

Learning in the museum

An Inclusive Prehistory Game by the Blind and Visually Impaired. Creating an Inclusive App Game on Prehistoric Archaeology with the BSVN e.V. for the Permanent Exhibition of the Neanderthal Museum

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Abstract

Can an app game make a museum exhibition on prehistoric archaeology more accessible for guests with visual impairments? This is the research question of the NMsee project, a cooperative undertaking of BSV Nordrhein e.V. and the Neanderthal Museum in North Rhine Westphalia, Germany. Archaeological

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museum exhibitions focus largely on visual information transfer and work with non-inclusive underlying concepts of learning and knowledge, which lead to seemingly unbreachable difficulties for blind and visually impaired museum visitors. The approach of the NMsee project is an inclusive one: by creating an app game in the museum which communicates archaeological information in a non-visual way and which can be played independent of one's visual abilities, the project searches for inclusive ways of museum experiences. The game is created through a participatory and iterative process in order to stay in close contact with the needs and wishes of its target group. Starting in January 2019, the first prototypes and testing sessions will be launched in autumn 2019. This chapter presents the project idea, the problems leading to this research and the future goals of this undertaking.

Keywords

Games, Blindness, Archaeology, Museum, Neanderthal

Problems with being a (blind) museum visitor

The visually focused museum exhibition is not an inclusive concept. This is especially true for blind and visually impaired museum visitors, who have almost no access to the information and culture presented in archaeology museums. Exhibitions tend to encode all information in the archaeological original object, exhibition texts or their architectural qualities. Being unable to encode these informational symbols, whether due to a physical impairment, an attentiveness disorder or simply 'museum fatigue', eventually means having no or very restricted access to that valuable scientific information and culture.

To be precise, this instance alone is already *not legally compliant*. After all, public cultural institutions in Germany (such as museums, science centres and memorials) are – according to current German law (see e.g. UNO-Generalversammlung 2007; Ministerium des Innern des Landes Nordrhein-Westfalen 2003; 2018, §49) and the Universal Declaration of Human Rights (see Articles 22, 26 and 27 of United Nations 1948) – obliged to make their cultural property accessible to all people, including those with physical or mental impairments.

Aside from the obvious difficulties of visitors who cannot focus on or cannot see the museum's vast visual information (both textual and figurative), most exhibitions in archaeological museums have underlying concepts which create much deeper problems by preventing the creation of other, more inclusive ways of experiencing a museum visit. The following concepts seem the most problematic to me when trying to conceptualise inclusiveness in the museum exhibition:



Figure 1: Museum exhibits hold valuable information encoded inside. Without wider access, such as tactile copies, this information remains restricted for guests with visual disabilities. © Neanderthal Museum.

- a positivistic conceptualisation of knowledge;
- a behaviouristic conceptualisation of learning;
- communicating knowledge as a unidirectional, linear process;
- our medical-rehabilitative explanatory model of physical and mental impairments.

Why are these concepts defined by me as exclusive or non-inclusive?

The concept of knowledge generally used in museums and their exhibitions is a *positivistic* one, which outlines knowledge as a clearly definable entity, independent of both teacher and scholar, existing outside both in an unchangeable form (Hein 1998: 18). I prefer the concept of Hein's 'constructivism' for both knowledge and learning (Hein 1998: 34), which allows for more diverse modes of learning and communicating knowledge to learners with special needs, though also making the evaluation of learning success more complex and difficult.

Hand in hand with a positivistic concept of knowledge comes a *behaviouristic concept of learning*. Learning is conceptualised as the gradual, structured accumulation of facts and information (Hooper-Greenhill 2007: 39–40). This is a passive, unidirectional form of science communication and knowledge transfer, which does not allow adapting the mode of teaching to the individual's needs. Based on these concepts, the general mode of communication in a museum exhibition is a *unidirectional, linear process*, in which predefined, encoded knowledge is handed to the passive learner (Hooper-Greenhill 1994: 69–70). This again does not allow the learner to bring in her or his individual needs, experiences and questions, which is needed when wanting to communicate knowledge to a diverse audience.

In addition to changing the underlying concepts of our museum work, our modern-day conception of physical and mental impairments is changing. The formerly valid explanatory model for impairments was a *medical-rehabilitative* one. It defined disability as a deviation of body, mind and soul from a socially recognised norm which must be eliminated, treated or avoided. Compared to this, the newer social explanatory model conceptualises disability as being disabled by a social association when conducting certain activities. From this point of view, one's disability is – in resemblance to the concept of gender – a property assigned to oneself by society (Scharringhausen 2011: 26–27, 68).

By rethinking concepts of disability, we have the chance to see the non-visibility of blind and visually impaired museum visitors as an unconventional and new approach to the archaeological content we want to provide them with. With a new toolset built from the described concepts, new inclusive modes of exhibition experience can be found.

Why research blind museum visitors?

One might ask oneself why there should be a discussion about inclusion in museums – especially archaeological ones – at all. Is the group of disabled people in Germany and Europe not a minority, unauthorised to ask for research funding and investment? The simplest argument for answering this last question with 'no' is also the answer to the latter question: together with our *demographic change and rising life expectancy*, the number of people with physical and mental impairments is ever rising – not much of a surprise, if one thinks of the correlation between advanced age and health issues (see e.g. Bertelsmann Stiftung 2015). The rising number and thus also growing political power of a former minority of people with disabilities should motivate museums and other institutions of science communication to rethink the relevance of inclusive access to the culture and information preserved by them. As mentioned earlier, the *free access to knowledge, education and lifelong learning is an essential human right*, already defined centuries ago. This is of special importance when it comes to granting or obstructing access to scientific information in museums. Additionally, the examination of the antithesis to classic visual-focused



Figure 2: Using the personal smartphone in the Neanderthal Museum is no technical problem for visually impaired guests. © Neanderthal Museum.

museum visiting – that of being ‘non-seeing’ – gives us a valuable starting point when searching for new museum experiences for all our visitors.

How to be a blind smartphone user

Those readers who are accustomed to gaming and smartphones might now rightly think: aren’t both gaming and the use of smartphones very visual processes? How can these help blind and visually impaired museum visitors?

The smartphone is a technical innovation of the 21st century,¹ which by now defines so much of our everyday life that we interact with this medium on an hourly basis. The information technology ‘smartphone’ differs from the formerly described ‘museum exhibition’ medium in many ways, thus I will only point out the most relevant ones for this text:

- Smartphones are *created for an individual* user, not a mass of visitors.
- Smartphones *react* to the input we give them.
- On the basis of this input and their ability to react, smartphones *adapt* to their users.

¹ In January 2007, Steve Jobs introduced the first iPhone. In October 2008, the first Android smartphone followed (Arthur 2012).

Based on these underlying dogmata, smartphones have become a popular medium for blind and visually impaired users by helping them in everyday situations. This is possible through so-called screenreader software, which automatically reads out or describes the text or label touched on the smartphone's screen. This software has opened a wide range of new possibilities of independence and self-determination for people with visual impairments (e.g. Neffe 2019). Well-known examples of apps for visually impaired users are Barcoo, TapTapSee, BeMyEyes or Greta, which assist their users at the supermarket, in the kitchen, at the cinema or when trying to identify an unknown object.

(Inclusive) apps at the museum

Smartphones are a development which museums (could) have not ignored. Nowadays, a rising number of German museums offer their visitors their own smartphone application. According to a nationwide report from 2017, out of the 477 German museums 265 offered visitors their own app, while 214 museums provided a multimedia guide or tablet-guided tour (Institut für Museumsforschung 2018: 62). The Neanderthal Museum, for example, published its 'Neanderthal App' in 2012 and this has now been downloaded from Google Play Store more than 10,000 times. Both references illustrate the museum landscape's and the audience's rising interest in museum apps. Museum apps personalise the guests' visits and try to offer information on demand. They have the potential to introduce interactivity to the museum visit: visitors choose how to receive what kind of information, and in which media form, and can give direct feedback. Museum apps seem a more active alternative to the generally passive, unidirectional information transfer in museums and adapt to the communication form of the visitor's everyday life.

Besides the general trend in the museum landscape of adding such apps as described above, several museums have encountered the potential of smartphone applications for inclusion, especially for blind and visually impaired museum visitors. German best practice examples are the Berlinische Galerie ('Berlinische Galerie – Ein inklusiver Guide' at Google Play Store & iOS) and the SMAC, which is creating an inclusive app for its permanent exhibition. Generally speaking, these applications are accessible versions of museum audio guides and multimedia guides. These inclusive museum apps are an important step towards accessible museums indeed – but can we take the idea further?

Inclusive gaming – is that even possible?

Most questions I get asked about my work are probably based on the following underlying assumptions: blind and visually impaired people might be able to use a smartphone but cannot play a game on a digital screen-based medium.

Fortunately, accessible game design has opened the wide world of gaming to people with visual disabilities. This world is ever-growing: with 34.3 million Germans of different ages and genders playing games in 2019, every second German citizen is a ‘gamer’ (game – Verband der deutschen Games-Branche 2019: 6). In addition to that, the number of gamers aged 50+ is rising as well, and with 18.6 million users playing games on their smartphones, the smartphone is the favourite game platform in Germany (see *ibid.*: 8–9). These numbers illustrate the common use of app games in German society, as well as the potentially wide usage of app games by visually impaired players.

Accessible game design for blind and visually impaired people is a niche being filled by the gaming industry already. A both informing and enjoying list of such inclusive games can be found online on the website of the German Federation of the Blind and Partially Sighted (DBSV) (DBSV e.V. 2019). Creating these games can be done by adjusting and labelling all buttons and lines of strategy games or text adventures for screenreader software, by adding a lot of sound information to classic jump-and-run adventures or by creating something completely new based on the experience of non-visibility, as done in audio games (e.g. see *Sound of Magic*, *Blowback*, *The Nightjar*, *Papa Sangre*, *Frequency Missing*). These games do not only adapt to the special needs of their players. Instead, their whole game world and concept is based on ‘not-seeing’, by combining the immersive experience of a well-written audio drama with the evenly immersive concept of gameplay and game mechanics. Wilhelmsson et al. (2017) have shown us how such inclusively designed app games can provide a shared and equitable experience for users with and without visual impairments (see *Frequency Missing*, a free-to-use audio game available at Google Play Store & iOS) – and, by that, creating inclusion.

The NMsee Project

The immersion gained through games and audio drama, the accessible smartphone medium and the existing trend of museum apps are a set of potentialities which have not been combined until now. NMsee aims to fusion these potentialities in an audio-focused museum app game with accessible game design, and, in so doing, creating an inclusive and informative museum experience within the permanent exhibition of the Neanderthal Museum. The exhibition received its last update in October 2016 and currently offers many stations with touch and audio elements. On this basis, and with the support of Stiftung Wohlfahrtspflege, NRW Stiftung, LVR, Kämpgen Stiftung and NEAGES, BSV Nordrhein e.V. and the Neanderthal Museum launched the research project in January 2019.

NMsee aims to guarantee both an accessible permanent exhibition (through infrastructural factors such as a tactile guidance system, tactile labels or an indoor-navigation function within its new app) as well as a new access to

the permanent exhibition's content (through a new information layer: the inclusive app game).

The current concept for our NMsee game consists of a narrative-driven adventure through a purely auditive and touchable game world within the Neanderthal Museum. This game concept is based on the outcome of two project workshops conducted in March and May 2019, in which professionals from game, exhibition and audio design worked together with museum experts and people with visual disabilities.

Inspired by audio games such as *Sound of Magic* (Everbyte GbR, 2018), tactile tours and workshops, as well as existing inclusive apps, we create a playable, walk-through audio story. When entering the museum, visitors join a selectable game character, each character having a different perspective on the museum's content. The chosen character introduces her/himself to you and gives you a short tutorial on the screenreader-like gestures for interacting with the character and the game (swiping and tapping at different speeds and different directions).

After choosing your first travel companion – e.g. a female archaeologist or a Neanderthal woman – you follow the indoor-navigation function and the tactile floor guidance system into the permanent exhibition. While walking, you listen to an audio world, representing, for example, an Ice Age Neanderthal with one ear, spotting larger animals passing by, hearing the Düssel flowing close by and eavesdropping on a few fellow Neanderthals having a chat. When approaching one of the tactile stations within the permanent exhibition, the sound landscape will change and invite you to interact with a new tactile exhibit and with your travel companion. By touching the exhibit, listening to the surrounding soundscape and communicating with your companion through given options, you explore the different character narratives, whose stories are interwoven and influence each other. By following the different narratives, you will be able to solve a mystery, which connects the different characters of the game. In some side events, you can also collect hidden gems in the game, such as bad Stone Age-related jokes.

When approaching a tactile station, your travel companion will introduce you to a new chapter of your journey. She will ask you to search for a tactile detail on the given exhibit, e.g. trepanation holes on a Stone Age skull or the nose form of a Neanderthal figure. You can ask your companion to tell you her/his life story, details about the exhibit, scientific knowledge or simple fun facts – depending on the character you chose, the information will vary.

Through this game, we aim to create an even basis for all visitors to start their museum experience on. Within an adaptive and motivating learning environment provided by the game, a both inclusive and valuable museum experience for visitors regardless of their vision becomes more and more feasible. In addition, the chosen focus on audio information and interaction with the museum's exhibits keeps the visitor's attention on the museum visit and avoids concentrating on the smartphone screen.



Figure 3: In meetings such as our first concept workshop in March 2019, we continue to improve the existing game concept together with visually impaired and seeing testers as well as with game design specialists.

This game concept is now being developed further, sharpened and prototyped together with a game design company and visually impaired as well as seeing testers. The launch of our NMsee app game is planned for autumn 2020, before which we will have several open test phases for interested gamers, archaeologists and museumgoers – both blind and seeing – to join us for a test round.

Our foci for the upcoming concept and prototype phases will be the app games' technical specifications, the usability for blind and visually impaired users and the creation of a fluent and immersive narrative. The project will be accompanied by a dissertation at the Department of History of Heidelberg University, and will conclude with a publication on the findings on what and how games like NMsee can contribute to the inclusiveness of archaeological museums.

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