

DESIGNING DEAF SCHOOLS

A research plan on how to design schools for the deaf and hard-of-hearing



FASCINATION

I have been intrigued with the deaf community and sign language since I was little and in 2019 I finally decided to start learning the language. This is where I realised for the first time how easy my life is as a hearing person by noticing the problems deaf and hard-of-hearing people face in daily live. My intrigue turned into a fascination and I decided to take it with me in my studies. This resulted in my MSc2 elective *Form and Inspiration*, where I studied the movement of sign language, and in my MSc2 thesis, where I researched DeafSpace, an architectural approach to adapt the built environment and improve how spaces are designed for deaf and hard-of-hearing people. During the writing of this thesis my fascination grew even bigger. I became fascinated by DeafSpace because it forces me to look at the built environment in a different way. It teaches me and I think everybody else to create a better built environment that is more inclusive. I think that is important for everybody, not just me.

BACKGROUND

A total of 1.5 million people in the Netherlands are deaf or hard-of-hearing (Kentalis, 2021). That is a percentage of 8.6%. But it has to be mentioned that the majority of this group becomes deaf or hard-of-hearing later in life. If we look more specifically at the distribution among children in the Netherlands, 1 in 1000 people are born deaf, and 1 in 1000 people become deaf later in childhood (Smeijers, 2019).

HISTORY OF THE DEAF AND HARD-OF-HEARING

The history of the deaf and hard-of-hearing in the Netherlands is virtually unknown among hearing people. This is partly due to the fact that many sources about the history of the deaf and hard-of-hearing are fragmented and scattered throughout the country. A large part of the information has even disappeared, because in the past the information was not or carelessly stored (Dovenschap, 2015a). Only at the end of 2021, an initiative to store documents and information about the history of the deaf was started. A first step has been taken to make an inventory of tangible and intangible things of historical and cultural value to the Dutch deaf community (Dovenschap, 2015b).

For centuries, the deaf have been seen as second-class people (De geschiedenis van gebarentaal, 2020). Many people who were born deaf or hard-of-hearing have difficulty speaking because they cannot hear sounds and therefore cannot reproduce them. Deafness was therefore seen as a lack of intelligence, or as a divine punishment. As a result, many deaf people fell out of society. They therefore founded their own communities during the Middle Ages, in which the deaf developed their own way of communication with hand signs and lip reading, also known as the first forms of sign language (De geschiedenis van gebarentaal, 2020). However, this was not yet a real language in its own right, and the first steps towards such a language were not taken until the eighteenth century, during the Enlightenment. The need came to teach the deaf to communicate (De geschiedenis van gebarentaal, 2020). Monk Charles-Michel de L'Épée founded the first real school for the deaf in Paris. Around the same time, in 1778, Samuel Heinecke also founded a school for the deaf in Leipzig (Schermer, 2016). However, the two schools had a big difference in teaching methods. In Paris, teaching was based on sign language, while in Leipzig it was based on lip reading. Despite this difference, the goal remained the same: to teach the deaf to communicate. As a result, more schools appeared in Europe. The Netherlands also followed suit: in 1790, Henri Daniel Guyot founded the first Dutch school for the deaf in Groningen (Schermer, 2016). However, a discussion arose about which method of teaching was better: sign language or lip reading? More than a century later, the discussion 'came to an end'. Scientists gathered to decide on the method of teaching. The first conference in Paris ended in a row, but at the second conference in Milan in 1880, the decision was taken. Lip reading was decided on as the best teaching method. As a result, sign language education was banned throughout Europe. It was not until 1980 that this ban was lifted (De geschiedenis van gebarentaal, 2020). If we specifically look at the Netherlands, we can see that deaf people continued to use sign language among themselves during the ban. The result was the alienation of the deaf within the hearing world. Something that is still noticeable today. This continuation of sign language led to the creation of five 'sign language dialects' in the variously established deaf schools in the regions of Groningen (1790), St. Michielsgestel (1840), Rotterdam (1853), Voorburg (1888) and Amsterdam (1911) (Pyfers, 2020). After 1980, the use of sign language slowly returned to the Netherlands and to education. In 1995, Henri Daniel Guyot's school for the deaf in Groningen became the first to teach in sign language. Schools in the rest of the country soon followed (Schermer, 2016). The issue however, became that there were five different 'sign language dialects' in the Netherlands. On the basis of an extensive inventory of all five dialects, from 1999 to 2002 the standardisation of Dutch Sign Language was introduced (Schermer, 2016). This marked the creation of Dutch Sign Language (NGT, Nederlandse Gebarentaal), but the language was not recognised as an official language until 1 July 2021 (Ministerie van Algemene Zaken, 2021). This was the result of years of lobbying and, as a final push, the presence of Irma Sluis and other sign language interpreters at the Covid-19 conferences. With the legal recognition of NGT as a language, the government is obliged to encourage NGT in society. This means that in crisis and emergency situations, messages are now translated into NGT by default, someone who speaks with NGT can now use it during a court case, signers may take an oath, promise or affirmation in NGT and speeches by, for example, members of the cabinet are translated into NGT by default (Ministerie van Algemene Zaken, 2021).

PROBLEM STATEMENT

When we experience a space, we experience it through our senses (Marinova, 2019). Sounds, smells and textures can strongly affect our experience of a space, making architecture sensory. We use the information from our eyes, ears, nose and skin to understand a space and what is occurring there (Blesser & Salter, 2009). But what happens when one of your senses is absent or impaired? What happens if you are deaf?

SENSE OF (NOT) HEARING

Our sense of hearing has a big impact on our experience of a space or situation. Sounds connect us to each other: the sounds of footsteps on a floor lets us know that someone is approaching, hearing someone whistling signals comfort, raised voices in a heated discussion indicates conflict and the sound of sirens warn us for danger. From a biological and evolutionary perspective, our sense of hearing enabled our ancestors to locate prey and predators, making hearing an important prerequisite for survival (Blesser & Salter, 2009). Another function of sound is to give signals to help us move through a space. This is similar to how the blind move through a space. Blind people can 'see' by listening carefully. The tapping of their white canes and the change in frequencies helps them orientate and navigate, also known as echolocation (Toegankelijkestad, n.d.). Without these auditory signals, we are less able to navigate: imagine walking through a room with headphones blaring loud music, we become less confident as we have become functionally deaf to auditory signals that we unconsciously use to navigate (Blesser & Salter, 2009).

Deaf and hard-of-hearing people do not have these auditory signals. They can not hear people approaching or use sounds to help them navigate. Their sense of hearing is absent or impaired. When a sense is absent or impaired, changes in the brain improve the use of the senses that are present (Napoli, 2014, p.211). Deaf and hard-of-hearing people compensate for their hearing loss through extraordinary sensory "super powers" (Holmes, 2017, p.181). One of these "super powers" of the deaf and hard-of-hearing is heightened visual sense. In his research Renard (2004) describes this as follows: *"The deafness is not the world of silence, but that of the vision. It is through the vision that deaf people compensate deafness"*. Padden and Humphries talk about the same concept in their research on deaf culture but added more to it (2006, p.2): *"Deaf people's practices of 'seeing' are not necessarily natural or logical, in the sense that they have a heightened visual sense, but their ways of 'seeing' follow from a long history of interacting with the world in certain ways—in cultural ways."* Think about the schools they attended, the communities they got involved with, their jobs and the language they created to communicate (Padden & Humphries, 2006, p.2). Deaf and hard-of-hearing people have learned to 'see' sound through visual cues. Bahan uses the following example in his essay (2014, p.241): *"Say a deaf person is walking somewhere and he notices several people looking in the same direction. He will know something is happening and will look also to see what the commotion is about."* Understanding situations like these and seeing sound comes with a great deal of practice. Constantly being aware of your surroundings is based on a visual way of being, and deaf and hard-of-hearing people can often identify in a crowded room which of them are deaf or hard-of-hearing just by noticing how they use their eyes (Bahan, 2014, p.241). Additionally the deaf and hard-of-hearing have heightened tactile senses (Napoli, 2014, p.222). They can 'hear' sound by feeling vibrations. Bahan describes this feeling of vibrations by 'tactile parties' (2014, p.245). He illustrates a rock festival for the deaf and hard-of-hearing with extremely loud music in an enclosed space, where sound bounces off the walls like echoes. The music can be felt in your body (Bahan, 2014, p.245). But the sense of touch not only focusses on vibrations: deaf and hard-of-hearing people use touch to attract each other's attention and to express emotions (Napoli, 2014, p.223). They tap another's shoulders to get their attention or use touch during a signed conversation to signal someone's intention to speak next (Holmes, 2017, p.188).

The deaf and hard-of-hearing have long been aware that their perception of the world is unique, experiences that may not be explained scientifically (Holmes, 2017, p.181). But this different perception and different way of approaching the world can also lead to anxiety. For example some deaf and hard-of-hearing people have a lot of worry in their daily lives: What if I don't hear something important? What if I misunderstand someone and embarrass myself? What if my hearing aid batteries run out (Ehrenfeld, 2021)? Problems that can have a lot of impact on someone's confidence or self-esteem. Or if we look back at how our ancestors used sound to locate prey and predators, the inability to do so can lead to anxiety (Blesser & Salter, 2009). And if you cannot hear sirens, you cannot be warned. It can give deaf and hard-of-hearing people the feeling of being unsafe (99% Invisible, 2020). These feelings of anxiety and being unsafe also occur in the built environment. As stated in Coolen's research (2021) the deaf and hard-of-hearing live in world that, from an architectural standpoint, is designed for hearing people. Which causes a set of challenges for the deaf and hard-of-hearing: uneven pavements, unexpected steps - both of which can cause a person to fall when they are concentrating on a

signing conversation-, narrow hallways, poor lighting and glares - both of which can make readings someone's face and lips more difficult-, to name only a few of these challenges (Hales, 2017). Furthermore spaces designed for the hearing, can give the deaf anxiety – when you cannot hear footsteps from around the corner or behind you, you cannot prepare for who or what is around you (99% Invisible, 2020). For example, when walking together in conversation deaf people tend to keep a wide distance from another for clear visual communication using sign language. During a conversation signers will also shift their gaze between the conversation and their surroundings keeping a close eye for hazards and maintaining proper direction (Bauman, 2005). A corner wall, as seen on figure 1, will keep a person approaching out of view, meaning that the signers will have to stop their conversation once they reach the corner to avoid bumping into each other. Where hearing people can adjust their walking route by being alerted by the sound of footsteps, deaf people are not able to (Coolen, 2021).

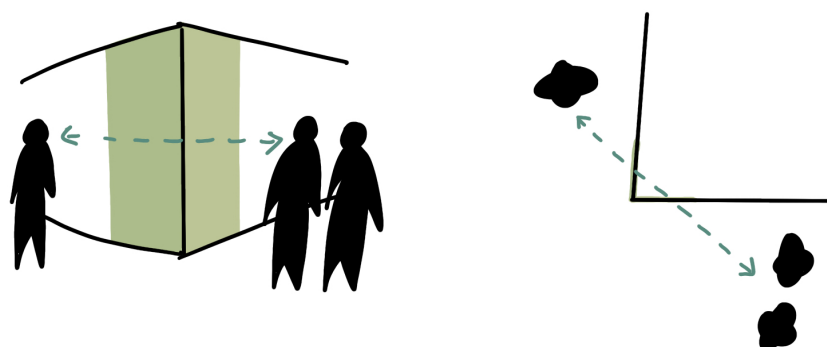


Figure 1. Coolen, J. (2022). Mobility and Proximity. [Illustration]. Based on <http://inclusion.vn/deaf/deaf-space/>

DEAFSPACE

The previous paragraph described two of the five design principles of DeafSpace (*Mobility and Proximity* and *Light and Colour*). DeafSpace is about creating awareness and it seeks to design and improve spaces to be functional for the deaf and hard-of-hearing. One place where the challenges from the built environment were particularly prevalent was Gallaudet University in Washington, a university for the deaf and hard-of-hearing. In 2005 the university assigned architect Hansel Bauman to make a design for their new and improved campus. To make this design Bauman, who is not deaf, collaborated with the ASL (American Sign Language) Deaf Studies Department for over three years to create the architectural approach known as DeafSpace (Gallaudet University, n.d.). Together they developed a framework of more than 150 design elements that impacts how the deaf and hard-of-hearing experience a space. These elements aim to address not only the practical needs of communication, but also the need we all have to feel safe and secure in our surroundings. The 150 elements can be placed in what has become the five principles of DeafSpace (Gallaudet University, n.d.): *Mobility and Proximity*, *Space and Proximity*, *Sensory Reach*, *Light and Colour*, and *Acoustics* (Coolen, 2021).

As of now two buildings on Gallaudet's campus are using these principles of DeafSpace. One of these buildings is the main building of the campus: the *Sorenson Language and Communication Center*, or *SLCC*, by SmithGroup, with deaf architect George Balsley serving as a consultant. The other is the *Living and Learning Residence Hall 6* of Gallaudet University, or *LLRH 6*, by LTL Architects in collaboration with Quinn Evans Architects. At present these buildings of Gallaudet University are the first and only full-fledged projects based on DeafSpace design.

DUTCH DEAF SCHOOLS

The focus of this research is not on everyday buildings, such as a train station, cinema or shopping centre, but specifically on one target group: schools for the deaf and hard-of-hearing. The many problems deaf and hard-of-hearing face in life and the built environment also have major effects at schools for the deaf and hard-of-hearing. These schools are mainly located in buildings that happened to be empty or that already had an educational function anyway. These buildings have never been specifically designed for the deaf and hard-of-hearing, which causes a problem. If a school for deaf and hard-of-hearing students was never designed for them, how can these buildings reflect and be good for them?

Learning originates from the perception and concentration of students in classrooms (Sanoff, 2004). But, as established, the deaf and hard-of-hearing have a different perception, which leads to a different way of learning. Deaf and hard-of-hearing students are visual individuals with specific cognitive skills, who pay great attention

to the perception of their surroundings. The difference between the cognitive development of deaf and hard-of-hearing and hearing students is in the way this knowledge is conveyed through language (Gaudiot & Martins, 2018). The world of a deaf and hard-of-hearing person is not of the hearing, but of the vision. It is with the eyes that the deaf and hard-of-hearing can 'hear'. Meaning that it is also with the eyes that the deaf and hard-of-hearing learn.

Deaf and hard-of-hearing children in the Netherlands can attend a special school for the deaf and hard-of-hearing, also called cluster-2 schools (Doof.nl, 2018). This can be either primary or secondary education. There are four types of school organisations in the Netherlands that offer education for the deaf and hard-of-hearing: Royal Kentalis, The Royal Auris Group, VitusZuid and VierTaal. Of these four, Kentalis is the largest in the Netherlands. Figure 2 shows an overview of the locations of these schools, both primary or secondary. They are marked per school organisation. The K stands for Kentalis, A for Auris and VZ for VitusZuid and VT for VierTaal.



Figure 2. Coolen, J. (2022). Deaf and hard-of-hearing schools in the Netherlands sorted by organisation [Illustration].

What is immediately apparent is the unequal distribution of schools throughout the country. On the Wadden islands, there is not a single school for the deaf and hard-of-hearing, and in the provinces of Zeeland, Gelderland, Flevoland, Overijssel, Drenthe, Groningen, Friesland and Limburg schools for the deaf and hard-of-hearing are only found in the larger cities. Meaning that if you do not live in one of these areas with schools, you have to travel a long way to attend a deaf or hard-of-hearing school. Furthermore, each school organisation has its own educational method and approach, and given the freedom of choice of parents, it is therefore also possible that one school will be better suited for a child than another. For this reason, it is possible that the closest school is not the most suitable school. As a result, travel times may be even longer.

RESEARCH QUESTIONS

The built environment has to change and be more inclusive. Deaf and hard-of-hearing students are visual individuals and the design of a school for the deaf and hard-of-hearing should be based on that aspect. Within this research it will be studied how to make this change happen, and how to design a school for the deaf and hard-of-hearing, by means of the following question: *How to design an appropriate school for the deaf and hard-of-hearing?*

SUB QUESTIONS

To help answering the main question the following sub questions will be resolved:

1. *What are the problems deaf and hard-of-hearing people can encounter in daily live?*
2. *What are ingredients for a PVE that can be abstracted from good and bad examples of schools for the deaf and hard-of-hearing?*
3. *How to translate social and behaviour requirements into design guidelines?*

METHOD

To answer all the research questions different methods will be used. For the first two sub questions, *What are the problems deaf and hard-of-hearing people can encounter in daily live?* and *What are ingredients for a PVE that can be abstracted from good and bad examples of schools for the deaf and hard-of-hearing?*, fieldwork will be done at Dutch schools for the deaf and hard-of-hearing by means of observations, interviews and mapping. Interviews will be held with both students, teacher and deaf and hard-of-hearing people not associated with schools. During the observations, a classroom, multiple hallways, the auditorium, outdoor area's and in some cases the library are examined and as to how the students and teachers use these spaces. Next to this a literature study on the deaf community and Gallaudet University and its principles of DeafSpace will take place. This will all lead to the method for the third sub question, *How to translate social and behaviour requirements into design guidelines?*, a pattern language. The elements of this language are units called patterns. Each pattern describes, by means of text and pictures, a problem that occurs in the deaf community and/or in deaf schools. The solution to that problem is then outlined.

THEORETICAL FRAMEWORK

No typical experience of being deaf exists, and deaf people do not form one unified social group. Every deaf person and also every hard-of-hearing person relates to their hearing loss in a different way (Holmes, 2017, p.175). How people 'label' or identify themselves is personal and may reflect someone's identification with the deaf and hard-of-hearing community, the extent to which they can hear, or the relative age at which they became deaf or hard-of-hearing (National Association of the Deaf - NAD, n.d.). Therefore, when talking about deafness in research and in life, many terms are being used: *deaf*, *Deaf*, *hard-of-hearing*, *late-deafened* and *people with hearing loss*, to name only a few. There is however, a difference between these terms. The term *deaf* is used to describe the condition of deafness and by some people the condition of being hard-of-hearing. The term *Deaf*, with a capital D, describes people that are part of the deaf community. It describes the cultural practises (Padden & Humphries, 2006, p.10). The term *hard-of-hearing* is used to describe people with a partial hearing loss. *Late-deafened* is sometimes used by people who later in life became deaf. Other people use the term *people with hearing loss* to describe people who are somewhere in the spectrum from being deaf to having a slight hearing loss, thinking this is inclusive and efficient (National Association of the Deaf - NAD, n.d.).

In this research the terms *deaf* and *hard-of-hearing* are used. This choice was made for the reason that deafness and hard-of-hearing are two different things: one does not describe the other. The term *Deaf*, with a capital D, is not used, because in this research no assumptions are made as to whether or not someone is part of the deaf community or feels connected to it.

EXISTING RESEARCH AND LITERATURE

Existing research and literature on being deaf and hard-of-hearing mainly focusses on deaf culture, including research by Stebnicki and Coeling (1999) and Humphries and Padden (2006) and literature by Ladd (2003), and what it means to be deaf or hard-of-hearing, such as research by Bauman and Murray (2014) and Holmes (2017). Some research has been done on how to create better spaces for the deaf and hard-of-hearing, such as

research by Hope (2017), however this research does not specifically talk about designing schools for the deaf and hard-of-hearing. More specific research on schools for the deaf and hard-of-hearing talk about the needs, abilities or social problems deaf and hard-of-hearing children face, including literature by Ramsey (1997) and research by Shaver et al. (2013), van Eldink et al. (2014) and Alramamneh et al. (2020), or examine the methods in which deaf and hard-of-hearing students should be taught, such as research by Cawthon (2004) and Gaudiot and Martins (2018).

Findings from these studies and literature will be included in this ongoing research. Information about deaf culture and what being deaf or hard-of-hearing means from research and literature by Stebnicki and Coeling (1999), Ladd (2003) and Humphries and Padden (2006) and Bauman and Murray (2014) and Holmes (2017), will help in the interviews and observations with and of deaf and hard-of-hearing people during the fieldwork. Hope's research (2017) on how more general spaces can be designed for the deaf and hard-of-hearing will help to form good design proposals for schools for the deaf and hard-of-hearing. The research and literature of Ramsey (1997), Shaver et al. (2013), van Eldink et al. (2014) and Alramamneh et al. (2020) on the needs, abilities and social problems deaf and hard-of-hearing children face, will not only help with the interviews and observations, but also help answering the research questions. Finally, the information on the methods in which deaf and hard-of-hearing students should be taught, from Cawthon (2004) and Gaudiot and Martins (2018), will also be useful in formulating the design proposals.

DEAFSPACE

In addition to all the research mentioned above, it is also important to look at DeafSpace. A lot of research has been done on this subject, such as Bauman (2005), Tsymbal (2010), Johnson (2010), Edwards and Harold (2014) and Harahap et al. (2020). DeafSpace uses its principles to guide the design of spaces for the deaf and hard-of-hearing, which is very valuable for this research. Furthermore, the buildings that exist today and use DeafSpace and its principles, the previously mentioned *Sorenson Language and Communication Centre, or SLCC*, and the *Living and Learning Residence Hall 6, or LLRH 6*, also provide much information for this research. What is particularly interesting are the findings and also problems that were discovered after these buildings were completed and during their use. These findings and problems will help in the formulation of the pattern language and may become part of it. Lastly, the principles of DeafSpace more focused on education will also be of great value for this research. They can help to create good design proposals for schools for the deaf and hard-of-hearing.

EXPECTED RESULTS

As stated, the findings of this research will be translated into a pattern language. These patterns form guidelines on how to design a school for the deaf and hard-of-hearing. These guidelines can be applied in the design, but can also be expanded while designing and testing through design. Some will be specific for a high school for the deaf and hard-of-hearing, others more general for schools for the deaf and hard-of-hearing or even general for reducing stress or increasing communication and perception by deaf people in architecture.

DESIGN

The guidelines will function as a hand book and inspiration for the design process of a high school for the deaf and hard-of-hearing, located in the Netherlands.

LOCATION

Based on the research on the location of existing schools for the deaf and hard-of-hearing multiple possible locations have been chosen for the design (figure 3). These locations are in places where there are few or no schools for the deaf and hard-of-hearing. On the Wadden islands, there is not a single school for the deaf and hard-of-hearing, and in the provinces of Zeeland, Gelderland, Flevoland, Overijssel, Drenthe, Groningen, Friesland and Limburg schools for the deaf and hard-of-hearing are scarcely found.

As a next step, several possible cities have been chosen within these locations. Due to better accessibility, the larger cities within the locations were chosen. This is based on the fact that there is a shortage of schools for the deaf and hard-of-hearing, which results in a very large radius from which children come to school. This in turn leads to long travel times to school. An easily accessible city is therefore important. The following cities

will be researched for a suitable and inspirational location: in Gelderland, *Apeldoorn* en *Deventer*, in Flevoland, *Lelystad*, *Almere* and *Emmeloord*, in Friesland, *Leeuwarden*, *Drachten* and *Heerenveen*, and in Limburg, *Venlo*, *Roermond* and *Maastricht*.



Figure 3. Coolen, J. (2022). Possible locations deaf and hard-of-hearing school [Illustration].

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