

Tell Me What I See: Universal design and educational video for inclusive digital education

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Abstract. In this paper, we present the film *Tell Me What I See*, a documentary about Simen, a student at NTNU with hearing and visual impairment. We present process elements from the idea to the finished product and elaborate on various interacting themes ranging from accessibility and constraints (defined by framework or standards) to artistic expression in telling a good story. By presenting the film in various contexts across campus and beyond, different aspects and functions evolve and show the film's many facets. First, it can act as a digital learning resource accessible in all learning spaces supporting various pedagogies like student-active learning with, for instance, group discussions and flipped classrooms. Secondly, it can act as a medium for raising awareness about the situation of students with disabilities (SWD) and be a starting point for discussion and reflection amongst all stakeholders within HE. Hopefully, the documentary can motivate and inspire humans to care for and engage in each other's well-being.

Keywords: Educational Video, Universal Design, Accessibility, AI, Documentary

1 Introduction

"Universities without walls" is the vision for 2030 by The European University Association. The vision is building on sustainable development, with diversity and social cohesion as essential components, providing and promoting equitable access and inclusion for students from all backgrounds. Hence, the future structure and development of the university must be able to provide a hybrid holistic solution, delivering open and accessible learning environments to accommodate a diverse student body and providing flexible, interdisciplinary, and multi-pathed ways to ensure that their learning is at the center of the process.

Giving the students the flexibility to learn anytime, anywhere, in any format requires rigid planning of accessing and moving between physical, hybrid, and online spaces, applying technology to access and interconnect people and resources within these

spaces. Finally, the pedagogical framework must be in the driver's seat to provide activities that enable the students to reach the intended learning outcome and to aid the teacher in producing relevant, accessible resources for the planned learning scenarios. [1]

Driven by developments in pedagogical methods and the pandemic, digital video use in higher education has exploded. Various formats and use cases are part of the universities' student offerings. Essentially, digital video is a powerful tool that expands learning possibilities, bringing visual demonstrations, real-life application of knowledge, unlimited revisions, and creative approaches to the learning content. [2-4]

In this paper, we present the film *Tell Me What I See*, a documentary about a student at NTNU with hearing and visual impairment. We will show process elements from the idea to the finished product and elaborate on various interacting themes ranging from accessibility and constraints (defined by framework or standards) to artistic expression in telling a good story. [5]

By presenting the film in various contexts across campus and beyond, different aspects and functions evolve and show the film's many facets. First, it can act as a digital learning resource accessible in all learning spaces supporting various pedagogies like student-active learning with, for instance, group discussions and flipped classrooms. Secondly, it can act as a medium for raising awareness about the situation of students with disabilities (SWD) and be a starting point for discussion and reflection amongst all stakeholders within HE. Hopefully, the documentary can motivate and inspire humans to care for and engage in each other's well-being.

2 University Without Walls

The term "a University without walls" is often used by Higher Education (HE) institutions and stakeholders to promote and gather various flexible activities and resources they can offer their students. It may be hubs for distance/remote teaching and learning consisting of shared physical or virtual resources and workspaces. Related activities utilize e-learning, mobile learning, various Massive Open Online Courses (MOOC) or Learning Management Systems (LMS), and audiovisual systems for streaming and conferences.

As stated in the Manifesto by Katia Ninnemann: We must expand beyond space barriers with a holistic understanding of the campus as a hybrid environment, merging physical-virtual spaces and formal-informal spaces. [6]

Seen metaphorically and ideally, the "Universities without walls", should comply with a Universal Design, being either a product or environment usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

Hence, there is a need for HE to produce strategies [7] for digital transformation to understand and have an impact on how digitalization affects society and individuals. The transformation may improve the products and services within hybrid learning en-

vironments from a lifelong learning perspective, making HE more accessible and delivering various new learning environments optimized for formal and informal learning.

The recent advances and developments in technology render possibilities to create realities accessed and controlled by interfaces and sensors. Virtual, Extended, Augmented and Mixed Reality (VR, XR, AR, MR). These technologies support immersive experiences and allow users to explore new arenas like the Metaverse for interaction, collaboration, and communication. In addition, the recent development within Artificial Intelligence (AI) technologies opens unknown territories with challenges and new possibilities. All elements represent steppingstones to plan and pave the path in a partly unknown landscape toward a University without walls, ideally delivering the same learning experience and access for all students.

However, seen from the perspective [8] of disabled students, many factors harm the learning experience and access to HE. For example, the additional time and stress involved in being a disabled student and organizing their own required support for access to rooms, information, exams, or in general, "making the system work". In the film, *Tell Me What I See*, these issues absorb much of the main character's energy. For him, carrying out ordinary activities requires both assistance and careful planning.

These vexing issues are not new but are perceived and handled differently depending on the stakeholder's role or perspective. The stakeholders range from the individual level as a student, teacher, or administrative staff, to the organizational level at the university and governmental and international institutions concerning strategies, standards, resources, and policies [9, 10]. When examining studies and papers from various countries, Several studies describe that students with disabilities experience a gap between their rights as expressed in policy and how their rights and issues are addressed in practice.[11] Hence, there is a need for awareness of student population diversity and practical knowledge on inclusive teaching with student variability in mind, leaving the "one size fits all" approach behind. [12]

3 Digital educational video

Digital educational video has become an integral part of university teaching, supporting student active and multimodal learning. In online learning especially, digital video is often the central learning object and often "...represents an essential point of contact between teacher and student as they replace the traditional lecture in the course." [13, 14]

The HE-video landscape has been occupied with talking head and presentation slide videos, [14] but there are examples of the use of different formats, also involving genres known from the industry such as animation, documentary films, featurettes, and dramatizations spreading into HE, [2, 3]. The competencies to produce these different formats are becoming increasingly present at universities. [13, 15] Typically, producing this type of content requires a cross-disciplinary approach, where academics work

together with video producers to create engaging video content to convey the learning content in alternative ways than recording a traditional lecture.

The benefits of videos in higher education include (Adapted from Dinmore, 2019):

- increased flexibility – time, place, speed, hearing ability;
- sense of personalization and social presence for the learner – especially in online courses;
- video allows for unlimited repetition and revision;
- perceived higher levels of student engagement;
- promotion of active learning pedagogies;
- additional language acquisition;

Professionals working with video for online teaching need to be aware of students' limited attention span [14] and how the use of digital video's *affordances* connects engagement to different video formats. There are also indications that well-produced marketing videos for online courses raise expectations for course content and that this causes dropout when the learning content does not meet expectations. [16] Looking at digital video as a personal, flexible, and engaging way of communicating with students opens up the unique affordances of video compared to text.

3.1 Design of digital video – how to do it?

Learning affordances can be seen as how technology functions extend our learning and perceptual capabilities [2]. It is evident that the video's design is crucial in succeeding in providing the benefits mentioned above.

Videos mimicking the traditional lecture require less effort from the educator, whereas producing more high-end content requires new skills and collaboration with media professionals [2, 13, 17] where content knowledge meets pedagogical and technological knowledge, also known as TPACK [17]. Learning the skills of communicating scientific content in video may prove valuable in terms of research dissemination and shows a general turn in academia towards visual media [18]

Planning, recording, and editing; all production phases require collaboration and different competencies, where Centres for Teaching and Learning (CTLs) can play an important part [19]. Even the activity of integrating videos into courses and teaching may require a different set of pedagogical skills and strategies. For instance, co-viewing of videos may improve the learning benefits. [20]

4 Accessibility and video

Videos need to be accessible in order to be able to provide added value for all learners. [21] Different approaches must be considered when producing educational video content, and sacrifices may have to be made. We will investigate if the requirements for accessibility, as pointed out in WCAG [22], and good practice coincide. In addition, the AI revolution is upon us and maybe a valuable ally when pursuing accessible digital education.

Access to education is crucial in a democratic society providing access to attractive careers and representation in influential societal positions. The right to education is both a part of the UN's sustainability goals and a part of Norwegian legislation. Through EUs Web Accessibility Directive [23], requirements for the Universal Design of video content are prevalent in HE institutions across Europe. Comparing these requirements with theories on good practice for educational video design reveals discrepancies and overlapping.

There are three critical requirements of universal design in learning videos: [22]

- Same-language subtitles (SLS)
- Audio description (AD)
- Inclusive use of graphics (Visual accessibility).

There are also other factors affecting the level of accessibility which can be mentioned, such as:

- Technical audio and video quality
- The tone of voice and language use
- Speed, pace, and other editing techniques

We can find evidence for these additional factors affecting accessibility, such as Mayer's Multimedia principles. [24] There are arguments that online learning using digital video, when executed correctly, can be more inclusive and appeal more broadly to learners than traditional lectures.

4.1 Where do the requirements and good practice coincide, and will there be trade-offs?

It is possible to see creative limits that the requirements may put on media designers, but it is also known that limitations can foster creativity [25]. Coming to terms with the fact that educational media represents something else than ordinary media production, as accessible media is a pre-requisite for having access to higher education, may give a different context for the media production. The variability in the target group shows that everyone benefits from universally accessible solutions [21].

The benefits from subtitling is clear and uncontroversial, it is seen as an integral part in streaming platforms, TV and cinemas. Dinmore [13] points at increased accessibility for deaf or hard of hearing viewers, improved comprehension for all students and enhanced foreign language learning as the added value that subtitles give. The flexibility to be able to watch videos in a noisy environment like on the bus or in the library with headphones is another. Subtitles are also non-intrusive as they can be toggled on and off, and produced in multiple languages. Studies on Same Language Subtitles show that adding captioning in learning videos increases learning in, for instance, languages, contradicting Mayer's "redundancy principle" [13, 24].

A recommended solution for the visually impaired is integrated audio or visual descriptions [22]. Following an oral presentation, visual cues are indeed support to the speaker. At the same time, giving cues on where to focus and what to read from tables or illustrations can be seen as a good presentation technique and sound pedagogy, according to Mayer. [24] Audio descriptions provide an extra soundtrack with the visual information that otherwise would be hidden from a blind or low-vision audience.

Graphical elements in the educational video is recommended through the WCAG guidelines to have proper contrast and not too small fonts. Another thing to mind is not having graphics obscured by the subtitles in the video. So, even though there are some limitations when producing accessible video, non-intrusive solutions, good presentation techniques, and conscious video design will leave frames to be creative inside.



Fig. 1. Poster for the short documentary Tell Me What I See (2023)

5 Tell Me What I See – a documentary

At NTNU, the work of staff training and strengthening the motivations of academic staff took the form of film production.[26] A film team followed a student needing accommodation on campus and in everyday situations. By having Simen, a student in sociology, tell the story of how limited vision and hearing affect his everyday life and studies and listening to his reflections, educators at the university should be better prepared to meet a diverse crowd of students in their classroom. Both know what practical adjustments are needed and see the person behind the needs.

The background for creating the documentary film *Tell me what I see* was a need to emphasize necessary accommodations for students with visual disabilities. New requirements for Audio Description of pre-recorded audiovisual material occurred in Norway in 2023, seemingly putting the extra workload on academics. The film aims to motivate educators to have students who benefit from universally designed content in mind when confronted with requirements of accessibility.

Testimonials like the one in the film *Tell Me What I See* can push the development of solutions to help students with the need for accommodations or Universal Design. Increased knowledge about universal design can also help promote more positive attitudes toward people with disabilities. [27] Furthermore, after watching the film, the effort of educators should be more targeted in investigating what resources are necessary to achieve the appropriate level of accessibility. Screening the film as an educational video can trigger discussions and support the target group with the mental context necessary to learn. [28]

5.1 Motivating academic staff

To put the need for accessibility in context: In 2019, 17.3% of all UK higher education students said that they had a disability of some kind, and the numbers are rising.[29] The effort required by the individual educator to ensure that digital learning material is accessible might seem daunting. Resistance in academic staff toward the necessary adaptations of learning material is a challenge that needs to be addressed.

The pedagogical aims of the documentary film are experience and identification with the main character, affecting the audience emotionally and possibly changing attitudes and creating a reflection. After screening the film, the discussion is an essential part of the pedagogical activity. Here students and teachers are encouraged to share their thoughts and have a discussion afterward.

Securing that the added value of these adaptations and the benefits are apparent is one of the tasks for CTLs.[19] Digital learning materials such as videos, online courses and other resources can shape attitudes to have inclusion and accessibility as a part of the institution's identity.

The film itself takes accessibility into account by having an alternative version with Audio Descriptions, as well as audio descriptions as well as captioning in both English and Norwegian. Also, parts of the film have integrated descriptions, as an interpreter who follows Simen gives him visual descriptions of his surroundings.

6 Artistic and practice-based methodologies

The strategies behind the film *Tell Me What I See* are similar to the advice for designing digital video for online learning. Giving access, using storytelling, and showing rather than telling are affordances used to present the situation of a student with disabilities [2]. These actions give context to the issue and interest in exploring the topic further.

By working practice-based with interviews and other observations with the camera, a goal is to reflect on the process as a filmmaker. Furthermore, to reflect on the creative process to find tools, models, theories, and concepts that can provide an analytical perspective to the creative process behind the fact-based film, providing a self-reflexive component in communicating the scientific content with cinematic devices and being able to work practice-based with one's reflections and ideas. [30]

This can be seen as an artistic research process, which methods are new and emerging connecting different kinds of understandings and knowledge together. "(...) Artistic research is understood as the general term with the subcategories practice-based and practice-led research." This quote from the Vienna Declaration on Artistic-research, shows a close correlation between practice-based methods and art-based research. [31]

The practice-based approach here explores the potential of shorter documentary films and contributes to creating new knowledge by developing "a space of constellations and connections where practices, methods, and understandings meet and shape new methodologies."

As we take our cameras out into the world to explore and record, we also travel with notions and concepts that speak powerfully to us. [30]

7 UDL and video

The Universal Design for Learning (UDL) framework [9] gives an overview of what inclusive education can entail. Concerning video, UDL is relevant when looking at the educational activities that video support. The UDL framework is a set of different strategies, and implementation in Norway focuses more on some parts of the framework than the whole. [32] The framework has met criticism but stands out as a guide for inclusive education, looking past technical requirements. Good teaching practice can be seen through many different lenses, and UDL is one of them. [33]

Putting learner variability in the center of teaching practice and ensuring that there is flexibility and variation in ways to engage with learning content, it is easy to see how video plays a part in this. Students producing their own videos can also support UDL teaching practice. Other relevant ways to use video to support UDL teaching practice are to facilitate group work, co-viewing of videos, videos in different engaging formats, and fostering discussions.

The three categories in the UDL framework are engagement, representation, and action and expression. As AI technology, including large language models, diffusion models, and others, increase in popularity and practical use cases, we will see this technology being important in accessibility. [34] AI technology excels at representation. Being able to transform words into images, interpret images, and give summaries from meetings and videos is already here. Even summarizing speech to make more precise and reader-friendly captioning is here through OpenAI's Whisper service. [35]

Looking again at the UDL framework, which at the time of writing is being updated to include other relevant barriers to learning such as ethnicity, class, and socioeconomic status, it looks like technology will help a lot in providing multiple means of representation when all privacy and data control issues are covered, leaving an exciting task for educators with a wish for universal design of their teaching: Providing multiple means for engagement and multiple means for action and expression for their students. [33]

8 Inclusive teaching futures

International and governmental strategies and policies envision transforming HE toward a technological and digitized future to improve the HE stakeholders' well-being and, hopefully the student's learning experience.

This move from the 4th to the 5th industrial revolution (IR) suggests closer human-machine cooperation fostering a creative approach using digital technologies like the Internet of Things (IoT) and AI.

However, the roadmaps for the dawn of the 5th IR do not reveal the bumps and roadwork ahead. Many factors influence the introduction, implementation, price, content, use, evaluation, and regulation of digital technologies within HE.

The big question for HE is whether these technologies are the emperor's new clothes or just a thread in a new fabric interviewing and covering human needs for equity and equality, technology, enabling communication, collaboration, and new sustainable ways of sharing resources and knowledge.

The Universities have built-in natural inertia for change, so the time from introducing new technology to implementation is often long. Nevertheless, at the same time, the

university has well-defined and reasonable frameworks for pedagogy, design of learning environments, and adapting technology to ensure the quality of the whole learning and teaching process.

Coinciding these frameworks[1, 9, 17, 36] with the Disability Inclusion Institutional Framework, (DIIF)[37] will create a strong structure in our new fabric to cover the needs of SWD.

The framework builds on three overarching constructs glued together by a "culture of shared understandings"

- Shared ownership: Disability inclusion as the responsibility of all.
- Empowerment: Focused on enabling access and addressing the physical and emotional labor involved in advocating for basic needs.
- Independence: Enabling disabled students and staff to have equal access to manage their HE context for themselves.

The best sustainable solutions seem to combine these existing solid frameworks caretaking the human aspect and where the integration and use of technology deliver added value and not stand out as a standalone solution for all challenges. The technology must be adaptive and evolving to handle various types of assistance that might change over time and act as an interface or tool to ease access to the interaction between people, resources, and spaces.

9 Conclusion

In this paper, we address a pragmatic approach toward education by using well-known and established pedagogical methods with video produced according to UDL standards. Aligning accessible design of educational videos that are accessible and used in UDL-informed teaching practice can be a powerful tool in providing access to education to more students.

Using a film like *Tell Me What I See* to promote openness, awareness, and inclusion across campus will create a strong commitment in students, teachers, and other stakeholders to put accessibility as a high priority. The DIIF builds precisely on the same values promoted by the film, and hence the film can act as a glue for shared understanding amongst all stakeholders within HE, when building and connecting various pedagogical and technical frameworks with humans in the center. In addition, we hope that the film can motivate students with impairments to put in the necessary effort to make the best out of their situation as students. And not to be afraid of telling the professor or other students about his or her situation and to be conscious of their rights.

We must put the human side first as a goal for technology development. Take advantage of the possibilities technology enables to leverage support for people with

disabilities to include more people in meaningful activities, job opportunities, and social participation. Looking at AI to offload the burden of providing multiple means of representation, the future can make room for teachers with resources to care for their student's well-being. The production, distribution, and scalability of accessible educational media depend on the powers of AI technology.

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