

Designing

For

Literacy

MASTER GRADUATION THESIS

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Photograph frontpage:

*The garden library for refugees and migrant workers in Tel Aviv
designed by Yoav Meiri Architects. Photograph made by Y. Meiri
retrieved from Archdaily on 31st of October 2024.*

Designing for Literacy

Architecture as a tool for literacy in Rotterdam South

[Keywords: Low literacy, digital skills, Rotterdam South, development, basic skills, literacy, social inclusion, wicked-problem]

A pivotal moment sparking my fascination with this research occurred on Sunday, September 8, 2024, while watching the NOS news. It was announced that, starting that day “*The news in easy language*” would be broadcast daily, especially aimed at the 2.5 million adults in the Netherlands who have difficulty with the Dutch language. This news made me realize the extent of low literacy in our country, a challenge affecting 1 in 5 residents in my city of Rotterdam alone. It struck me that I likely encounter people facing this struggle daily without being aware of it. This insight opened my eyes to the importance of making information, services, and environments more accessible to everyone, regardless of language or literacy skills.

My own experience with dyslexia has given me a personal perspective on challenges with language. Throughout my life, dyslexia has affected my self-confidence, especially in academic settings where strong reading and writing skills in both Dutch and English are emphasized. Because of this struggle, I often feel insecure compared to my fellow students. Although dyslexia and low literacy differ, I believe my experience has deepened my empathy for those struggling with reading and writing difficulties.

As an aspiring architect, I am driven by a personal goal to help create a more inclusive and equitable society. Realizing that architecture, my passion, can play an important role in bridging this gap has only strengthened my dedication to this mission. By designing inclusive spaces, I hope to contribute to a world where everyone can navigate, access, and fully benefit from the environments around them.

I wish you an inspiring read.

Siti Brandts

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*“**Literacy** is a core component of the right to education as recognised by the Universal Declaration of Human Rights. The right to literacy supports the pursuit of other **human rights**.”*

(UNUESCO, 2013, p.17)

The Landscape of Low Literacy in Rotterdam

In Rotterdam, as much as 21% of the adult population (16 to 65 years) struggles with reading and writing on a sufficient level, representing one in five residents with low literacy that limits their full participation in society (Gemeente Rotterdam, n.d.-a, 2016). Low literacy affects not only individual lives but also broader society, as people with limited literacy skills often face additional challenges such as increased risk of poverty, social isolation, and health problems (Kleffens & Smit, 2016; Pointer, 2023; Stichting Lezen & Schrijven, 2018). They are also more vulnerable to the effects of migration, climate change, and economic instability (UNESCO Institute for Lifelong Learning, 2013), all contributing to a lower quality of life.

Within Rotterdam, the prevalence of low literacy varies considerably by neighborhood, with especially high rates in socioeconomically disadvantaged areas such as Rotterdam South (Dulk et al., 2023; Gemeente Rotterdam, 2016). In the Feijenoord district, for example, as many as 36% of adults are low-literate (Gemeente Rotterdam, 2016). This disparity underscores the urgent need for targeted interventions in such neighborhoods to equip residents with the skills needed for an active and engaged life.

“...1 in 5 low-literate people live below the poverty line for at least 1 year.” – Gemeente Rotterdam (n.d.)

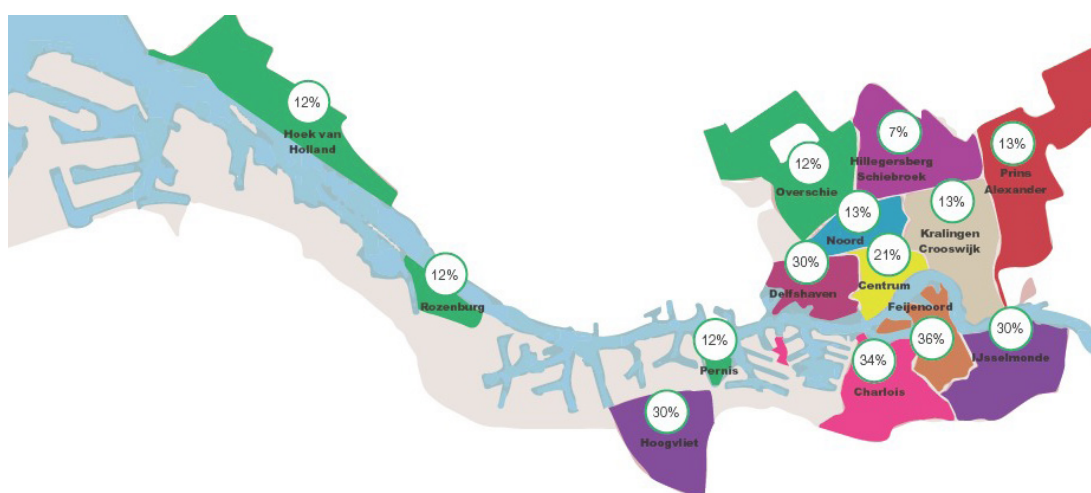


Figure 1
Percentage of low literacy per area in Rotterdam (Gemeente Rotterdam, 2016)

Although Rotterdam leads the statistics, low literacy is a major problem throughout the Netherlands. Nationwide, 12% of adults, about 2.5 million people, are low-literate, 65% of whom are native speakers of Dutch (Gemeente Rotterdam, 2016; Kleffens & Smit, 2016; Pointer, 2023; Stichting Lezen & Schrijven, 2018).

“Low literacy in the Netherlands is on the rise and is a multifaceted problem.”
(Van Klei en Smit, 2016)

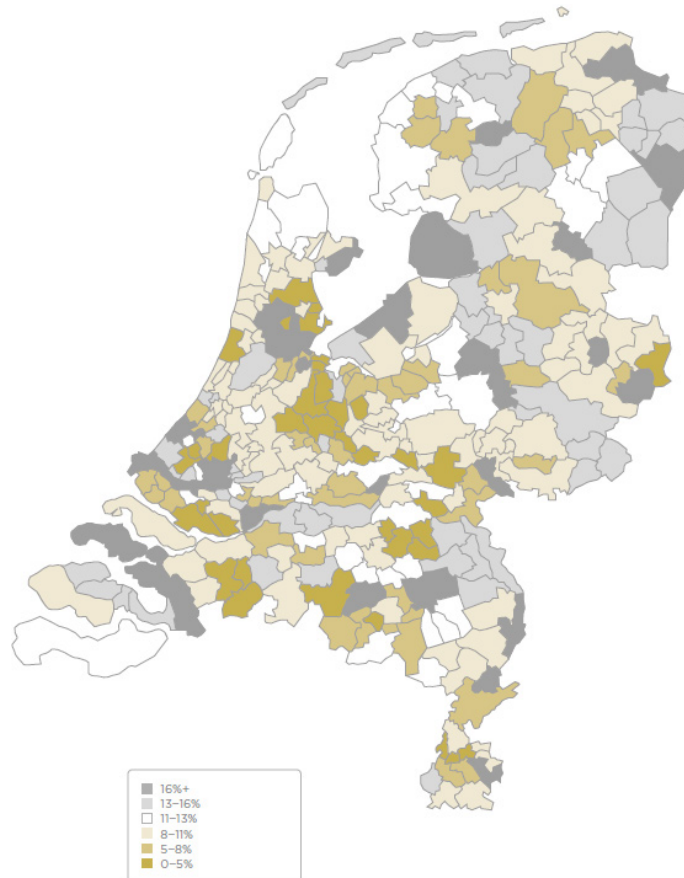


Figure 2
Percentage of low literacy by municipality (ROA, 2016)

This raises the question why a developed and prosperous country such as the Netherlands still faces a significant low literacy problem. The rise in low literacy can be attributed to three main factors. First, we are dealing with an aging population; as people age, their cognitive ability decreases and with it their language skills, making especially those with already limited language skills more vulnerable to low literacy. The second cause is that the language skills of Dutch youth are drastically declining. Research shows that only 31% of students enjoy reading and 17.9% (15 years old) are at increased risk of becoming low-literate (Kleffens & Smit, 2016; Pointer, 2023; Stichting Lezen & Schrijven, 2018). The third cause is migration: a growing number of people are coming to the Netherlands with limited reading and writing skills in their own language (Pointer, 2023). To combat low literacy, the Dutch government has set up the “Tel mee met Taal” action program. Through this, funding is provided to municipalities and employers can apply for subsidies for language and literacy programs. Together with organizations such as the Reading and Writing Foundation, libraries and volunteers, training is offered to help people improve their language and digital skills (Ministerie van Onderwijs, 2013).

“The social costs of low literacy in the Netherlands are approximately €1.13 billion per year” – Stichting Lezen & Schrijven (2018)

“Poor literacy skills are probably affecting more people in Europe than governments are aware of. Most European countries have simply assumed that everyone who passes through compulsory education will be equipped with adequate literacy skills. However, various surveys have shown that this cannot be taken for granted.”

(UNESCO, 2023, p18)

Low literacy as a global challenge

Low literacy is not just a challenge in the Netherlands, it is a global problem affecting millions of people. Despite literacy being recognized as a fundamental right in the Universal Declaration of Human Rights (UNESCO Institute for Lifelong Learning, 2013), approximately 763 million youth and adults worldwide still struggle with simple reading, writing and math skills (Ulrike Hanemann, 2023; UNESCO Institute for Lifelong Learning, 2016). This lack of literacy limits personal development but also hinders economic progress, social stability and sustainable development of a country.

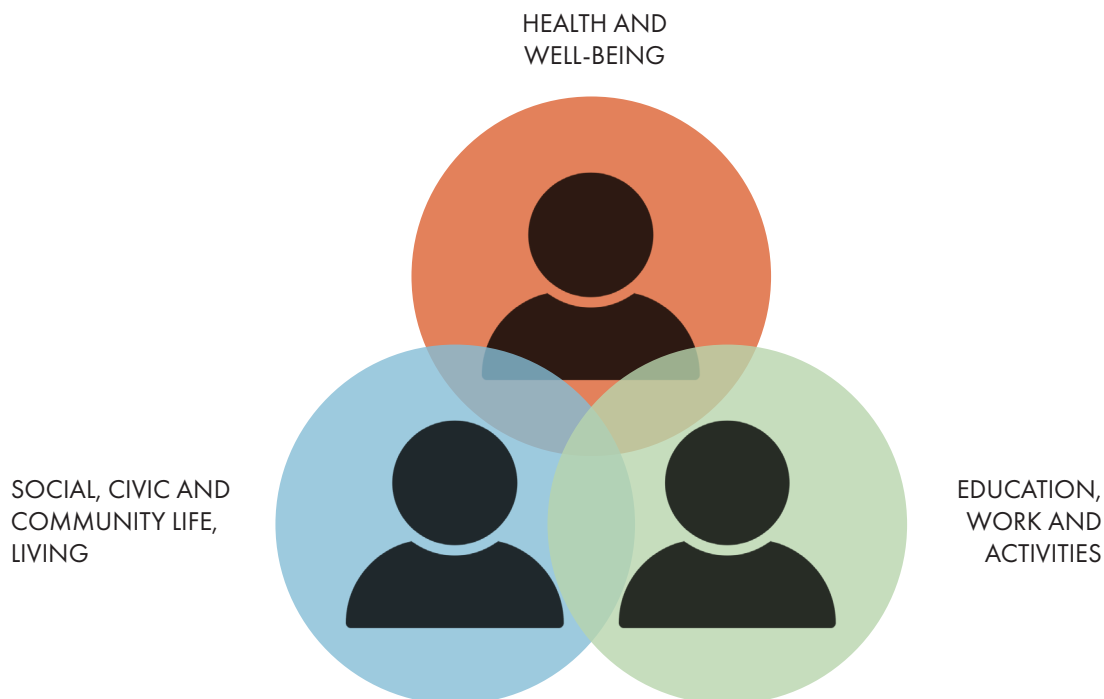
Literacy is essential to enable people to pursue other rights and freedom. As philosopher Amartya Sen asserts, literacy enables individuals to make informed life choices and Paulo Freire, an influential educator and pedagogue, emphasizes that literacy enables individuals to understand and shape the world around them (UNESCO Institute for Lifelong Learning, 2013, 2022).

In our current society, a digital age where information is increasingly or even solely provided online, literacy and digital proficiency are crucial for full participation in society. Digitization and technological advances have increased the need for people to critically evaluate information and use knowledge from a variety of sources (Stichting Lezen & Schrijven, 2018; Ulrike Hanemann, 2023; UNESCO Institute for Lifelong Learning, 2013, 2016). However, this poses a major challenge for people who struggle with literacy and digital skills.

The 2030 Agenda for Sustainable Development further emphasizes the importance of lifelong learning and recognizes literacy as an ongoing process that affects all areas of life, from work and health to citizenship and digital engagement (Ulrike Hanemann, 2023; UNESCO Institute for Lifelong Learning, 2016). Achieving these goals requires accessible and inclusive learning opportunities for all.

Figure 3

This diagram visually represents the impact of low literacy skills on various aspects of life. The overlapping circles illustrate how challenges in one area can affect others, emphasizing the interconnected nature of literacy and its critical role in achieving overall quality of life and self-sufficiency (made by author, 2024).



Wicked-problem

"A social or cultural problem that is difficult or impossible to solve because of its complex and interconnected nature. Wicked problems lack clarity in both their aims and solutions, and are subject to real-world constraints which hinder risk-free attempts to find a solution" - Wong (2023)

Low literacy in the Netherlands remains a persistent, complex social issue, or so-called "wicked problem". The number of low-literate adults continues to grow, despite concerted efforts by municipalities, civil society organizations, and volunteers. Addressing this problem remains difficult because those affected are often a hard-to-reach group due to stigmas and social barriers that prevent them from seeking help.

As contributing factors, such as an aging population, migration, and language deficiencies among youth, continue to increase, it becomes clear that traditional educational interventions may be too limited in scope. However, current approaches to low literacy may be too limited to address the complexity of the problem. Experts such as M&G doctors Van Klei and Smit (2016) argue that more diverse and innovative approaches are needed.

It is therefore essential to explore broader solutions, including those that go beyond traditional educational techniques. One area often overlooked is the potential role of architecture and the built environment to contribute to solving complex social challenges such as low literacy. This research aims to investigate if built facilities in Rotterdam South can promote and encourage the development of literacy and digital skills among residents to contribute to a more inclusive and destigmatizing society.

A wicked-problem

The main question guiding this study is:

“Can built facilities in Rotterdam South contribute to improving literacy and digital skills among residents with a lack in basic skills?”

The following subquestions will help address this main question:

1. Which facilities and organizations in which location and context of Rotterdam South are currently promoting literacy and digital skills?
2. How do residents with a lack in basic skills perceive and experience built facilities in light of the stigma that exists on this topic?
3. What type of built facilities and environments would attract residents with a lack in basic skills to engage in literacy and digital skill development actively?
4. Which architectural and interior design elements of built facilities best support literacy and digital skill development?

Built facility

Building facility means any structure, open area, or object that accommodates or is intended to accommodate Residential, Civic, Commercial, Industrial and/or Mixed Use Activities (Building Facility Definition, n.d.).

Literacy

Literacy is the ability to read, write, understand, interpret, and create written and printed materials in various contexts, including personal, societal, and technological environments. It encompasses a range of skills—such as reading, writing, speaking, listening, and basic numeracy—and supports individuals in achieving personal goals, expanding their knowledge, and engaging actively within their communities and society. Literacy is also seen as a continuous process of skill development that enables people to reach their potential and

function independently in everyday life, meeting standards such as level 2F in the Language and Numeracy Framework in the Netherlands (Halewijn, et al., 2021; UNESCO Institute for Statistics, 2020).

Digital skills

Digital skills are the abilities to effectively use the Internet, apps, digital devices and software. They are divided into four categories: operational and technical skills, social and communication skills, information skills and content creation skills. Each type includes functional skills, such as using buttons and search functions, and critical skills, such as assessing the reliability of information, understanding online advertisements, and ethical choices in online interactions (Halewijn, et al., 2021).

To clearly define the scope and narrow the focus of this research, the target groups that are included and excluded from the study are identified.

Inclusion:

Low-literate (young) adults (ages 16 to 65): This includes both people with a Dutch background (NT1) and people with a migration background who speak Dutch as a second language (NT2).

Youth with a language delay (15-year-olds): Youth who fall behind in their language development and cannot function adequately in school, regardless of their language background.

Elderly (65+): Both NT1 and NT2 individuals, with a focus on improving/supporting reading, writing, and digital skills.

Exclusion:

People with intellectual disabilities (ZB): Individuals with cognitive limitations that prevent them from developing basic reading, writing, and digital skills.

People with mild intellectual disabilities (LVB): Individuals who have some learning potential but, due to their cognitive limitations, do not fall within the target group for basic skills support.

High-educated foreign nationals: Despite a potential language barrier in Dutch, individuals already possess a high level of general literacy due to their educational background.

NT1

'Dutch as a first language' refers to adults who have Dutch as their mother tongue or low-educated non-native speakers who can hold a conversation and discussion in Dutch (at least level 2F) and need support in reading and writing (Stichting Het Begint met Taal, n.d.).

NT2

Dutch as a second language. The term NT2 refers to the language education of people whose mother tongue is other than Dutch, where the purpose of this education is that they (further) acquire the Dutch language (Stichting Het Begint met Taal, n.d.).

Basic skills

Within adult education, basic skills refer to language, numeracy and digital skills for adults. Language skills include both Dutch as a mother tongue and Dutch as a second language. With sufficient mastery of these basic skills, an adult can function independently and self-reliantly in society (Halewijn, et al., 2021).

Limited basic skills

Limited basic skills indicate a level below the required MBO2 level. Adults with limited basic skills often experience challenges in full social participation, which can have adverse consequences for themselves and society (Halewijn, et al., 2021).

Going forward, this study uses the term "basic skills" instead of "low literacy," because basic skills include digital skills and has a less stigmatizing connotation.

Figure 4
Language level reference framework language and mathematics in the Netherlands (Guo, et al., 2024).

	Low-literate		Not low-literate		
NT1 Dutch as first language	Illiterate	1F	2F	3F	4F
NT2 Dutch as second language	A0	A1-A2	B1	B2	C1-C2
Similar level of education		End of elementary school	End vmbo and mbo 1,2,3	End mbo-4 or havo	End vwo-hbo/wo

This research investigates whether built facilities in Rotterdam South can contribute to improving literacy and digital skills among residents. Several methods will be used for this purpose. The methods will not all be carried out linearly but will overlap.

To lay a strong foundation, a literature review will examine low literacy in the Netherlands, specifically in Rotterdam South, analyzing its causes, impacts, and policies. National and local policy documents from sources like the Dutch government (Ministerie van Onderwijs, 2013), the Municipality of Rotterdam (Gemeente Rotterdam, 2019, 2022; Gemeenten arbeidsmarktregio Rijnmond, 2020), and international organizations like UNESCO (UNESCO Institute for Lifelong Learning, 2022) will be reviewed using academic databases like WorldCat and Google Scholar.

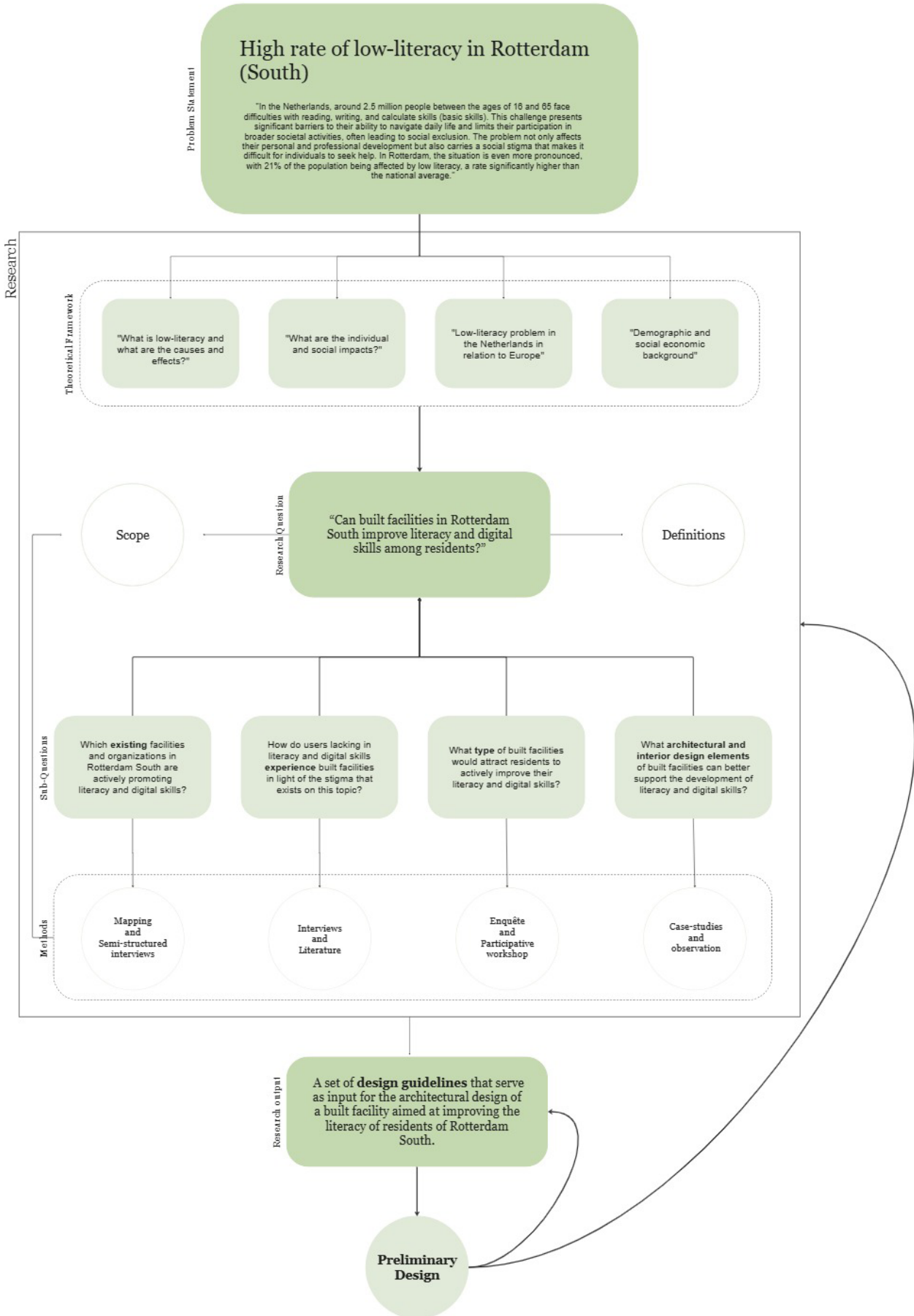
The demographic and socioeconomic characteristics of the target groups in Rotterdam South will be mapped using resources such as Wijkprofiel (Gemeente Rotterdam, 2024), Gezondheid in kaart (GGD Rotterdam Rijnmond, n.d.), and Onderzoek010 (Gemeente Rotterdam, n.d.-b).

A mapping analysis of existing facilities that support literacy and digital skills will be made, drawing on sources like the Municipality of Rotterdam's Word beter in Taal map (Gemeente Rotterdam, n.d.-c) and the Veldacademie's Leefvelden-dashboard (Veldacademie, n.d.). In addition, interviews with representatives of community centers, libraries, non-profit organizations, educational institutions, and welfare organizations in Rotterdam South, will provide insight into the role and effectiveness of these facilities.

Interviews are conducted with the target group to understand the experiences of low-literate residents. The aim is to identify the perceptions, experiences, and possible stigmas that users experience when using these facilities. In doing so, ethical protocols of the TU Delft (HREC) must be taken into account so that participants are informed of the purpose of the study and that anonymity is maintained at all times.

A visual survey of Rotterdam South residents will help identify building types perceived as inviting and destigmatizing. Participatory workshops will then involve the target group in designing ideal facility concepts that align with user preferences.

Finally, case studies of successful literacy- and digital-supportive (built) facilities in and outside Rotterdam South will be conducted, alongside observations of local sites to analyze design elements, user flows, and accessibility. The findings will inform architectural and interior design recommendations tailored to Rotterdam South's needs.



From words to space

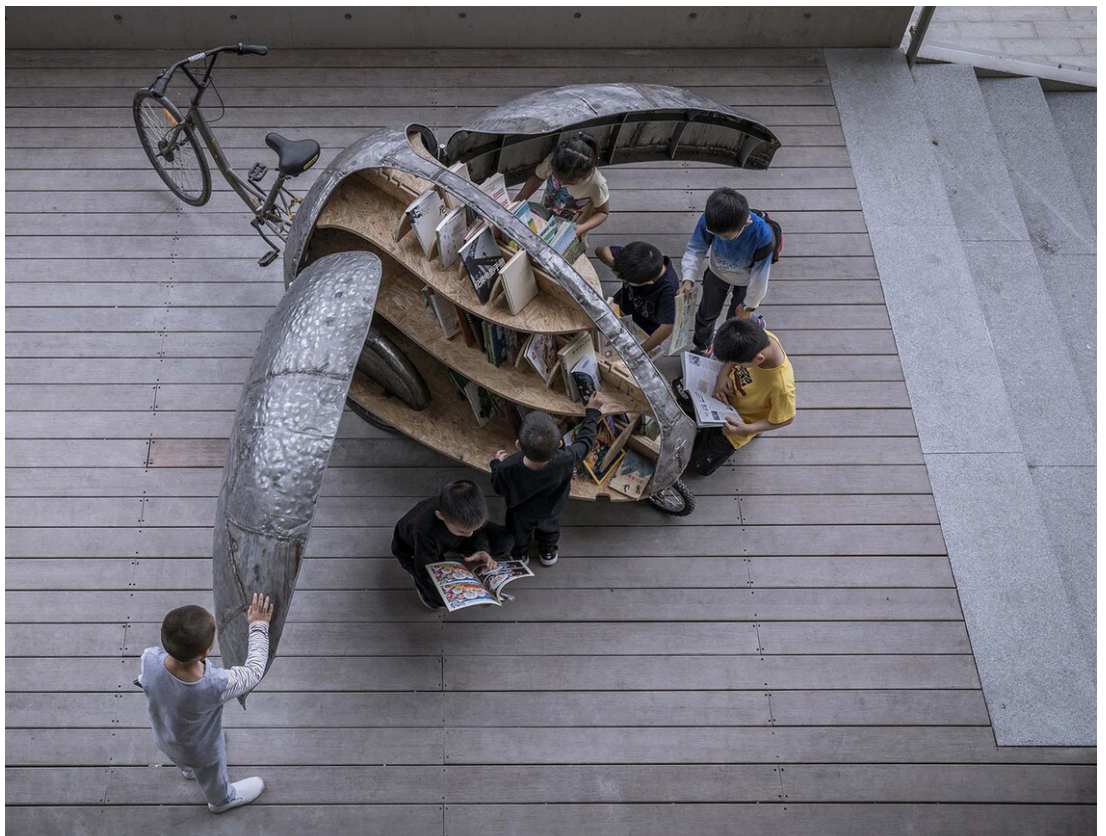
This research is conducted for architects and forms a critical foundation for subsequent architectural design work. The primary aim is to develop a set of architectural design guidelines for a built facility that enhances literacy among the residents of Rotterdam South. These guidelines will be visually represented to communicate the written research findings.

To translate these research findings into concrete spatial interventions, pictograms will be developed to visualize these guidelines at three scale levels: the neighborhood, the building, and the interior. These pictograms can be inspired, for example, by the concept of “patterns” as described by Christopher Alexander (1977) in his book *“A Pattern Language: Towns, Buildings, Constructions”*.

Additionally, the guidelines will be categorized according to their relevance, enabling a prioritized framework for the architectural design process. This will ultimately provide a clear and applicable set of guidelines for the design phase.

Photograph

Shared Lady Beetle, A micro movable library for kids designed by LUO studio in Beijing. Photographer Weiqi Jin (2019) retrieved from Archdaily on 31st of October 2024.



Design goal

The design goal is to create an accessible, multifunctional public space that encourages language and reading development among residents of Rotterdam South. This space functions both as a community center and social meeting place, with low-threshold accessibility and inclusiveness at its core. The design uses repurposing an existing building or a flexible, relocatable system that can be easily used in different neighborhoods. The space not only promotes individual language skills but also strengthens social cohesion in the neighborhood by providing an environment where learning, meeting and collaboration go hand in hand.



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