	0	0	3	2	6
	1	2	3	4	5	6	7	8	9	10

Identiteit

4.6

Geen invloed   1 skipped   Veel invloed

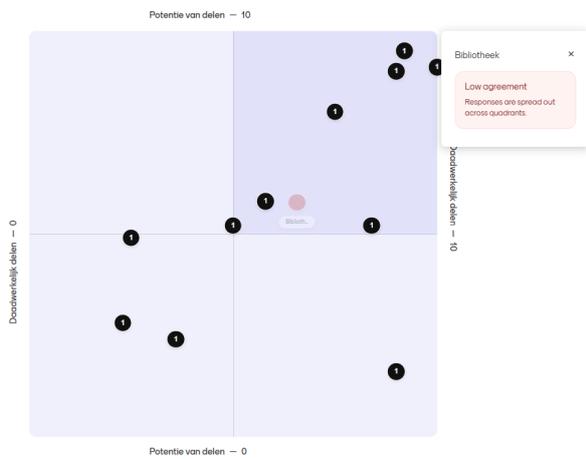|	3	0	2	1	0	4	0	0	2	0
	1	2	3	4	5	6	7	8	9	10
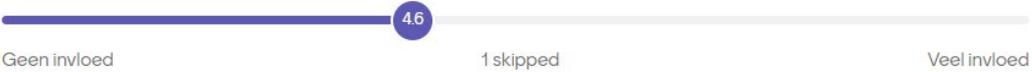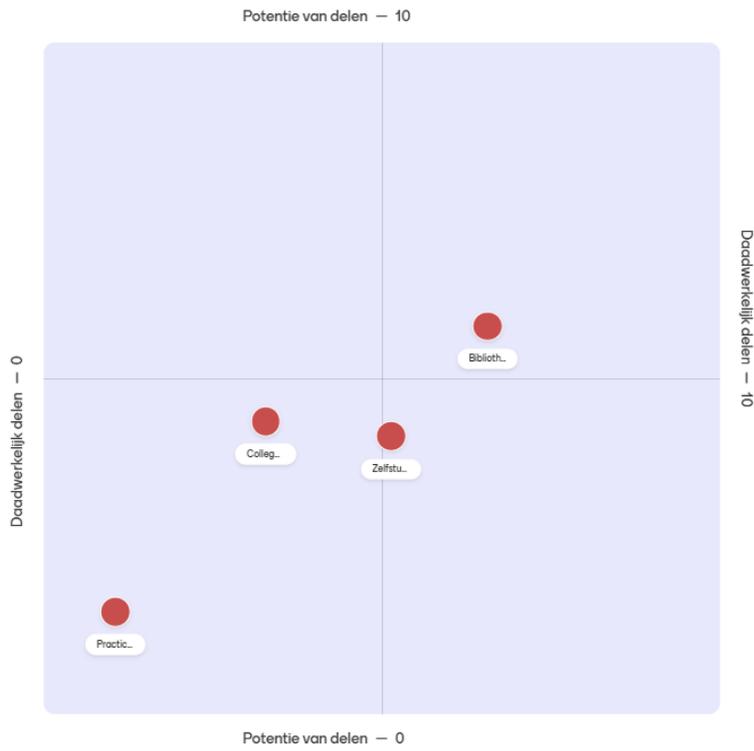
Potentie van delen vs. daadwerkelijk delen (1 tot 10)

Potentie van delen vs. daadwerkelijk delen (1 tot 10)

Bibliotheek

Low agreement
Responses are spread out across quadrants.

Potentie van delen vs. daadwerkelijk delen (1 tot 10)

Zelfstudieruimte

Low agreement
Responses are spread out across quadrants.

Potentie van delen vs. daadwerkelijk delen (1 tot 10)

Collegeruimte

Low agreement
Responses are spread out across quadrants.

Potentie van delen vs. daadwerkelijk delen (1 tot 10)

Practicumruimte

Low agreement
Responses are spread out across quadrants.
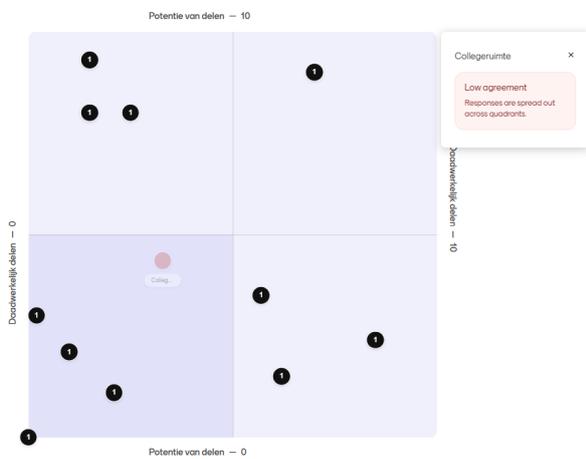
Appendix III: Interview Protocol on Universities on Sharing Educational Spaces with Third Parties

Zoals eerder aangegeven doe ik momenteel onderzoek naar het delen van onderwijsruimtes met externe partijen aan universiteiten. In dit onderzoek kijk ik naar hoe universiteiten omgaan met het openstellen van hun onderwijsfaciliteiten voor bijvoorbeeld bedrijven, maatschappelijke organisaties of overheidsinstanties. Daarbij richt ik me onder andere op beleid, samenwerking, uitdagingen en kansen.

Tijdens de DFB-HOI bijeenkomst 2025 werd benoemd dat u vanuit het campusteam de juiste persoon bent om hierover te spreken, en ik waardeer het zeer dat u bereid bent om uw kennis en ervaringen te delen.

Hieronder vindt u ter voorbereiding een korte toelichting op het interview en een overzicht van de onderwerpen en vragen die ik zal stellen. Het interview zal ongeveer 45 minuten duren. Uiteraard worden uw antwoorden vertrouwelijk behandeld, en ik vraag vooraf uw toestemming voor het eventueel opnemen van het gesprek (alleen voor uitwerking).

Doel van het interview

Het interview is onderdeel van een breder onderzoek naar het delen van onderwijsruimtes met derden, en heeft als doel inzicht te krijgen in:

- De huidige praktijk en betrokken partijen,

- Organisatorische en beleidsmatige kaders,

- Kansen en knelpunten,

- En de toekomstvisie rondom dit thema.

Interviewvragen – Overzicht per thema

1. Achtergrondinformatie (ca. 5 min)

- Kunt u kort uw rol en verantwoordelijkheden binnen de universiteit toelichten?

- Hoe lang bent u betrokken bij het beheer of coördinatie van onderwijsruimtes?

- Welke rol speelt uw team of afdeling in besluiten rondom het delen van deze ruimtes?

2. Huidige praktijk van ruimtegebruik met derden (ca. 10 min)

- Met welke externe partijen worden onderwijsruimtes momenteel gedeeld?

- Welke soorten ruimtes zijn dit? (Bijv. collegezalen, labs, bibliotheken)

- Hoe vaak worden deze ruimtes gedeeld (incidenteel, regelmatig, structureel)?

- Welke criteria worden gehanteerd om te bepalen wie van de ruimtes gebruik mag maken?

3. Drijfveren en belemmeringen (ca. 15 min)

- Wat zijn de belangrijkste redenen voor het delen van onderwijsruimtes met derden?

- Tegen welke uitdagingen loopt u aan (bijv. veiligheid, capaciteit, culturele verschillen)?

- Hoe beïnvloeden financiële, organisatorische of juridische aspecten deze keuzes?

- Wat is de houding binnen de universiteit (organisatiecultuur) ten opzichte van ruimtegebruik door externe partijen?

4. Publiek-private samenwerking en beleid (ca. 5 min)

- In hoeverre werkt u samen met publieke of private partijen bij het delen van ruimtes?

- Zijn er beleidslijnen of richtlijnen vanuit de universiteit voor deze samenwerking?

- Hoe wordt de balans bewaakt tussen interne onderwijsdoelen en extern gebruik?

- Welke rol speelt maatschappelijk of commercieel belang in deze afwegingen?

5. Beheer en organisatie (ca. 10 min)

- Hoe verloopt de afstemming en het beheer van gedeelde ruimtes?

- Zijn er afspraken of protocollen opgesteld voor gedeeld gebruik?

- Hoe wordt omgegaan met eventuele conflicten of praktische problemen?

- Worden er technologische systemen (bijv. reserveringstools) gebruikt?

6. Toekomstvisie (ca. 5 min)

- Welke kansen ziet u voor toekomstig ruimtegebruik door externe partijen?

- Wat zou helpen om deze vorm van samenwerking te verbeteren of uit te breiden?

- Verwacht u nieuwe vormen van samenwerking in de komende jaren?