THE IMPACT OF DIGITAL TECHNOLOGIES ON THE CULTURAL RIGHTS OF D/DEAF AND HARD-OF-HEARING PEOPLE

Sofija Lekić

Sofija Lekić*

THE IMPACT OF DIGITAL TECHNOLOGIES ON THE CULTURAL RIGHTS OF D/DEAF AND HARD-OF-HEARING PEOPLE

Digital technologies permeate almost all spheres of human lives in contemporary times, affecting a number of aspects of people's lives. Such is the case with cultural rights as well, especially in the cases of certain groups. The paper is focused on the impact of digital technologies on these rights of d/Deaf and hard-of-hearing people. The theoretical framework of the paper defines the concepts of culture and general and specific cultural rights, as well as the labels of deaf, Deaf and hard-of-hearing. Then, an overview of relevant digital technologies is provided, with an evaluation of the impact they have on these cultural rights. Finally, possible strategies for improvement are broadly defined, and a conclusion is provided, summarizing the results of the research done.

Key words: *assistive technologies, cultural rights, Deafness, Deaf studies, digital technologies*

1. INTRODUCTION

During the last few decades, the world has borne witness to an incredible growth in the diversity and ubiquity of digital technologies, both those reserved to only certain groups of people and those available to the general public. Consequently, the impact of said technologies on the many areas of people's lives has broadened and intensified, making it an important subject to study and analyze. Among the many questions raised in relation to this, the impact of digital technologies on human rights has been one of those which attracted the most attention. In relation to this paper, the main topic addressed are the rights of d/Deaf and hard-of-hearing people – precisely, their cultural rights.

---

*   The author is an undergraduate student at the University of Belgrade – Faculty of Law and University of Belgrade – Faculty of Political Sciences, *sofia1054sofia@gmail.com.*

The paper is divided into three general, overarching sections. Firstly, the broad concept of cultural rights is examined. Attention is devoted to a number of different cultural rights, as well as the very concept of culture and its relation to some of the rights mentioned. Next, a section deals with the differences between the three labels concerning the group of people whose cultural rights are examined in the paper – the deaf, Deaf and hard-of-hearing people. Lastly, the third general section concerns digital technologies affecting the cultural rights of d/Deaf and hard-of-hearing people. A general overview of the most prominent technologies concerning this topic is given, and then an analysis of their effects on the cultural rights of d/Deaf and hard-of-hearing people is provided.

In the end, attention is drawn to the benefits provided by these digital technologies, as well as the main issues they cause in relation to the cultural rights of d/Deaf and hard-of-hearing people. The aim of the conclusion is to provide an evaluation of the current situation concerning the topic at hand, but also to give guidance for the future period, so that the power of digital technologies keeps on being harvested in the service of improving the cultural rights of d/Deaf and hard-of-hearing people, while being as little of a detriment to them as possible.

2. CULTURE AND CULTURAL RIGHTS

2.1. The General Concept of Culture

The exploration of the titular topic of the paper demands the provision of a solid theoretical framework preceding the examination of the practical aspects of the question posed. The concept of cultural rights, which is arguably the very core of the issue at hand, appears to be the most suitable starting point for this – nevertheless, its definition cannot be ascertained without first devoting attention to the concept of culture itself. Thus, it is necessary to consult a body of different conceptions of culture, in order to provide a well-rounded, multifaceted understanding of its meaning.

A broad idea of the concept may be found in its understanding as "[t]he product of the man, created through history and made by a row of previous generations, which every new generation adopts and adapts" (Stojković 1999, 36). However, the true meaning of the term

cannot be reached through the analysis of this definition alone; its complex nature dictates the existence of a plethora of its perceptions, making it necessary to consult some of the more elaborate definitions in order to gain a true understanding of its scope and variability.

The first question to be posed may be that of the justifiability of using the term "culture" with the intention and understanding of it signifying a single material concept. In effect, while "one widely accepted proposition is that there exists a 'universal' culture and that, while some people are able to enjoy it, others may not have access to it [...] [another interpretation defines culture as a] group's own culture, and not necessarily [...] some general or supposedly universal culture, because these two concepts are not necessarily coterminous" (Stavenhagen 2001, 88). As will be shown later on, when discussing the concept of cultural rights, the distinction between the subjects of the rights being defined as members of humankind on the whole, as opposed to their identification as members of a certain group, demands the taking into account of these differing views of the concept of culture in general.

The two conceptions of culture shown above have a significant impact on the importance of defining culture in a precise way, when it comes to the definition of cultural rights. Should the concept of one, "universal" culture be adopted, the cultural rights a person is guaranteed would be supposedly available and identical in their content to everyone. Also, the nature of the rights would be almost entirely individualistic – culture itself would be regarded as an abstract, overarching phenomenon, or a sort of a public good, which then every person would be entitled to. Yet, regarded through the prism of culture being understood as pertaining to a certain group, cultural rights become more of a communal concept, tied to the group as a social unit. Their content, thus, is not the same for all people; rather, a person's status as a subject of a certain cultural right is dependent on their belonging to a group which "owns" the culture in question.

Regardless of the singularity and/or plurality of culture as a phenomenon, its structure is complex and susceptible to different interpretations. One of these is provided by Rodolfo Stavenhagen, who recognizes three different aspects of the concept of culture: culture as capital – the "accumulated material heritage"; culture as creativity – "the process of artistic and scientific creation"; and culture as a total way of life – "the sum total of the material and spiritual activities and

products of a given social group which distinguishes it from other similar groups" (Stavenhagen 2001, 87–89). On the other hand, Pok Yin Stephenson Chow recognizes four different meanings of culture – culture as high culture, culture as popular culture, culture as a way of life, and culture as sets of collective memories – that is, "the aspect of culture that consists of shared ideas and beliefs of history, ancestry and of life sustained in a community of individuals' memory, lived, signified, expressed and enacted, which gives heritage and cultural practices their meaning" (Chow 2014, 613–614).

However, as much as all these understandings of the meaning of culture are important for the overall understanding of the general concept of culture, it may be argued that the crucial one for the purposes of this paper is the understanding of culture as a way of life. Its relevance in defining the concept of culture may be deduced from its being the common denominator between the two previously shown categorizations of the aspects of culture (Stavenhagen's and Chow's). As has been mentioned, this is the understanding of culture which sees it as a way of distinguishing groups among each other; at the same time, it may be said that culture as a way of life "is central to an expression of the identity of an individual or a community" (Ssenyonjo 2016, 627), which makes this definition the most relevant for the topic at hand.

2.2 The General Concept of Cultural Rights

The concept of cultural rights is one often mentioned in public discourse, yet also often overlooked when it comes to the practical work done in the service of the overall human rights protection. Generally speaking, cultural rights are classified as second generation rights, along with economic and social rights. Still, more often than not, economic and social rights get way more attention than cultural rights do.

The meaning of human rights is not an objective fact – rather, their meaning stems from certain social norms and understandings, typical for the time and place at which the rights are considered and/or provided. This comes from the fact that "[a]ll legal rights are social constructs, the product of social struggle" (Woods 2005, 128) – therefore, their content depends on the interpretation of relevant actors, which makes understanding them in a definite way nigh impossible.

Nevertheless, a general understanding of their nature can be achieved, which will be sufficient for the evaluation of the topic at hand.

Following the already mentioned fact that human rights are social constructs, it is evident that different human rights are related to each other, and not existent as separate entities. This is especially true for cultural rights, whose scope is often difficult to define in a way precise enough to deal only with the legal rights concerning culture (and not with other aspects of culture in general), yet broad enough to encompass all the ways in which legislation (domestic or international) provides people with protection for their cultural lives. In order to do so, it is necessary to recognize that "cultural rights are closely related to other individual rights and fundamental freedoms such as the freedom of expression, freedom of religion and belief, freedom of association, and the right to education" (Stavenhagen 2001, 85).

Seeing as, compared to other human rights of the first and second generation, cultural rights are often overlooked or not examined in enough detail, it comes as no surprise that there is often a lack of consensus on their content, as well as their enforceability and obligatory nature. They are often considered a controversial area (Smith 2007, 30), while their judicial enforcement is said to be "an inherently flawed and inadequate enterprise" (Woods 2005, 128).

When it comes to the examination of the general concept of cultural rights, the most important issue to be raised is that of the subjects whom they protect. In effect, a question can be posed

"whether the concept of cultural rights can be adequately encompassed by a notion of universal individual rights, or whether they should be complemented by a different approach: that of collective or communitarian rights [...] [since] some of these rights can only be enjoyed by individuals in community with others and such a community must have the possibility to preserve, protect and develop its common culture" (Stavenhagen 2001, 92).

The issue raised here once again calls attention to the rift between singularism and pluralism in the approach to defining culture. The notion of universal individual rights is mostly suited to the concept of culture as a singular phenomenon, common to all people; on the other hand, defining cultural rights as collective or communitarian rights keeps in line with the pluralist understanding of culture as pertaining to a specific group of people.

2.3. Specific Cultural Rights

Having provided a framework for defining the concepts of culture and cultural rights in their general sense, attention is now redirected to the examination of different specific cultural rights. The starting point for this is found in the International Covenant on Economic, Social and Cultural Rights (ICESCR 1966), as the most widely recognized and most thorough legal source on protection of cultural rights in the international legal system. However, the scope of the paper in this regard surpasses the norms of the ICESCR, taking into account other relevant sources of international law in this area, as well as the academic works concerning this topic. Thus, a catalogue of specific cultural rights is devised for the purposes of the paper, comprised of the following rights: right to education, right to take part in cultural life, right to enjoy the benefits of scientific progress and its applications, right to culture, protection of cultural heritage and language (linguistic) rights.

The first cultural right provided for by the ICESCR, and one of the most developed specific cultural rights on the whole, is the right to education (art. 13–14). It is "entrenched as a fundamental human right at international, regional and national levels [...] [and] has become increasingly central to the broader human rights framework as a widely recognized 'empowerment' right" (Veriava, Paterson 2020, 113). The relevance of this right is also confirmed through the General Comment No. 13 of the UN Committee for Economic, Social and Cultural Rights (CESCR), which elaborates further on its content (CESCR 1999). The high level of development of this right is largely due to the fact that it is not solely related to culture and cultural rights – on the contrary, its relevance is also reflected in its role in the provision of necessary conditions for the future realization of other human rights, such as economic and social rights (e.g. through gaining the necessary education for future employment), which gives them an added importance in the eyes of the relevant actors working on their development and protection.

Other than the right to education, the ICESCR also provides for the right to take part in cultural life (art. 15.1.b). Once again, the CESCR produced a General Comment on the right, providing a more thorough examination of its components and overall meaning (CESCR 2009). Thus, three aspects of the right are recognized – participation

in, access to and contribution to cultural life. Such an operationalization provides the subjects of this right with a range of degrees of interaction with cultural life – a person may simply consume the contents of cultural life (access it), share the experience with other subjects (participate in it), or create new content to become part of it (contribute to it). Through its examination, at the same time, it is possible to observe the evolution of the right through time – for comparison's sake, the Universal Declaration of Human Rights (UDHR) only guaranteed the right "to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits" (UDHR 1948, art. 27.1), which is much less than the current level of development of this right.

Alongside these, a guarantee is provided by the ICESCR for the right to enjoy the benefits of scientific progress and its applications (art. 15.1.c), which can be further defined as being comprised of four elements: access to the benefits of science; contribution to science; participation in decision-making concerning science; and conservation, development and diffusion of science and culture (Ssenyonjo 2016, 637). As will be further elaborated in the following parts of the paper, when it comes to the topic discussed, the most relevant aspects out of the mentioned four are the access to the benefits of science and the participation in decision-making concerning science.

However, not all cultural rights are mentioned in the highest instruments of international law, such as those previously mentioned. Still, that does not make them any less worthy of the label of cultural rights – only less protected in a judicial sense. These rights are most often examined in theoretical and academic works, as well as used in political discussions, with the aim of eventually providing them with a certain degree of protection, as is the case with the ones guaranteed by international legal instruments. The first one of those to be contemplated here is the right to culture.

At a first glance, it may seem difficult to differentiate between this right and the right to take part in cultural life; nevertheless, the application of the previously outlined theoretical framework provides an explanation of the demarcation between the two. The crux of the matter, once again, lies in the difference between exclusively adopting singularism in the definition of culture, on the one hand, and recognizing both singularism and pluralism in this regard, on the other. Thus, if the notion of a "universal" culture is the only one accepted, the two

mentioned rights may be equated; yet should a distinction between a "universal" culture and the culture of a specific group be made, the two rights wind up having greatly different meanings.

The second, broader interpretation of the issue is the one adopted in this paper. Therefore, the right to culture is regarded as a strictly pluralistic projection of the otherwise mostly universalist right to take part in cultural life. The right to a culture of their own is thus bestowed upon specific groups whose binding characteristics provide a sufficient basis for the development of a particular culture. In this case, the content of the right to culture is "the respect for the cultural values of groups and individuals by others who may not share these values; [...] [that is,] the right to be different" (Stavenhagen 2001, 93).

Protection of cultural heritage – both tangible and intangible – may be considered an aspect of this right to culture. The essential objective of this protection is not the preservation of the heritage for the sake of protecting it, but rather the protection of the importance and meaning it has for the group whose culture it belongs to. This is reflected in the belief that that "for tangible and intangible cultural heritage to have meaning and potency, the heritage must be active, dynamic, used, and performed, rather than existing inert and static" (Silverman, Ruggles 2007, 12). Cultural heritage as such is often perceived as pertaining to particular cultures; nevertheless, there are certain aspects of it which may be regarded as belonging to the universal concept of culture.[1] Thus, the two conceptions of culture are connected through this right, making it contentful no matter which definition of culture is adopted.

Related to the right to culture is the concept of language rights (Pupavac 2012, 24) as well, which are sometimes considered an aspect of this broader right to culture, and sometimes considered an entirely separate cultural right. The perception of them as an aspect of the broader right to culture is derived from the understanding of languages as part of intangible culture, and thus a form of cultural heritage (Silverman, Ruggles 2007, 3). Still, they are recognized as separate rights by certain international legal instruments – the International Covenant on Civil and Political Rights (ICCPR) proclaims the right of linguistic

---

[1] This is often the case when it comes to cultural products created by cultures not existent anymore – e.g. the architectural achievements of Ancient Romans are nowadays perceived as belonging to the humanity as a whole, and not only to, for example, Italians as the "heirs" to the Ancient Roman culture.

minorities to use their own language (ICCPR 1966, art. 27). Accordingly, they are examined here as cultural rights on their own as well. Language rights – or, as they are often labeled, linguistic rights[2] – are founded on their relation "to the mother tongue(s) [...] consisting of the right to identify with it/them, and to education and public services through the medium of it/them" (Skutnabb-Kangas, Phillipson 1995, 71). Once again, their core is to be found in the pluralist understanding of culture, due to the fact that "language is not something enjoyed alone, but in community with others" (Pupavac 2012, 28), making it a part of the group's heritage. Thus, their protection is undeniably tied to the recognition of a group as a cultural unit, with a language specific to it, which would be offered protection through these rights.

The focal point of linguistic rights is found in the mother tongue; however, the definition of this concept may vary, which causes differing interpretations of the rights themselves. Theoretically speaking, it is possible to recognize four major approaches to the determination of a person's mother tongue – the language they first learned, the language with which they identify, the language they know the best, and the one they use the most (Skutnabb-Kangas, Phillipson 2023, 4). Depending on the criterion of definition chosen, it may happen that a person has a mother tongue they don't know (fully or at all) (Skutnabb-Kangas, Phillipson 2023, 6), which makes the protection of these rights even more complex and logistically difficult to achieve.

Seeing as linguistic rights are grounded in the group whose language they offer protection to, in practice, they are of highest importance to minority languages – when a language is spoken by a dominant group in a society, there is not as much to protect it from, making the rights less vital to enforce. The effect of the protection offered by linguistic rights is visible from the treatment the language gets – when it comes to minority languages, the approach to them is always somewhere on the "promotion continuum", going from prohibition to promotion of the language (Skutnabb-Kangas, Phillipson 1995, 79).

The relevance of the protection of linguistic rights stems from the understanding of languages as "valuable expressions of identity and culture that are linked with particular peoples" (Nic Craith 2010, 45). In

---

[2] Both "language rights" and "linguistic rights" are often encountered in literature, with little to no apparent difference between the two being visible most of the time. For the purposes of this paper, the two are considered coterminous, and are used interchangeably.

line with this, these rights are considered a part of identity recognition and protection (Pupavac 2012, 28), and much attention in academic works is devoted to the ways in which they are endangered, including linguicism (as analogous to racism or ethnicism) (Skutnabb-Kangas, Phillipson 1995, 105–106), linguistic imperialism (Pupavac 2012, 120–43), and even a claim that the lack of protection for linguistic rights is genocidal (Skutnabb-Kangas, Phillipson 2023, 12–13).

3. THE DIFFERENCES BETWEEN DEAF, DEAF (CAPITALIZED) AND HARD-OF-HEARING

When it comes to people whose identity in this case is defined through their different-than-ordinary situation concerning hearing, three different labels may be recognized – deaf, Deaf (with a capital letter) and hard-of-hearing. In certain cases, two labels may simultaneously be suitable for the same person, due to their differing definitions. Since the identification of a person with any one of these has specific effects on the cultural rights they have, it is necessary to clarify the distinction between the three. In order to do so, the following section focuses on two separate models of perception concerning this question.

The foundation for the differing labels lies in a set of two parallel outlooks being applied to the topic. On the one hand, the medical model recognizes two of these labels – deaf and hard-of-hearing. It is often referred to as the social model, and may be concisely defined as an audiology-based classification. On the other hand, the core of the culturo-linguistic model is removed from the medical context, and this approach is concerned with the label "Deaf".

The medical approach is grounded in the concept of deafness, "commonly understood as the partial or total absence of the faculty of hearing" (Ladd 2003, 32). The focus is placed on the biological aspect of an individual's experience – that is, the lack of functionality of the sense of hearing. The World Health Organization [WTO] recognizes four levels of hearing loss – mild, moderate, severe and profound, and these levels present the criteria for the demarcation of the deaf and hard-of-hearing labels. According to the World Health Organization (WHO), a person is considered hard-of-hearing if they have mild to severe hearing loss; if the hearing loss is profound, the person is considered deaf (WHO, 2023).

On the other hand, the culturo-linguistic approach is concerned with only one label, and that is Deafness. It has to do with much more than the level of hearing of a person, instead being connected to the experiences lived by the individual. The approach is often described along the lines of being "a Deaf counter-narrative, established [...] to counterbalance the medical and social welfare narratives which have served to 'explain' those communities to others for so many centuries" (Ladd 2003, 26), which makes it slightly more difficult to define, due to its somewhat fluid nature.

The concept of being "culturally Deaf" is sometimes described as relating to "those who grow up with 'severe' deafness as their everyday childhood reality [...] [whose] closest friends are other Deaf children, with whom they communicate in sign language [...] [who, o]n leaving school, [...] seek out local, regional, national and international groups of Deaf people, and thus become fully enculturated into Deaf communities" (Ladd 2003, 33). Such a definition provides a wide array of elements for understanding the concept; however, in practice, not all of them need be present in an individual's experience in order for them to identify as Deaf. Therein lies a certain ambiguity of the label – the absence of measurable, clear-cut criteria produces gray areas, where individuals may not obviously be part of the Deaf community, yet may show some characteristics bringing them close to the concept of Deaf culture.[3]

At its core, the concept of Deafness may be seen as a form of retaliation against being described by the hearing community as "lacking" and "less," instead identifying as simply "different." This distinction is grounded in the revolt against hearing being the standard of quality life and potential. The members of the Deaf culture often "do not view themselves as having a disability or being members of the disability community [rather perceiving] themselves as belonging to a linguistic community, full of cultural solutions" (Gertz, Boudreault 2016, 162).

As can be seen, the concept of a linguistic community is a very important one when it comes to the cultural identity of the Deaf – in effect, it may be said that "the use of and fluency in a signed language—more than the degree of sensory difference or the use of

---

[3] Actually, the contemporary Deaf discourse "denies that degree of hearing impairment has relevance for cultural membership" (Ladd 2003, 35); thus, a person may be medically hearing, and yet culturally Deaf – e.g. a hearing child born to Deaf parents, whose primary language is a sign language, and who was brought up in the Deaf culture.

speech as a communication technology—accounts for that defining misalignment of Deaf identity and deafness" (Harmon 2010, 34). The role of this defining element of Deafness in the understanding of the cultural rights of the members of the group is essential, especially when it comes to the cultural rights whose content depends on the pluralistic conception of culture.

When comparing the two previously outlined models, it may be pointed out that the notions of deaf and hard-of-hearing are basically defined as "hearing people who have lost some of their hearing" where "the fundamental reality is one of loss" (Ladd 2003, 33). On the other hand, the concept of Deafness is an antipode to the notion of hearing loss – it is concerned with the so-called Deaf gain, which is "a term given to the idea that the unique sensory orientation of deaf people leads to a sophisticated form of visuospatial language and visual ways of being" (Gertz, Boudreault 2016, 187). Therefore, it is the process of "reframing deafness, not as a lack, but as a form of human diversity capable of making vital contributions to the greater good of society" (Bauman, Murray 2010, 210).

In a way, being deaf may be understood in the context of

"people who were born hearing but whose daily reality is now one of forever being condemned to live on the margins of existence, where, to adapt an old advertisement, "the edge of a conversation is the loneliest place in the world"; who have to cling to the coat-tails of the hearing world and numbly accept being reduced to imbecilic status in the eyes of the media, by cartoonists and comedians [...] [while being Deaf may be seen] as a national and international community of people with their own beautiful languages, their own organisations, history, arts and humour, their own lifelong friends whom otherwise [...] [they] would not have met" (Ladd 2003, 37).

To put it shortly, the difference between the two perspectives may be described as the difference between "the notion of audiological deafness, an audiological condition that implies no choice and no learning per se, and cultural Deafness, which implies choice and learning" (Gertz, Boudreault 2016, 286–87). When it comes to the deaf and hard-of-hearing, there is no cultural group to be recognized – therefore, the only cultural rights relevant would be the ones which regard culture as a singular, universal phenomenon. On the other hand, though, the Deaf label encompasses the concept of a cultural community, mak-

ing it suitable for the pluralistic conception of culture, and thus providing a basis for a wider array of cultural rights to be protected.

When it comes to these specific cultural rights, a claim may be encountered that "although human rights protection regimes are enacted for certain cultures, the measures do not encompass groups that are non-dominant and territorially dispersed" (Shikova, Colomina Limonero 2023, 172). While such an opinion may seem overly strong – the non-dominant and territorially dispersed groups are not absolutely deprived of the protection for their cultural rights – it does point out an issue these groups are faced with, which is a lower level of protection bestowed upon their rights.

Taking into account the peculiarities of the Deaf culture, as well as the ways in which the Deaf discourse defines this cultural group and its core elements, it may be concluded that linguistic rights are the most important ones to be protected when it comes to this group. However, the obstacles for this are manifold. Apart from the already mentioned territorial dispersion and non-dominant status of the group in question (the Deaf community), an issue also arises from the lack of understanding that sign languages are languages in their own right.

Sign languages are often seen as purely interpretative mechanisms applied to the existing, spoken languages, despite it not being true. While their protection is enshrined in the Convention on the Rights of Persons with Disabilities (CRPD 2007) – through the recognition of the specific cultural and linguistic identity of persons with disabilities (art. 30.4), recognizing and promoting the use of sign languages (art. 21.1), and facilitating the learning of sign language and the promotion of the linguistic identity of the deaf [*sic*] community (art. 24.3) – in practice, this is not done to a satisfactory degree. Taken altogether, the aforementioned factors make the protection of cultural rights of the Deaf much more difficult and less effective.

4. DIGITAL TECHNOLOGIES AFFECTING THE CULTURAL RIGHTS OF D/DEAF AND HARD-OF-HEARING PEOPLE

The impact of digital technologies and their expansion can be felt in a vast number of areas of life of a person, be they d/Deaf or hard-of-hearing, or not. Such is the case with the cultural rights of d/Deaf and hard-of-hearing persons as well, which is the focus of this

paper. In order to best address the issue at hand, the following section shall first address the types of different digital technologies relevant to the topic, and then provide an analysis of their impact on the cultural rights of d/Deaf and hard-of-hearing people.

4.1. Types of Relevant Digital Technologies

The variety of digital technologies relevant for this topic is considerable; however, only the most impactful and widespread ones are examined in the following section. Among the referenced technologies, two broader categories may be recognized – assistive technologies, and ordinary-use technologies which still impact the cultural rights of the d/Deaf and hard-of-hearing people. Their analysis is approached accordingly, with attention first being given to one, and then the other category.

Assistive technologies are created with the purpose of helping a person overcome the limitations placed upon them due to a form of reduced ability, or disability, they have. These technologies can be developed in the form of physical products (when it comes to the d/Deaf and hard-of-hearing, an example for these would be hearing aids or cochlear implants) or digital products (e.g. software and apps that support interpersonal communication) (WHO, 2022). Obviously, the physical products have a longer history of usage; nevertheless, the corpus of digital products available for these purposes is rapidly growing, making it equally suitable for analysis. At the same time, it is necessary to point out that, despite their division into physical and digital ones, all the products discussed here rely on digital technologies in order to function, at least in their contemporary versions.

The oldest form of assistive technologies for the d/Deaf and hard-of-hearing are hearing aids (Valentinuzzi 2020). Their structure and functions have evolved through the time; nevertheless, substantially they remain devices which are inserted into the ear in a non-invasive way, with the aim of helping a person who has a certain level of hearing left gain more information from the existing sound stimuli from their environment. Contemporary hearing aids – as opposed to those from the predigital era, when they were little more than amplifiers – combine amplification with "advanced forms of signal processing for speech enhancement, noise reduction, self-adapting directional inputs, feedback cancellation, data monitoring, and acoustic scene analysis, as

well as the means for a wireless link with other communication systems" (Levitt 2007, 7). Thus, they provide the user with significant help in processing sounds around them.

Another form of a physical product devised as an assistive technology for the d/Deaf and hard-of-hearing are cochlear implants. Similarly to hearing aids, cochlear implants are also equipped with digital technology – still, in order to use them, a person must undergo a surgical intervention which places a part of the device inside the skull, making this a much more invasive form of assistive technology. Due to the serious nature of the procedure, their use is reserved for those with profound hearing loss – that is, for cases in which hearing aids are incapable of causing improvement. At the same time, even though cochlear implants can be used in cases of adult deafness, most cases – and most attention in the narratives concerning this type of assistive technology – are of children, especially very young ones, receiving this kind of treatment.

When it comes to the digital products of assistive technologies, a greater variety may be recognized. Their proliferation and development is constant and rapid, providing a huge body of possible objects of analysis; nevertheless, attention will be devoted to three main categories of such technologies – closed captioning, speech recognition and live captioning, and sign language generation and interpretation software.

Closed captioning is mainly understood as pertaining to pre-existent content, and it is used as a means of making its audio elements accessible to d/Deaf and hard-of-hearing people. Although similar to the process of subtitling, this process requires special training (as compared to the interlingual subtitling for the hearing) (Neves 2008, 135), since there is an additional need for "descriptions of sound effects, background noises and other vital information which may be required for Deaf [...] [people] to fully comprehend the content of the [...] materials" (Ohene-Djan, Shipsey 2006, 1). In comparison, subtitling is a process which consists of translating the content from one language to another, and it conveys only the spoken information (United Nations 2022, 41), omitting other audio content. An overlap between the two may be recognized in subtitles for the d/Deaf and hard-of hearing – these are used when content is translated (which is the subtitling aspect of the process), as well as enriched through the inclusion of other, non-spoken audio content in its creation (the closed captioning aspect of the process) (United Nations 2022, 41).

When it comes to closed captioning, the aim is to make as much audio content accessible to the viewer as can be done. However, it is very difficult (if not absolutely impossible) to convey the full message originally transmitted orally, through a written medium. The words may be transcribed; yet the intonation, speed of speech, emotions etc. cannot be fully translated to the written word. There have been some ideas for including the emotional aspect of the words spoken by characters through the usage of different colors, fonts etc. (Ohene-Djan, Shipsey 2006), still, even if this were to be included in all cases, a risk of overcrowding the script would be present, reducing its reliability and usefulness.

The danger of overcrowding the script is even more of an issue when its users are Deaf. In this case, their mother tongue is a sign language – therefore, the script is given in a language that is second to them, which makes it more difficult to follow (Neves 2008, 131). At the same time, generally speaking, the Deaf often read slower – research suggests that they may find information "more accessible when it is provided in a video format with sign language, rather than in a text format" (United Nations 2022, 23). Obviously, this makes subtitles more difficult to follow as well (Neves 2009, 159–60).

A lack of these technologies lies in their primary use for pre-made content; that is, their lack of applicability in real-time situations. In order to provide accessibility to d/Deaf and hard-of-hearing people in these contexts as well, other technologies are used, such as speech recognition systems and live captioning. Automated systems may be used to this effect, but it is not the only option – live captioners may be human too; however, professionals in this field are rare, and their services are quite expensive, making this approach less accessible (Kawas et al. 2016, 1).

When it comes to using automatic speech recognition software for communication between hearing and d/Deaf or hard-of-hearing people, research suggests that it is a system faster than typing messages (Stinson et al. 2017). Such a claim may be understood as justification for the development of some software in this area – for example, a French company created an application which uses speech-to-text algorithms in order to make phone calls accessible to d/Deaf and hard-of-hearing people. Apparently, systems like these can have an up to

93% accuracy result, with the possibility of it getting higher with the slowing down of dictation (Lyall, Clamp, Hajioff 2016, 106); still, this is not always true, and "errors in live-captioning tools, while they might seem acceptable to hearing individuals, can exclude deaf users depending on it to follow a conversation" (Touzet 2023, 29).

A more elaborate idea, whose foundation is in these technologies, is the development of an augmented reality in conjunction with an automatic speech recognition (or audio-visual speech recognition) system to help in communication, by making "speech bubbles" appear next to the speaker on a video stream, so that the user experiences communication in a way similar to a comic book (Mirzaei, Ghorshi, Mortazavi 2012). The potential of such a solution is undeniable; yet it must be emphasized that such ideas are only in their development stages, and much more work has to be done in order of them to be reliable enough to be widely used.

Finally, there has been mention of ways to develop sign language generation and interpretation software in the interface of computing systems, with the aim of making access to them easier (Huenerfauth, Hanson 2009). The idea for the creation of such tools has great merit; nevertheless, its development can be rather demanding, both in terms of financial resources and time needed to be devoted to the process. At the same time, relevant stakeholders may not always be motivated enough to invest in such endeavors. Consequentially, the level of development of these technologies is quite low, and the attention devoted to the improvement of this situation quite little.

In the end, technologies which are not assistive in nature, yet have some impact on the cultural rights of the d/Deaf and hard-of-hearing people, should be mentioned. Ordinary subtitling may be considered a part of this category – though it is not as effective as some of the assistive technologies discussed above, in the absence of anything better, a subtitle can provide some help to d/Deaf and hard-of-hearing people when it comes to accessing audio content. Incidental benefits for these individuals may come from video conferencing software as well – although sign communication taking place in digital space is different from the "live" version (Keating, Edwards, Mirus 2008), it still makes communication from afar possible, which is an improvement compared to the times where live communication could only be achieved in audio form.

4.2. The Effect of the Examined Digital Technologies on the Cultural Rights of d/Deaf and Hard-of-Hearing People

When it comes to the cultural rights of d/Deaf and hard-of hearing people, the effects these technologies have on them are quite diverse. Some cultural rights seem to mostly benefit from the majority of technologies shown; on the other hand, in certain cases, the situation is much less clear. The following section provides an overview of the effects recognized in the fields of all previously defined cultural rights of d/Deaf and hard-of-hearing people.

The results of introducing the examined digital technologies into the lives of d/Deaf and hard-of-hearing people in regards to the status of their cultural rights are most controversial in the cases of the right to culture and the protection of cultural heritage. As is guaranteed by the CESCR, everyone has "the right to choose one's own identity, identify or not with one or more communities, or to change that choice" (CESCR 2009, para. 15a). Consequently, the Deaf community, as the proprietary of Deaf culture and, thus, the subject of the right to culture tied to it, often raises the argument of a number of these technologies being an attempt to force hearing culture upon them, and thus suppress their own cultural identity.

This is especially visible when it comes to the physical assistive technologies discussed above (hearing aids and cochlear implant. In fact, "[w]hile some, especially post-lingually deaf people may embrace the technology, those who see themselves as a cultural or linguistic minority and refuse to see their worlds as tragically silent have reauthored biomedical narratives in a way that depicts a colonial force" (Roulstone 2016, 23–24). Due to their invasiveness, cochlear implants tend to be even more susceptible to such aversion than hearing aids are (Sparrow 2010).

The distinction, as can be seen, stems from the difference between deaf/hard-of-hearing and Deaf people. It may be said that "those coming from a medical standpoint [...] see cochlear implants as a "cure" for deafness, and those who came from a Deaf perspective [...] view cochlear implants as a violation of [...] [a person's] right to be Deaf" (Archbold, Wheeler 2010, 227). Therefore, when it comes to the protection of the cultural rights of deaf and hard-of-hearing people, these technologies are often seen as beneficial – they may make it easier for their users to access culture, get an education etc. However,

when regarded from the perspective of protecting the cultural rights of the Deaf, they are considered a threat to their particular cultural rights.

The complaints shown above are most often raised by Deaf parents of a child who is a potential user of such technologies. A question may be raised, though, if the usage of these technologies can really endanger an individual's right to culture – that is, their right to be Deaf. As has been mentioned before, the cultural concept of Deafness is not necessarily tied to the medical notion of deafness; therefore, it may be pointed out that

> "The majority of models and discussion of the makeup of the Deaf community seem to accept the inevitability that hearing people will be members of the community—up to a point. The focus in this context is often on those hearing people that have Deaf parents or siblings and have therefore grown up in the Deaf community, acquired sign language from an early age, and become enculturated to the Deaf way of life" (Napier 2002, 142).

Therefore, a child can be Deaf even if, through the use of technologies such as these, they are not deaf or hard-of-hearing. In this case, the impact of technologies is such that it only gives the child the possibility to "benefit from the cultural heritage and the creation of other individuals and communities", which is determined to be part of the right to take part in cultural life (CESCR 2009, para. 15b).

The technologies discussed here could be perceived as endangering the right to protection of cultural heritage. It may be said that this and the right to culture are very closely tied – however, while the right to culture may be understood as an individual, as well as a communal right, the protection of cultural heritage is fundamentally focused on the social unit as its subject. Through the application of technologies which provide persons who would otherwise be exclusively Deaf when it comes to the cultural divide between Deaf and hearing worlds with means to become a part of the hearing culture as well, the incentive for participation in Deaf culture for these individuals grows weaker. With the passage of time, this can bring about a considerable reduction in the size of the Deaf community (Sparrow 2010, 3–4), thus endangering the Deaf culture as a part of cultural heritage.

An argument could be raised that, in individual cases, the benefits a person (in most cases concerning e.g. cochlear implants, a child) receives from the application of relevant digital technologies should

take primate over the interests of the communal good of cultural heritage. Such a claim could be defended through the principle of acting "in the best interests of the child", which is enshrined in the Convention on the Rights of the Child (1989, art. 3.1). Still, such arguments often ride the fine line between true protection of human rights, and outright cultural imperialism. Therefore, it comes as no surprise that the debate between the two cannot be clearly resolved.

Arguments similar to those concerning physical assistive technologies may be applied to a number of other technologies considered in this paper. Closed captioning, speech recognition softwares, live captioning and ordinary subtitling all have the same issue of forcing hearing culture upon a d/Deaf or hard-of-hearing person, instead of providing a way for the relevant content to be transposed into a form compatible with their own cultural experiences. On the other hand, this issue is avoided in cases of sign language generation and interpretation software, as well as video conferencing systems – these are considered truly beneficial for the right to culture of the d/Deaf and hard-of-hearing people.

Closely related to the topics of the right to culture and the protection of cultural heritage is the issue of linguistic rights, so it comes as no surprise that the arguments pertaining to these questions have a great deal of overlap. The same set of technologies seen as negative when it comes to the right to culture and the protection of cultural heritage, is considered to have a negative effect on the linguistic rights, due to them negatively impacting the incentive for learning sign languages, which are considered mother tongues of Deaf individuals. On the other hand, the technologies whose objective is not replacing sign languages, but rather providing them with a means of more efficient transmission and application – such as sign language generation and interpretation software, as well as video conferencing systems – are considered beneficial to the state of protection of these rights.

The impact of discussed digital technologies is visible in the area of the right to take part in cultural life as well. In this regard, the effects are mostly positive, and can be observed both when it comes to the question of media content, where closed captioning and ordinary subtitling provide a way for d/Deaf and hard-of-hearing individuals to access it, and in the field of live communication, where technologies such as speech recognition software and live captioning act as a tool for communicating with hearing individuals. Improvement is noted in

both these contexts when it comes to hearing aids and cochlear implants as well, while sign language generation and interpretation software, as well as video conferencing systems, have a somewhat limited scope of impact when it comes to the participation of d/Deaf and hard-of-hearing individuals in the universal cultural life, seeing as their function is primarily confined to the inside of the Deaf community.

Concerning the right to education, it may be said that many of the mentioned technologies have the potential of improving the accessibility of education in general. This is true for the physical products of assistive technologies – hearing aids and cochlear implants – but also for other tools. Closed captioning and ordinary subtitling provide d/Deaf and hard-of-hearing students with a way to use otherwise inaccessible teaching materials, such as audio recordings, videos with relevant sound content, and the likes. On the other hand, speech recognition software and live captioning facilitate communication with hearing instructors, as well as make it possible for d/Deaf and hard-of-hearing students to participate in interactive work during classes, along with their hearing peers.

However, it must be emphasized that the right to education is not confined to its aspect of accessibility. Rather, when it comes to the topic at hand, it is necessary to mention the elements of acceptability of education (which means, *inter alia,* that it is culturally appropriate to students), as well as its adaptability (*inter alia,* to the "needs of changing societies and communities [...] and the needs of students within their diverse social and cultural settings" (CESCR 1999, para. 6). Taking these into account, it may be claimed that shortcomings are recognizable in all the technologies previously criticized for infringing on the right to culture, protection of cultural heritage and/or linguistic rights of d/Deaf and hard-of-hearing people.

Finally, when it comes to the right to enjoy the benefits of scientific progress and its applications, as has been mentioned in the theoretical framework of the paper, the two most relevant aspects to be considered are the right to access to results of scientific progress, and the right to participation in decision-making concerning it. Evidently, the rise of the number and diversity of digital technologies which can be used by d/Deaf and hard-of-hearing can be taken for a positive effect on the right to access to scientific progress. On the other hand, when it comes to the right to participation in the decision-making process concerning scientific progress, the basis for its protection can be

found in the soft law of the Declaration on the Rights of Persons Belonging to National or Ethnic, Religious and Linguistic Minorities, in the provision saying that "[p]ersons belonging to minorities have the right to participate effectively in decisions on the national and, where appropriate, regional level concerning the minority to which they belong or the regions in which they live, in a manner not incompatible with national legislation" (1992, art. 2.3). Basically, in order for more useful and accessible technology to be made, its potential users must have a say in the process, providing the needed guidance for and pressure on the relevant stakeholders. An elaboration of this is provided in the following section.

5. STRATEGIES FOR IMPROVEMENT

As has been shown in the previous part of the paper, the effect digital technologies have on the cultural rights of the d/Deaf and hard-of-hearing people are varied – there is much potential for them to be beneficial, yet they also produce a number of negative side effects. Moving forward, in order to maximize the benefits which digital technologies may provide in this regard, while neutralizing as many of their negative effects as possible, it is necessary to introduce some changes. Different approaches should be applied to different actors in the system; therefore, a specialized strategy must be devised for the Deaf community, the broader hearing community, the relevant stakeholders and the state actors.

When it comes to the Deaf community, it is necessary to give them more power in the process of decision-making concerning digital technologies developed for their needs. They must be given a voice to advocate for their own cultural interests, thus ensuring those are not overlooked for the sake of the interests of other involved actors. At the same time, when faced with unsuitable or insufficiently effective technological solutions, they must be encouraged to point out the shortcomings of the tools they are offered, so that the illusion of their absolute sufficiency can be dismantled.

When it comes to the broader hearing community, effort must be directed towards educating its members on the challenges d/Deaf and hard-of-hearing people face, as well as on the cultural particularities of the Deaf community. While some hearing people may be aware

of those, yet unwilling to act in accordance with the best interests of the d/Deaf and hard-of-hearing people, a significant portion of the hearing community simply does not know enough about the situation at hand. The importance of this lies not only in the way these hearing individuals will treat the d/Deaf and hard-of-hearing people they interact with, but also in the assistance they may give in exacting pressure on the relevant stakeholders when it comes to the protection of the interests of d/Deaf and hard-of-hearing people.

Education and informing efforts may prove to be helpful when it comes to the relevant stakeholders themselves as well. Presenting the benefits which could be achieved through the development of truly effective digital technologies, as well as a just application of those, may motivate the stakeholders to invest their resources and political power in making such goals a reality. Even though the effects might not be apparent in all cases, differences between the stakeholders may also prove to be beneficial – those who recognize the importance of this topic will gain an advantage in developing relevant technologies, thus becoming more competitive on the market. At the same time, their reputation will benefit from the status of being open to the interests of minority groups such as the d/Deaf and hard-of-hearing communities, providing them with further advantage in the eyes of their customers.

Finally, when it comes to the state actors, they need to be proactive in providing suitable protection to the cultural rights of the Deaf. This should be done through preemptive measures of preservation of the Deaf culture, in order to prevent its dying off due to a perceived "lack of need for it". Achieving this can be done in part through legislation; however, the engagement of state actors should go further than that, extending into the areas of public policy and general political involvement.

6. CONCLUSION

The presence of digital technologies is becoming all the more encompassing as time goes, and their effects are getting all the more pronounced in all areas of people's lives. The same holds true for the effects they have on the cultural rights of d/Deaf and hard-of-hearing people. Due to the wide scope of their interference in the daily lives of their users, as well as the diversity of their forms and objectives, it

comes as no surprise that the consequences of their usage can be both positive and negative, depending on the case.

The benefits provided by these technologies are highly visible in their impact on the right to education. The correct application of suitable digital technologies in this sense provides a way for d/Deaf and hard-of-hearing people to understand instruction, as well as gain access to various teaching materials. Similar effects may be recognized in the case of the right to take part in cultural life – through the application of these technologies, otherwise inaccessible cultural content is made suitable for these individuals to consume. Nevertheless, the situation is not without drawbacks.

First of all, the ways in which the majority of the examined digital technologies tackle the issues faced by the d/Deaf and hard-of-hearing people, focus on getting these individuals to participate in the hearing world, without taking into account their own cultural solutions to the challenges they face. Lack of ability to participate in the hearing world unaided is regarded as a shortcoming, and the digital technologies are seen as a tool for "fixing" this. Such an attitude overlooks the value Deaf culture has, and reduces it to an inferior way of life, one the members of this group presumably lead only out of a lack of choice, which is contradictory to the perception of Deaf culture its members actually have.

Another issue with the technological solutions discussed in this paper is their lack of satisfactory results. As has been pointed out, none of these technologies provide ideal results – however, hearing people may often be unaware of this fact. Therefore, seeing that the technologies mentioned are aiding d/Deaf and hard-of-hearing people, they may conclude there to be no need for further aid and support, even though the help provided by the technologies is not enough to put the d/Deaf and hard-of-hearing at an equal level of accessibility as the hearing people in the same situation. Consequently, even if the goal of the d/Deaf and hard-of-hearing people were to simply become integrated in the hearing world, disregarding their own cultural particularities, this would not be enough for such a result to be achieved.

Finally, the danger these technologies may pose to the Deaf culture as a communal good cannot be overlooked. Some of them are outwardly considered an affront to their cultural rights by the Deaf community – such as cochlear implants. On the other hand, even those technologies which the community regards as beneficial to them, may

prove to be detrimental to their cultural rights in the long run. Once again, the reason for this lies in the perception of the hearing people – seeing the ways in which these technologies increase accessibility for d/Deaf and hard-of-hearing people, they may come to the conclusion that Deaf culture and language "no longer necessary". Obviously, this would bring about a reduction in the protection offered to these cultural rights.

In the end, it may be concluded that, while digital technologies may be beneficial to the state of the cultural rights of d/Deaf and hard-of-hearing people, they may also be detrimental in certain cases. That is not to say that the technologies themselves are either good or bad; on the contrary, the responsibility for making sure their positive effects are maximized, and their negative effects made as small as possible, lies with those making decisions on how the technologies are used, and how the general public is informed about the results they can(not) provide. Future actions regarding this question have the power to minimize the recognized negative effects, while preserving and ameliorating the possible benefits; however, in order for this to be done, a number of diverse, relevant actors must put in a significant amount of effort. Whether this will happen in the proximate future or not, remains to be seen.

REFERENCE LIST

1. Archbold, Sue, Alexandra Wheeler. 2010. Cochlear Implants: Family and Young People's Perspectives. 226–40 in *The Oxford Handbook of Deaf Studies, Language, and Education*, edited by Marc Marschark and Patricia Elizabeth Spencer. Oxford Library of Psychology. Oxford: Oxford University Press.

2. Bauman, H.-Dirksen L., Joseph J. Murray. 2010. Deaf Studies in the 21st Century: 'Deaf-Gain' and the Future of Human Diversity. 210–35 in *The Oxford Handbook of Deaf Studies, Language, and Education*, edited by Marc Marschark and Patricia Elizabeth Spencer. Oxford Library of Psychology. Oxford: Oxford University Press.

3. Chow, Pok Yin Stephenson. 2014. Culture as Collective Memories: An Emerging Concept in International Law and Discourse on Cultural Rights. *Human Rights Law Review* 14 (4): 611–46.

4. Gertz, Genie, Patrick Boudreault, eds. 2016. *The Sage Deaf Studies Encyclopedia*. Los Angeles: SAGE reference.

5. Harmon, Kristen. 2010. Deaf Matters: Compulsory Hearing and Ability Trouble. 31–47 in *Deaf and Disability Studies: Interdisciplinary Perspectives*, edited by Susan Burch and Alison Kafer. Washington, DC: Gallaudet University Press.

6. Huenerfauth, Matt, Vicki L. Hanson. 2009. Sign Language in the Interface: Access for Deaf Signers. 1–18 in *The Universal Access Handbook*, edited by Constantine Stephanidis. Human Factors and Ergonomics. Boca Raton: CRC Press.

7. Kawas, Saba, George Karalis, Tzu Wen, Richard E. Ladner. 2016. Improving Real-Time Captioning Experiences for Deaf and Hard of Hearing Students. 15–23 in *Proceedings of the 18th International ACM SIGACCESS Conference on Computers and Accessibility*. Reno Nevada USA: ACM.

8. Keating, Elizabeth, Terra Edwards, Gene Mirus. 2008. Cybersign and New Proximities: Impacts of New Communication Technologies on Space and Language. *Journal of Pragmatics* 40 (6): 1067–81.

9. Ladd, Paddy. 2003. *Understanding Deaf Culture: In Search of Deafhood*. Clevedon, England; Buffalo: Multilingual Matters.

10. Levitt, Harry. 2007. A Historical Perspective on Digital Hearing Aids: How Digital Technology Has Changed Modern Hearing Aids. *Trends in Amplification* 11 (1): 7–24.

11. Lyall, Fiona, Philip Clamp, Daniel Hajioff. 2016. Smartphone Speech-to-Text Applications for Communication with Profoundly Deaf Patients. *The Journal of Laryngology & Otology* 130 (1): 104–6.

12. Mirzaei, Mohammad Reza, Seyed Ghorshi, Mohammad Mortazavi. 2012. Using Augmented Reality and Automatic Speech Recognition Techniques to Help Deaf and Hard of Hearing People. *Laval Virtual VRIC '12*.

13. Napier, Jemina. 2002. The D/Deaf – H/Hearing Debate. *Sign Language Studies* 2 (2): 141–49.

14. Neves, Josélia. 2008. 10 Fallacies about Subtitling for the d/Deaf and the Hard of Hearing. *The Journal of Specialized Translation*, no. 10: 128–43.

15. Neves, Josélia. 2009. Interlingual Subtitling for the Deaf and Hard-of-Hearing. 151–69 in *Audiovisual Translation: Language Transfer on Screen*, edited by Jorge Díaz-Cintas and Gunilla M. Anderman. Basingstoke [England] ; New York: Palgrave Macmillan.

16. Nic Craith, Máiréad. 2010. Linguistic Heritage and Language Rights in Europe: Theoretical Considerations and Practical Implications. 45–62 in *Cultural Diversity, Heritage and Human Rights: Intersections in Theory and Practice*, edited by Michele Langfield, William Stewart Logan, and Máiréad Nic Craith. Key Issues in Cultural Heritage. London; New York: Routledge.

17. Ohene-Djan, James, Rachel Shipsey. 2006. E-Subtitles: Emotional Subtitles as a Technology to Assist the Deaf and Hearing-Impaired When Learning from Television and Film.1–3 in *Proceedings of the Sixth International Conference on Advanced Learning Technologies*. Kerkrade, The Netherlands.

18. Pupavac, Vanessa. 2012. *Language Rights: From Free Speech to Linguistic Governance*. Palgrave Studies in Minority Languages and Communities. Basingstoke; New York: Palgrave Macmillan.

19. Roulstone, Alan. 2016. *Disability and Technology: An Interdisciplinary and International Approach*. London: Palgrave Macmillan.

20. Shikova, Natalija, Immaculada Colomina Limonero. 2023. Can Non-Territorial Autonomy Help to Enforce the Linguistic, Cultural and Educational Rights of the Roma. 171–94 in *Realising Linguistic, Cultural and Educational Rights Through Non-Territorial Autonomy*, edited by David J. Smith, Ivan Dodovski, and Flavia Ghencea. Cham: Springer Nature Switzerland.

21. Silverman, Helaine, D. Fairchild Ruggles. 2007. Cultural Heritage and Human Rights. 3–22 in *Cultural Heritage and Human Rights*, edited by Helaine Silverman and D. Fairchild Ruggles. New York, NY: Springer.

22. Skutnabb-Kangas, Tove, Robert Phillipson. 1995. Linguistic Human Rights, Past and Present. 71–110 in *Linguistic Human Rights: Overcoming Linguistic Discrimination*, edited by Tove Skutnabb-Kangas and Robert Phillipson. Berlin New York: Mouton de Gruyter.

23. Skutnabb-Kangas, Tove, Robert Phillipson. 2023. Introduction: Establishing Linguistic Human Rights. 1–22 in *Handbook of Linguistic Human Rights*, edited by Tove Skutnabb-Kangas and Robert Phillipson. Blackwell Handbooks in Linguistics. Hoboken, NJ: Wiley.

24. Smith, Rachel Craufurd. 2007. The UNESCO Convention on the Protection and Promotion of Cultural Expressions: Building a New World Information and Communication Order?. *International Journal of Communication* 1: 24–55.

25. Sparrow, Robert. 2010. Implants and Ethnocide: Learning from the Cochlear Implant Controversy. *Disability & Society* 25 (4): 455–66.

26. Ssenyonjo, Manisuli. 2016. *Economic, Social and Cultural Rights in International Law*. Oxford; Portland, Oregon: Hart Publishing.

27. Stavenhagen, Rodolfo. 2001. Cultural Rights: A Social Science Perspective. 85–110 in *Economic, Social, and Cultural Rights: A Textbook*, edited by Asbjørn Eide, Catarina Krause, and Allan Rosas. Dordrecht; Boston; London: Martinus Nijhoff Publishers.

28. Stinson, Michael, Syed Ahmed, Lisa Elliot, and Donna Easton. 2017. Using Automatic Speech Recognition to Facilitate Communication Between an Individual Who Is Hearing and One Who Is Deaf or Hard of Hearing.

407–8 in *Proceedings of the 19th International ACM SIGACCESS Conference on Computers and Accessibility*. Baltimore Maryland USA: ACM.

29. Stojković, Branimir. 1999. Identitet kao determinanta kulturnih prava. 9–97 in *Kulturna prava*, edited by Vojin Dimitrijević, Agneš Kartag-Odri, Branislav Milinković, Jan-Lui Serfontein, Ivana Simović-Hiber and Branimir Stojković. Beograd: Beogradski centar za ljudska prava.

30. Touzet, Chloe. 2023. Using AI to Support People with Disability in the Labour Market. *OECD Artificial Intelligence Papers*, no. 7.

31. UN General Assembly. 1948. Universal Declaration of Human Rights. *https://www.refworld.org/docid/3ae6b3712c.html* (last visited 31 January, 2024).

32. UN General Assembly. 1966. International Covenant on Economic, Social and Cultural Rights. *https://www.refworld.org/docid/3ae6b36c0.html* (last visited 31 January, 2024).

33. UN General Assembly. 1966. International Covenant on Civil and Political Rights, *https://www.refworld.org/docid/3ae6b3aa0.html.* (last visited 31 January, 2024).

34. UN General Assembly. 1989. Convention on the Rights of the Child. *https://www.refworld.org/docid/3ae6b38f0.html.* (last visited 31 January, 2024).

35. UN General Assembly. 2007. Convention on the Rights of Persons with Disabilities. *https://www.refworld.org/docid/45f973632.html.* (last visited 31 January, 2024).

36. UN General Assembly. 1992. Declaration on the Rights of Persons Belonging to National or Ethnic, Religious and Linguistic Minorities. *https://www.ohchr.org/en/instruments-mechanisms/instruments/declaration-rights-persons-belonging-national-or-ethnic.* (last visited 31 January, 2024).

37. UN Committee on Economic, Social and Cultural Rights. 1999. General Comment No. 13: The Right to Education (Art. 13 of the Covenant). *https://www.refworld.org/docid/4538838c22.html* (last visited 31 January, 2024).

38. UN Committee on Economic, Social and Cultural Rights. 2009. General Comment No. 21, Right of Everyone to Take Part in Cultural Life (Art. 15, Para. 1a of the Covenant on Economic, Social and Cultural Rights). *https://www.refworld.org/docid/4ed35bae2.html* (last visited 31 January, 2024).

39. Valentinuzzi, Max E. 2020. Hearing Aid History: From Ear Trumpets to Digital Technology. *IEEE Pulse* 11 (5): 33–36.

40. Veriava, Faranaaz, Kate Paterson. 2020. The Right to Education. 113–36 in *Research Handbook on Economic, Social and Cultural Rights as Human Rights*, edited by Jackie Dugard, Bruce Porter, Daniela Ikawa and Lilian Chenwi. Cheltenham, UK ; Northampton, MA, USA: Edward Elgar Publishing.

41. Woods, Jeanne M. 2005. Emerging Paradigms of Protection for 'Second-Generation' Human Rights. *Loyola Journal of Public Interest Law* 6: 103–28.

42. World Health Organization. 2022. Global Report on Assistive Technology. *https://iris.who.int/bitstream/handle/10665/354357/9789240049451-eng.pdf?sequence=1* (last visited 31 January, 2024).

43. World Health Organization. 2023. Deafness and Hearing Loss Factsheet. *https://www.who.int/news-room/fact-sheets/detail/deafness-and-hearing-loss* (last visited 31 January, 2024).