Handbook on the inclusion of persons with disabilities in non-formal adult education

IEDA

IEDA
INCLUSIVE EDUCATION:
Ensuring participation of
persons with disabilities
in non-formal adult education

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Initial thoughts

The IEDA project and this Handbook refer to persons with disabilities (PWDs) in the context of their Inclusive Education in Non-formal Adult Education. By addressing this ambition, the population of persons with disabilities inadvertently becomes a ‘trojan horse’ (in a positive sense) when it comes to reconsidering education and its role in modern society. For a simple reason: addressing this population and their access to educational environments reveals that education, considering its lifelong learning (LLL) strategy, needs serious reflection about whether a LLL strategy sufficiently equips individuals in today’s world with the skills they need to master their career and personal life. At the same time, by advocating that persons with disabilities need systematic and equal treatment in the educational process in line with the principles of inclusive education doctrine within lifelong learning, we unintentionally open a ‘Pandora’s box’, pointing out that addressing the educational issues in the light of lifelong learning — education that is inclusive of PWDs — automatically opens the discussion around the societal changes that are emerging in contemporary society. To deal with these ambitions holistically, the Handbook approaches these challenges through a double strategy. The first strategy in the introduction illuminates which wider societal appearances of the liquid society within modern societies correlate to efforts to make persons with disabilities an equal subject in educational discussions. The second strategy, divided into two issues, is more practical in nature. In part one, this strategy demonstrates various methodological and communicative aspects that need attention to support a population of persons with disabilities in entering an educational environment. The second strategy, in part two, highlights the importance of assistive technology (AT) and its more systematic use, which appears as usable in terms of supportive tools for the population of persons with disabilities as they follow their education journey.

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Role of lifelong learning in contemporary society

The introduction chapter reveals that individuals alive today face a very challenging time in history, where issues of education, identity, humanity and increased technology intertwine and have an impact on them. When it comes specifically to the role of lifelong learning (LLL), the latter, therefore, needs an interpretation also in the light of a person's identity and their search for meaning. Each modern individual, irrespective of whether that individual has a disability or not, is pushed into a more serious search for life-meaning because the traditional pillars in society, which in the past provided them with the foundations for constructing their own identity and searching for life-meaning, are no longer applicable. Therefore, the importance of LLL extends beyond the level of education for an individual (whether formal or informal) and does not simply assume that the modern individual must be competitive on a functional level and be able to operate in society and act in the spirit of modern times. Even more importantly, lifelong learning should also help an individual as an educational lever, with the help of which an individual can more easily construct their identity, which is being increasingly jeopardised by the ever-faster pace of life. For a modern individual today, it is no longer enough to create an identity during their youth that they then use as a basis for the rest of their life — the key is to build on their identity story throughout their life. The reason that an individual needs to give constant attention to the issue of their identity is a consequence of the fact that modern western society is becoming increasingly liquid.

Liquid modern society and its appearances

Individuals in today's world are faced with the transformation of modern western society into a 'liquid society' (Zygmunt Bauman 2002, Umberto Galimberti 2015, Umberto Eco 2018). This so-called liquid society is outwardly identifiable through many complex appearances and trends: weakening of cultural and religious traditions; inferiority of the national state as a result of globalisation; relativisation of professional identity; deflation of reality at the expense of virtuality (Jean Baudrillard 1999a); relativisation of the individual's adulthood in modern society; identity confusion within a field of the individual's physical body (Daniel Estulin 2014), reducing of the meaning of humanism's virtues on account of coming dataism (Yuval Noah Harari 2017). These appearances of liquid society are visible through the loosening of boundaries between different opposites, based on which society is becoming increasingly fluid, without the necessary identity anchors for the modern individual.

The loosening of boundaries between the national and global

Over the last few decades, individuals living in western society have found it challenging to fight against things at country level due to having freedom, democracy and human rights (normatively speaking) in principle. In addition, since World War II — except for the tragedy in former Yugoslavia in 1990-1995 and the current Ukrainian war — Western society has not faced external invaders on its soil. Trade and property conquest, which completely replaced war conquest in the Western world, has become a part of everyday life and did not and does not trigger a reason for rebellion in an individual. What is most important, therefore, is that the individual has not needed to fight for the ideals of freedom in recent decades. What's more, individuals living in the West today do not know what to do with freedom nowadays. Ule (2008) highlights this phenomenon, especially evident among young people, where individuals suffer from too much freedom.

Alongside the above obstacles to individuals fighting for their country, there is also the problem that it is increasingly difficult for the individual (especially young people) to positively identify with the state, not least for socio-economic reasons, which is visible through accelerated labour migration. This has more to do with a trigger on a deeper level because the state functions less and less as a sovereign entity for individuals, which is supposed to be a relevant subject in the political-economic globalisation game. This fact (more or less consciously) triggers an individual's reservation regarding respect for their home country. The curtailed sovereignty and reputation of the nation-state is the result of increasingly intensive processes of deregulation in Western society in the 1970s and 1980s, when the national economic and financial sub-systems became more deregulated. This weakened the power of nation-states at the expense of globalising market forces and processes (Kramberger 2010: 106-115). All these processes related to deregulation have been slowly but steadily weakening the nation-state and its sub-systems. Nation-states are therefore becoming less and less relevant and worthy of respect, let

alone trust, for their citizens on a symbolic level. By losing their sovereign essence, nation-states also lose their identifying charge and attraction for individuals as citizens. The domain of sport remains one of the few areas where individuals still strongly identify with their nation.

Since individuals no longer find an identity hinterland to such an extent in their country, they become susceptible to other forces that then replace this weakened role of the state. These are the beginnings of a kind of global-virtual identity framework, the fundamental characteristic of which is that it is triggered by the economic conglomerate led by operating multinationals, which goes hand in hand with an increasingly invasive technological age. Galimberti (2009: 17-19) accuses this global identity framework of uniformising individuals (especially young people), based on which an increasingly technologically uniformed society is emerging, embodied by a sort of technological rationality. Technologies, which give rhythm to this global identity trend and stage it externally, transform from the original communication tools into a goal in themselves.

Despite its growing influence, the global identity framework is empty of content and flattened. Therefore, it does not offer alternative societal identity frameworks that would successfully replace traditional frameworks and support the individual in identity building. Individuals assimilate and absorb all this global content (through devices), thereby artificially strengthening their fragile identity image. Bauman (2002: 107) describes this phenomenon as such that the individual buys their identities in identity supermarkets, where they can assemble and display their small identities as he pleases. The paradox of this identity shopping is grounded in media advertising, which, through emphasising individual freedom, worshipping difference and having one's own identity, sells mass-produced products to the individual, supposedly acting out this unique identity. Ule (2011: 92) summarises this literally: 'The life of an individual becomes a personal project or even better — a sequence of projects.'

The blurring of boundaries between adult and non-adult

It is surprising that, in addition to birth and death in the individual's life, it is challenging to extract another equally universal fact applicable to all of us. Education, marriage, family, children, love, friends, work, money and employment are issues that are not necessarily facts for everyone. An individual can have an education or not, be married or not, with or without children, live in various forms of communities or alone, insist on relationships for love, tradition, coercion, or other reasons, can earn money, be supported by others or have inherited money, can have acquaintances and friends or not. Therefore, adulthood, like birth and death, is the third phenomenon that an individual inevitably faces. The issue of (un)adulthood is the next indicator of liquid society and weakens the western individual in searching for their identity.

The issue of an individual's adulthood deserves attention at the point of their leap into adulthood. The latter does not happen as a one-time act, as an individual grows from birth to death. However, such a perception would be too diffuse and intangible, so it should be started from the point of view that there comes a period in an individual's life in which adulthood is most intensively activated and portrayed, based on which the individual takes on the role of an active citizen, becomes a responsible member of the societal chain and takes the reins of life into their own hands. Fromm (1989) generally defines this process of growing up as when, at the point of adulthood, the individual throws off the yoke of the elementary ties they cling to and ventures into the uncertainty of the adult world. By leaping into adulthood, individuals should detach themselves from the worldview they inherited from others, from tradition and culture, based on which they conceive and shape their worldview through which they experience themselves, others and the outside world.

The need to clarify adulthood would not be a priority without knowing that this adulthood is becoming increasingly relativised and causes an identity vacuum in the individual. Although the life of a modern individual is technologically incomparable with people from underdeveloped parts of the world, especially with life in still-existing tribal communities, there is no significant difference at the point of growing up. Individuals have always had to grow up and still have to today, regardless of the incomparability of lifestyles. The question of an individual's leap into adulthood was sometimes associated with initiation practices. These practices that took place — and that still take place in some tribal communities — are no longer as common within the modern world. Nor was the practice of initiation repeated at the national level in western society, as we know it from the Eleusinian Mysteries, which represented the major spiritual event first of the kingdom in Eleusis, then of the Greek state, and finally of the Roman Empire (Šav 2002).

Modern western society, based on the humanistic tradition, addresses the interpretation of adulthood at the institutional level within three central institutional initiators (state, school and religious institutions). A state correlates to the formal dimension of adulthood (a certain age as evidence of the formalistic dimension of adulthood). School as an institution refers to the socio-economic dimension of adulthood by supporting the growing population towards becoming socially and economically adult (acquired education as a tool for reaching this dimension of adulthood). In the case of religious institutions, irrespective of the humanistic paradigm and secular era, the dominant view of religious institutions lies in addressing ethical issues (not only for believers). These ethical issues go hand in hand with the ethical dimension of an individual. All three dimensions of adulthood symbolise the point of the individual's possible comprehensive adulthood. The liquidity of modern western society regarding adulthood is

a result of the fact that these institutional initiators are weakening, and they are no longer able to play the role of influential initiators for empowering growing populations towards the clarification of overall adulthood (the formal, socio-economic and ethical dimensions of adulthood). Accordingly, positioning adulthood has become too relativised. For instance, an individual may formalistically be an adult but not socio-economically and ethically an adult, or an individual may be an adult formalistically and socio-economically but not ethically.

The blurring of boundaries between old and young

This manifestation of liquid society refers to relativising boundaries between the young and the elderly. There is a systemic demographic disparity between the old and the young within modern western society. Despite the statistical numbers on the increase of the global population, there are more and more elderly people living in western parts of the world. From this point of view, it would be logical that the discourse concerning this population will prevail in society. Functionally speaking, such focus on the generation of the elderly is taking place because of the reality that an increasing number of them need more social and medical care. It makes sense that topics in this regard exist within society. However, the thematising of the elderly from a value-based and humanistic point of view is declining. Evidence for such a claim is visible within the intergenerational reality, where the living paradigm of young people increasingly dominates while the living paradigm of the elderly is losing its societal relevance.

The demonstration of the weakening of the living paradigm of the elderly is happening in different ways. First, there are terminological confusions regarding addressing the elderly population. When talking about young people, it goes without saying that when we compare young people by age, the term young is in general use but, in the case of the elderly, the same approach is not used, since the word ‘old’ is rarely used and is often replaced with the word ‘older’. At first sight it appears that, by addressing them as older and not old people, we are doing them a favour, but by doing so the definition constricts them, whereas ‘the elderly’ always refers to those who need constant care, which costs society a lot. Such an approach leaves out the much-needed discourse on the issues of age itself, wisdom, and the transience of humans, which involves questioning the role of the individual as a humanistic individual in today’s unpredictable times. At the same time, we encourage the elderly to be active throughout their lives, which is, on the one hand, welcomed, but at the same time this aspiration also weakens the living paradigm of the elderly to some extent. It is as if society wants everything related to ageing and old age to be relegated to the background to such an extent that we talk mainly about different forms of being young as a sort of a prolongation of being youthful until the end of life. It is reminiscent of a ‘Brave New World’ society with the elderly but without wrinkles and grey hair, which Aldous Huxley (1983) predicted back in 1932.

It is not about problematising the relativised physicality that comes about due to the beauty industry, which wants to nip everything related to ageing in the bud, but rather the issue of the identity of the elderly is at stake here. If the living paradigm of young people symbolises beauty, energy and vivacity of life, then the living paradigm of the elderly should symbolise wisdom, respect and the prudence of age. Encouraging the elderly to be more active, including through learning, especially if they did not have the opportunity for education during their lifetime, is highly desirable on the one hand, while on the other

hand, such promotion of an active approach distances them from the living paradigm of the elderly, which is their own and should be the stronghold of their wisdom. It is commendable that the elderly can compete psycho-physically with young people and thus make themselves seem younger. But the question of what younger generations can gain from such competitive seniors in such a case should not be ignored. On the one hand, young people can be grateful to these competitive seniors, as such seniors serve as proof of being joyful and full of life at an advanced age while, at the same time, such seniors deprive younger generations of the issues about age, transience, self-transcendence and, ultimately, death. Regardless of how hard active seniors try, they cannot avoid their physiological state weakening over time. To reiterate, by encouraging the elderly to be more proactive, something is taken away from them at the same time — a kind of right to wholeheartedly face (for example) their fears about death and transience. Here we get to the core of the problem, in the sense that the primary problem with the themes of death and human transience is not the elderly but primarily the younger generations. Considering namely the observation that these generations distract the elderly from thinking about these life topics, in reality, young people themselves run away from the thought of what inevitably awaits them in old age.

The living paradigm of the elderly is also shrinking due to the loss of possibly the last relevant social role: acting as witnesses of the past. In connection with the virtual age and virtual Galimberti (2015: 56), he claims that a technological revolution has happened to ancient people. In the sense that, due to the internet and virtual technologies, they have lost the crucial role they played decades ago. That is, the role of a storyteller or those who prospered by keeping young people attentive to their accounts of the past. But now that the younger generations have the internet at their disposal, where they can google all the history the elderly used to tell, the younger generations no longer listen to the elderly.

However, this is not only about the disappearing role of the witness of the past among the elderly but also brings with it the question of the relativisation of wisdom in this population. Indeed, it seems that a wise man cannot be wise (only) to himself and for himself, but this wisdom needs to be shared with others, because only in this way does it become valuable as a message. It means that the question of the wisdom of the elders belongs in the intergenerational context, where the old person shares (or is supposed to share) their wisdom with younger generations. When dealing with the elderly, it is always relevant to ask how much wisdom the elderly in general possess, and, what is even more crucial, whether the younger generations can absorb this wisdom? To put it more directly, do they care about this wisdom of theirs, whatever it is? Due to the predominance of the living paradigm of young people, it is evident that the elderly are pushed more and more into the societal background and that younger generations do not want to be consumers of their wisdom.

A loosening of the boundaries between the original and the superficial

The following demonstration of liquid society relates to the fact that individuals have been facing an increasing amount of artificiality in the western world. This artificiality comes out because of the vanishing of originality, which presupposes a further loss of identity foundations for the individual. This gap between original and artificial is emerging in many spheres. We highlight here a few central spheres: in correlation with religious doctrines; the practicing of eastern philosophical practices; the relativisation of the cultural role and the role of food in society. When it comes to religion, being focused on values and transcendence issues, the traditional church is losing its power on the level of playing a sort of moral-ethical compass within societies, not only among believers. In parallel with this, it seems more and more

transparent that the gospels are increasingly weakening within individual religions and that religions are becoming too involved (or meddling) in socio-political issues (abortion is one of the most current and high-profile examples of this). On the one hand, it is to some extent welcome that religions intervene in the social sphere, especially in their charitable activities. However, this does not outweigh the fact that if they stray too far from their fundamental mission, which is to spread the gospel among believers, they become more and more artificial and distance themselves from their original spiritual role.

The field of transmission of eastern religious and philosophical practices is the next manifestation of the loss or weakening of something that used to be original in the past. That relates to the fact that the teachings of these philosophies, especially in recent decades, when they have widely penetrated the modern western world, have been pragmatically reduced to the level of spiritual weekend courses and offering various formulas for searching for personal happiness or career satisfaction in a few short steps. Even more demonstrative is the example of different yogic practices, where teachings mainly relate to recreational engagement with the body. With this loss of their original meaning, these practices acquire the contours of something too superficial.

The culture within the fields of art, media and cultural heritage is strengthening towards entertainment orientation (by exposing all kinds of stand-up comedies and entertainment theatres), according to which culture finds itself becoming a ‘showman’ for people. In the last decade or two, there has been a particularly noticeable trend of multiplying stand-up events, which, with their focus on the superficial, deliberately push the role of artistic practices to the level of entertaining the masses. With this, that part of cultural-artistic practices, when it appeals to its audiences in such a populist way, also distances itself from its original cultural-artistic role and pushes it into the lap of social relativism, away from the possibility

that culture acts as a foundation for an individual's identity within society. Cultural heritage within culture has, for example, been reduced to the level of a marketable commodity with the rise of mass tourism and is becoming one of the central market niches for tourism development within the western environment — while cultural heritage is losing its original cultural and traditional identity message.

The area of modern nutrition, which is increasingly grounded in industrially processed food, is the next area losing its original role. In the flood of construction of shopping complexes outside the urban cores of modern cities, these consumer-market conglomerates are becomingly increasingly artificial. It is otherwise welcome (ignoring the excessive strain on the natural environment) that individuals have a chance to consume food from practically everywhere on this Earth. However, this type of food paradigm encourages the domination of increasingly processed food, which the modern individual consumes more and more (often also at the expense of their time). It is characteristic of this industrially processed food that, even though individuals are eating more and more of this type of food, they are getting fewer and fewer of the nutrients necessary for good physical health and functioning. The paradox of this kind of food consumption is that the individual balances the energy situation in a way that accelerates the consumption of this type of food. Of course, the issue around this type of eating is not only about taking care of the body but is also an identity issue since local food also represents an identity basis for those local people from where the food comes. As there is more and more industrially processed food (although recently it is true that there have been trends in the opposite direction), both the act of eating and food itself are gaining the primacy of something more and more artificial and losing the character of something original.

Relativisation of body identity

From the point of view of an individual's identity, the body is a point that should not allow any doubt. Even if an individual is confused about their social identity, their identity still strongly relates to their body as the foundation through which the individual first identifies themselves or how others recognise them through their body. Whether the individual is satisfied with their body does not play a role here. If, for instance, an individual does not like their body, and it is a burden for them (especially when entering the adolescent period), their body is even more of a wearable pillar of identification (unfortunately, in a negative sense). In the field of the individual body, we witness two types of phenomena emerging that will come up against each other in the coming future. The gap between these two types brings additional confusion regarding bodily identification for the individual. This kind of body relativisation is another demonstration of the fluidity of modern western society.

The first type of phenomena is related to the body as an increasingly important identification factor in an individual's identity. Not only at the level of an identification tool for building social identity; the body is also increasingly becoming the central bearer of such social identity in an individual. The increased focus of the individual on a healthy lifestyle should not, therefore, be understood only in the light of caring for a healthy body but rather in experiencing the body as a central pillar of one's identity. In this sense, it is possible to observe characteristic communication trends in the professional fields associated with appearing in the media. In addition to mastering professional work, the need for physical attractiveness takes an important role. Here, above all, the media practice a combination of knowledge and physical attractiveness (for example, in the case of more popularly oriented media,

the gap between professionalism and physical beauty has already been somewhat redirected, to the detriment of professionalism), regarding which the media authorities (especially in the field of television journalism and reporting) increasingly bet on the physical attractiveness of the performers, and where the importance of their professional journalistic knowledge is becoming less crucial. Even in the sports fields, it is becoming more and more typical that the media and, in correlation with advertisers, emphasise the physical appearance of sportsmen and women in top sports. It is no longer only victories that count but also the physical attractiveness of the performers. Such trends were noticed some time ago by competitors from various sports, from skiing, swimming and tennis to athletics, when athletes delight their fans and the wider online audience with photos of their attractive bodies via social media. In this way, they promote themselves — probably with the intention of attracting additional advertisers.

As for comparing beautiful and young bodies, the matter with the latter is much more challenging for an individual because the ageing process does not stop in an individual. However, this does not deter an individual from also aiming to maintain a young body at any cost. As a result, the individual increasingly strives to interfere with their body, even if this often has nothing to do with health reasons. An individual's desire to stay young demonstrates that we have moved away from the past when the elderly satisfied their thirst for youth with the mantra of being young at heart. Today, an individual wants to be more and more youthful for the rest of their life, physically and literally, with the help of plastic surgery and other beauty procedures and accessories. The existence of plastic surgery has long ceased to be the domain of Hollywood, where star actors began to undergo body rejuvenation decades ago to maintain their acting status for as long as possible. Therefore, it seems that the society of Brave New

World (Huxley 1983), where the inhabitants of his vision marvel even at those last loners of the human species who have wrinkles and grey hair, is drawing closer. With the advent of the mass internet, starting between 1980 and 1990 (Slak 2007: 4-5), the beauty industry and its entire range of services became accessible to anyone, which further multiplied the growth of cosmetic surgeries and all other beauty interventions. The forecast for American plastic surgery is highly demonstrative of this: the number of plastic surgeries has been considered for quite some time no longer in the thousands, but in the millions. For example, in 2020, plastic surgery exceeded 15 million operations (American Society of Plastic Surgeons 2020).

Another type of phenomenon, which is emerging regarding an individual's body, has to do with body relativisation. Healthcare and medicine are enthusiastic about development, where the individual will have more and more opportunities to exchange as many organs as possible. From the point of view of health, this prediction is welcome, as it looks like the individual will have more and more of this type of medical treatment and care in the future. From the point of view of identification and, consequently, of identity, this development forecast, after the (too) self-evident replacement of human organs, raises concerns. Faced with the fact that the individual relies more and more on their body for their identity, medical development may trigger the dilemma of what remains irreplaceable and thus original about the body, with which the individual proves their bodily integrity and identity. In the name of health, the individual agrees to many things, but as long as we are talking about replacing legs, arms, hips and even internal organs, things still seem manageable. Heart replacement, which has been a medical fact for some time, is already somewhat specific, embedded in an emotional and experiential context, since

there is an assumption that the human heart is not just a mechanical pump. During the operation, a heart patient receives a new heart from the donor and some of their character. Such belief appears in films and personal testimonies of those who have received a donor's heart. Even more shocking is the prediction about the capabilities of human-to-human head transplantation (MMC RTV-SLO 2015, Baković 2015). Predictions regarding such experiments seriously questioned the paradigm of the body as an identification pillar through which an individual identifies themselves and others identify them. Even more importantly when we speak about head transplants, this involves the brain, which is related to the rational and emotional components of the individual, where a head transplant would call into question the pure existence of the individual in their essence. This dilemma may resonate even more among those who treat their body as indisputable foundations and do not accept the possibility of a separated human soul. Just thinking of a head transplant can seriously shake the value system in the individual because, at the level of physicality, even if we leave aside the rational and emotional dimensions, nothing will remain sacred and untouchable, and the meaning of the body would be subject to definitive relativisation.

The role of the body as a carrier of individual identification weakens as well due to robotisation. Above all, that part of the most advanced robotisation aims to create androids that will be more and more like a living person, first physically, and, later on, experientially. Regarding this gap between humans and robots, the elementary debates go on about what will be the most human thing in the future, by which the individual, as a member of the human species, will fundamentally differ from androids. The body of the individual will not be the factor by which the individual will be distinguishable from the android, as the latter will physically resemble a human more and more (Rogers 2014). At the same time as the

development of androids, there are also ideas for the planned creation of human robots, where the development process is the opposite. Under this opposite scenario, the human robots are not about developing the best possible androids but about creating a combination of the human body with digital technology, where digital and mechanical devices and elements become parts of an individual's body, based on which the individual as a human will acquire an increasingly authentic robotic character (Estulin 2014).

In addition to robotisation, there is also the rapid development of human holograms, which are already relevant and usable, especially within the music and celebrity sphere. The emergence of holograms, as the virtual bodies of deceased celebrities, is gaining a new economic posthumous dimension, where those who collaborated closely with the celebrities during their lifetime will earn money on their account after their death. We already know of cases of dead stars performing as holograms at concerts (Spanos 2015). The development of holograms is moving forward at considerable speed, meaning that holograms will also soon be tangible (Ballard 2014).

Mixing the boundaries between physical and virtual reality

The emergent form of a liquid society also manifests in the increasingly hazy border between what is real and what is virtual. In this sense, the identity crisis comes out due to the loss of the impression of what is supposed to be realistic today. The global-virtual identity paradigm mentioned above, despite its fluidity, as pointed out by Bauman (2002), nevertheless resolutely enters the emptied identity vacuum, and fills it with artificially created and virtual contents. Firstly, it is worth mentioning the appearance of various dimensions of reality shows and broadcasts, which have greatly multiplied since the late eighties (Nahtigal

2008). Their existence and multiplication are supported by several common or even trivial reasons, from the economic goals of their creators, the temptation of various prizes, and the search for recognition for career and other ambitions among competitors, to the search for usable information, entertainment, relaxation, and the voyeuristic tendencies evident with television and online audiences. Despite their apparent triviality, these shows and broadcasts touch an individual's life more deeply. With their different appearance, they expose the relationship between more and less realistic dimensions in an individual's life, indirectly communicating that the individual is increasingly faced with the deflation of the real and is therefore (un)consciously looking for ways out of the vicious circle of this decadent reality. In this regard, reality shows and broadcasts recreate real life by creating artificial situations and precisely staged reality, and they direct the individual's consciousness and activate their feelings. The individual's real life is increasingly relativised, impoverished and emptied of reality.

The reality of the modern individual additionally blurs in the light of favouring all that is virtual. The increasingly sophisticated virtual technology and virtual reality place the individual in a dilemma: which life is more realistic, the physically tangible, or the virtual? It seems that the relationship between the meaning of the real and the virtual among the younger generations is steadily leaning towards the latter, in that the existence of the physical environment, the city, the road, the sidewalk and the bus, is pushed more and more into the background, while their mental focus on the virtual environment escalates. Avatar virtual worlds also belong here, where individuals construct avatars in order to escape from reality and real life. For an individual, the avatar self may mean not simply an innocent identity game alternative; it may also seriously interfere with the core of their real physical and social identity. The individual faces the challenge

of being certain of where their real identity ends and their virtual identity begins. Elias Aboujaoude (2011) calls this virtual identity of an individual an e-personality, which increasingly displaces their real personality in life. Such a scenario leads to personality disorders in the individual, at the level of a split personality, with the characteristics that one of their personalities is virtual but still problematic. As the tip of the iceberg, the boom in virtuality is to take the increasingly rapid development of artificial intelligence, where, despite its indisputable usefulness, even eminent scientists such as Stephen Hawking (2014) warn that there is a danger that artificial intelligence will be the last human creation. Since the development of artificial intelligence is not stoppable, it is necessary to be extremely careful in placing its existence in the most manageable ethical frameworks possible (Bostrom 2003). Although the direction of the development of artificial intelligence and the level of its regulation are difficult to predict, there is no doubt that it will also have a tremendous impact on individual identity.

Identity crisis, humanism and human identity

Identity crisis

Socrates says ‘Know thyself!’. Without a strong perception and knowing who we are as individuals (declarative level is not sufficient in this regard), it would be a challenge to identify our wishes and ways and where to go in our lives (personally or professionally). Socratic thought is nowadays more important than at any time in recent history due to the accelerated changes in modern society, based on which this society is transforming into a liquid world, as highlighted in the previous chapter.

At first glance it seems positive and desirable that the modern western individual frees themself from traditional patterns and identity frameworks and builds their identity image through their world of thought and experience. However, such an assumption is questionable and overly optimistic, as it would mean that the individual proactively creates their own identity framework. That sounds too optimistic because the belief that, before the formation of liquid society, individuals looked for life meaning on traditional identity grounds is fundamentally wrong. The reverse phenomenon existed, where traditions (national, cultural, religious and others) gave meaning to an individual by framing their identity framework, within which he performed predefined social roles within society. Now we are witnessing a phenomenon where these traditional identity holders are losing power and attractiveness at the expense of the liquid world. Therefore, individuals no longer have this privilege as their predecessors did, where the vast majority

have not found themselves in a position to bother about life meaning because the latter was already given to them or determined in advance. Moreover, as Berger and Luckman (1999: 39) claim, modern pluralism undermines any self-evident certainty, not only identity certainty, since everything, from the world and life as such, is becoming more and more questionable and coloured by relativism. Berger and Luckman (ibid. 37) continue: 'Old systems of values and interpretations are "decanonized". The result is the disorientation of individuals and entire groups, which has been the main topic of social and cultural criticism for many years. Categories such as "alienation" and "anomie" indicate the distress of an individual who has to find his way in the modern world.' Weakened tradition thus allows the individual, on the one hand, greater freedom, and the possibility of a different life but, at the same time, also the hardship and pressure of uncertainty, which the new social reality brings. From a past perspective, the majority did not even mind that traditions dictated their life meaning since all those against such predetermination were always in the minority. They, then and still today, searched for their transcendent meaning outside the established and inertial identity frameworks provided by tradition. Berger and Luckmann (1999: 41) say that they operated outside established social guidelines, where the traditional authorities, considering that it was a rare case of searching for a different meaning outside existing social manners, did not object to such search adventurism.

The main problem with the identity crisis of the modern western individual is not that the individual is disabled in the search for life meaning but that the situation pushes them more seriously into this search. In this era of the emerging liquid society, it is happening for the first time when most people have found themselves in a position to focus on their life meaning because the traditional identity frameworks are weakening. Therefore, the individual faces the challenge of searching for this meaning in a (more) conscious way. Frankl (2005: 109) illustrates this living vacuum of the modern western individual very directly: 'In comparison with animals, a human does not follow the instincts about what he should do, and unlike individuals from the past, he does not automatically follow tradition anymore about what he should do. Because he does not base himself on his instincts and traditions anymore, he somehow no longer knows what he wants. And so, he only wants to do what others do — conformism! Or he does what others want — what those others want of him — potential totalitarianism!'

It seems clear that the absence of traditional identity frameworks in an individual does not mean an identity vacuum in which the individual would float freely as an identity but that other content (perhaps even totalitarianism, as Frankl suggests) rushes into this vacated place. We focus here on the emerging virtual global identity guidelines, which are slowly but steadily intruding into the area of traditional identity frameworks. The above is possible because an individual suffers from different kinds of disorientations. First is career disorientation, because liquid society allows domination of a 'limitless career paradigm' within which people, especially young people, are losing their orientation capabilities on which foundations to build their career path. Second is reality disorientation in the individual, about finding a balance between their real and virtual worlds, regarding which an individual is becoming increasingly susceptible to the virtual world and virtual technologies. Third, value disorientation among individuals is

due to the general disorientation of values within modern societies between traditional values, universal values (human rights, ecology) and global values (global consumerism, economic deregulation in terms of neoliberalism). Modern individuals thus face dilemmas regarding their beliefs, virtues and life meaning (regarding what to believe, what to stand for and where to find role models). It is almost possible to speak about a kind of moral nihilism (Umberto Galimberti 2009), where the global consumer mindset, hand in hand with virtual technologies, has taken a dominant role in orchestrating the ethical compass of many people (especially in the younger generation). It is specifically young people who are experiencing a significant shift in the values field of the future (Global Europe 2050, 2012: 72). This phenomenon of identity crisis touches on the essence of humanism itself.

Human identity in the light of humanism

The significance of humanism in the present era is irretrievably weakening, or even more than that, it is coming to an end (Harari). Humanism places humans on the throne of the highest authority, which relates to their experiences, sensations, emotions and thoughts. Humanism defends the idea that humans are competent at developing their human virtue, in all its forms, to its fullest extent (Robert Grudin 2019). According to this humanistic thesis, people are supposed to be capable of having the greatest knowledge of themselves (Harari). Concerning humans' highest virtues, it is possible to insist that a negligible percentage of humans are seeking to attain the fullest realisation (i.e., Maslow's self-realisation model or searching for the higher self, whose importance is visible in several philosophical doctrines and practices). Regarding the claim that humans are the best connoisseurs of themselves, Harari points out that AI and its advanced algorithms will shortly be able to know more about humans than they can know about themselves. It is, therefore, very likely that humans will lose the motivation to develop their virtues to their fullest extent and start to rely on algorithms to explain their needs, wishes and interests to them — and which decisions need to take place accordingly. Such a scenario, very likely according to Harari, may appear attractive at first sight, but it automatically leads to (total) loss of human privacy.

Humanism in the light of self-knowledge

The answer to the question of who the most thorough examiner of humanism is would probably surprise us. These are not the humans themselves, nor the humanities or social sciences, which are supposed to watch over the realisation of the humanistic tradition, but dataism (data-ism). David Brooks (2013) was the first to use dataism as a new concept in the light of thinking about where the future is taking us in the face of this flood of data in the form of Big Data, which technological multinationals are constantly collecting about humans. Dataism as a doctrine has become notable thanks to Yuval Noah Harari and his book Homodeus (2017). According to Harari, the definition of dataism goes something like this: ‘Dataism symbolizes emerging ideology or even a new form of religion, in which information flow is the supreme value’. Although the definition works clearly, it is still challenging to fully understand what dataism is supposed to be or represent.

In the light of humanism, dataism relates to humans at the point of their self-knowledge. It is realistically possible that dataism will increasingly begin to displace this humanistic pillar of self-knowledge. The latter supports the thesis that individuals have the greatest knowledge of themselves. Dataism is slowly demolishing this self-evidentness because, with all the available data that dataism can obtain about an individual, it will soon know more about the individual than the individual knows about themself. It firstly goes towards obtaining data about the human body at the level of monitoring its bodily functions. This reality will become possible when people agree to have various miniature devices implanted in their bodies, which gather information about them and how their body behaves (Estulin 2014). Although we

may have a series of reservations about agreeing to this when it starts to happen, Harari (2017) warns that our health, for example, is an area where we willingly agree to everything to avoid health problems. The acquisition of data about people also covers the behavioural level, where technological multinationals, as the protagonists of dataism, collect all possible data and analyse people's behaviour with a view to using the findings in the development of artificial intelligence. Gathering such physical and behavioural data about an individual will lead to the fact that algorithms will increasingly intervene in all possible areas of an individual, offering that individual advice relating to their personal life, career, relationships and employment. With this, people will increasingly leave decisions to these algorithms and consequently undermine their human authority. For dataism to come to life as this theory predicts, individuals will have to give up their privacy and accept that algorithms will record and analyse their lives more and more systematically. With this, dataism will become an alternative pillar of human self-knowledge.

Inclusive education, persons with disabilities (PWDs) and adult education

Personal and social identity of an individual

Identity itself is a very complex phenomenon, which allows different interpretations. In humanistic doctrine, for instance, there are many potential relationships within which identity may be addressed (i.e., between different perceptions of identity, such as personal–societal, real–virtual, self–higher self, experiencing–self narrative, given–discovered). It is also possible to address and reflect identity considering the age of the individual. In this situation, we use the relationship between the personal and social perceptions of the individual's identity. Personal perception refers to personal-career-schooling issues, survival, benefits, and interests. It presupposes the pillar of self-knowledge in the individual within the humanistic doctrine. Social perception refers to the individual's highest values about transcending themself and fighting for broader social goals. In this dimension of identity, the individual faces frustrations and aimlessness due to the emerging liquid society. In this direction, as already emphasised, the traditional pillars of identity are losing their strength, based on which the individual can no longer lean their social identity on something bigger than themself (such as satisfaction with the attraction of the country, national, regional or community affiliation, culture, religion, which would go in the direction of their self-transcendence).

Since individuals have limitations in addressing this social identity, they depend on their own self regarding this part of their identity. This challenge gives rise to the paradox whereby the construction of an individual's social identity is increasingly impoverished and disoriented, while, at the same time, the individual becomes more and more self-obsessed, a follower of the 'I' generation, where they need all external stimuli for strengthening their — either personal or social — perception of identity. The global phenomenon of the selfie appears here as ordered, as it reveals how individuals previously took pictures of everything around them, while today, in the 'selfie pose', they increasingly take pictures of themselves. Such individualistic behaviour exposes how an individual uses new environments as external circumstances for identity 'building up of themself'. The phenomenon of narcissism, highlighted by Twenge and Campbell (2013), is further proof of this modern human orientation towards the 'I'. There seem to be very likely reasons why an individual pays so much attention to a healthy lifestyle, personal growth and care for the individual body. The biggest problem here is that an individual tries to strengthen their social perception of identity by putting additional attention on their 'I' image and its visibility.

Therefore, lifelong learning (LLL) plays a crucial role, as it potentially helps individuals to overcome personal identity in the direction of transcending mere individual survival and self-care. LLL supports individuals in unleashing their true intrinsic potential. And, just as importantly, LLL plays a significant role in helping individuals compete in the future with AI-based robots that will increasingly replace the human workforce. Namely, robotisation (in line with AI and its algorithms and biotechnology) will soon approach several working occupations with cognitive demands, which until now was a human domain (Collins 2013, Benzell 2015). Even though humans base their working abilities on human consciousness and intelligence, while robotisation (including artificial intelligence and its advanced algorithms) relies solely on

its intelligence, human workers will soon become disadvantaged compared with robotisation. Due to such a development scenario, economic systems and employers will give an advantage to intelligence, while consciousness will slowly lose its significance in performing cognitive working skills (Harari). Moreover, according to Harari, a difficulty for humans will not just be a loss of jobs but the loss of their personal relevance (an impression that systems of power within society do not need them any more).

To make humans more competitive in the coming future and to avoid humans losing their relevance in this future, modern society needs alternative educational methods and approaches. They will serve for more precise development of the capabilities of younger and older generations in the unpredictable working sphere. The high percentage of current professions (manual and cognitive) will slowly disappear in the coming future. More importantly, it is challenging to develop a helpful prediction of what kinds of jobs will be the most relevant in the coming future (except known answers on a general level about the importance of soft human skills for the working sphere). Therefore, according to Harari, education needs to equip young and old generations to be capable of constant personal re-inventions since they will need to shift professions each decade or even more often. An educational philosophy for helping working people towards constant re-inventing looks to be the only usable educational strategy in the years and decades to come. To make LLL even more effective and productive, it seems necessary to put additional focus on Inclusive education (IE). This inclusive educational concept has been playing a significant part in adult education.

Complexity of inclusive education

Inclusive education is the term that triggers many understandings among all kinds of subjects that address it directly or indirectly and for different reasons. The contexts or starting points wherein inclusive education appears also need consideration. Linking inclusive education with persons with disabilities (PWDs), having in mind all kinds of disabilities, makes this term and its definition even more challenging. The difference in a different interpretation of inclusive education arises from an elementary question as to which educational element (i.e., teaching practice, learning practice, equal access to education) the adult learners in adult education are included within. Considering this elementary question, it is necessary to focus on inclusion within inclusive education by splitting it into three different types.

Type 1: Inclusion as developing a more dynamic teaching process

This has to do with the fact that learners are encouraged to approach the teaching process in a more vivid and interactive way. It means that inclusion is interpreted on the level of implementation and associated with a more dynamic educational strategy (group work, sitting in a circle, intensifying practical exercises, practical work, interacting through conversation). This premise of inclusion within the education process involves attempts to make the teaching process more interesting, enjoyable and interactive, and how to gently encourage learners to become more (pro)active individuals in the teaching process.

A very convenient demonstration of this type of inclusion can be found in the doctrine of ‘flipped learning’. This is promoted as a teaching practice designed to achieve a higher level of learner engagement in the education process. To put it more concretely, we can quote Lesley University: ‘Flipped learning is a methodology that helps teachers to prioritize active learning during class time by assigning students lecture materials and presentations to be viewed at home or outside of class. One of the most exciting advancements in the modern classroom is flipped learning. It hinges on the idea that students learn more effectively by using class time for small group activities and individual attention. Teachers then assign learners lecture materials and presentations to be viewed at home or outside of the classroom day, prioritizing active learning’ (Lesley University 2022).

An idea of flipped learning is that independent learning by viewing short clips takes place outside the school space (and time), while lessons serve as a time for research, collaborative work, project work, problem-solving and discussion. This approach turns traditional pedagogical practice upside down, where teachers and learners are together (lessons) and use the time for problem-solving, collaborative work. Flipped learning highlights the four pillars of this kind of learning:

— flexible/adaptive environment
(adjustment of temporal and spatial aspects of learning
according to regular monitoring of listeners),

— approach to learning
(learning culture based on student-centred pedagogy,

— differentiated content
(based on what the teacher explains and what the learners can research on their own),

— expert practitioners
(professional teachers who formatively monitor their learners and reflect on their practice
(Didakt.UM 2020).

Flipped learning, despite its innovative teaching approach, is still an approach that needs an upgrade. Attempts regarding this flipped learning included how to make the teaching process more applicable for learners. To put it another way, this level of inclusion refers to teaching (and not learning) practice on how to make teaching approaches better within adult education environments by arguing that the inclusion of the learners would increase if teaching practices improved. The usage of digital training styles often belongs to this mental framework, where digitalisation is to make knowledge offered to learners even more accessible. From the point of view of acquiring and understanding new knowledge, more dynamic educational strategies are not controversial but highly desirable. However, we need to be aware that more dynamic learning strategies still represent a conservative-classical education doctrine, concerning which the learners accept new knowledge while discovering their potential is not at the forefront. In other words, the target learner is still a product of the education system and not the other way around.

Type 2: Inclusion as a self-regulated, self-directed and self-determined learning process

This level of inclusion in the educational process goes one step further regarding the relationship between the teaching and learning process. At first sight, this level looks like the previous one, as it pays attention to the above-mentioned flipped learning. However, this second level of inclusion puts central attention on learning and not the teaching process. Specifically, it means that learners during the education process are more capable of systematically running their learning process, which automatically impacts the teaching process given by providers. Within these learners' capabilities to master their educational process it is possible to distinguish between three kinds of self-leading of the learning process: self-regulated, self-directed and self-determined learning. Although these types of mastering learning are not that different from one another, it is possible to find some differences regarding the extent to which learners run their learning process by themselves.

The first learning approach is about Self-Regulated Learning (Zimmerman 2002, Zumbrunn et al 2011). This sort of learning literally means, and we quote: 'Self-regulated learning is a cyclical process, wherein the student plans for a task, monitors their performance, and then reflects on the outcome. The cycle then repeats as the student uses the reflection to adjust and prepare for the next task. The process is not one-size-fits-all; it should be tailored for individual students and for specific learning tasks' (Zimmerman 2002). This approach differs slightly from flipped learning in that learners are a bit more proactive in planned learning and there is a greater emphasis on self-reflection on their learning.

The next learning approach is Self-Directed Learning. According to Knowles, ‘Self-Directed Learning is a process in which learners take responsibility, typically under the guidance of an instructor, for diagnosing learning needs, articulating learning goals, identifying materials and resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes’ (Knowles, 1975, 18). In terms of learner independence, this learning is more demanding than self-regulated learning as the learners are additionally guiding their learning process.

The further approach is Self-Determined Learning. According to Blaschke, ‘Self-Determined Learning is a process in which learners take initiative for identifying learning needs, formulating learning goals, identifying learning resources, implementing problem-solving strategies, and reflecting upon the learning processes to challenge existing assumptions and increase learning capabilities’ (Blaschke, 2012). Jennings adds here that ‘Self-determined learning centers on “learning how to learn”. Students who can reflect and make decisions about their learning will be empowered through motivation, flexibility, and self-awareness. Schools are attempting to prepare students for careers that generally do not yet exist. The best way to help students become future ready is to guide them towards becoming self-determined in their learning. Upwards of ninety percent of our learning will occur outside formal educational settings’ (Jennings, 2010). The approach to self-determined learning relates to the previous ones about self-regulated and self-directed learning and is the most demanding of all three in terms of learner independence.

However, it is necessary to be realistic that such a high level of independence among learners is too demanding for some teaching environments and specific groups of learners. Of all three approaches, the last two are additional demanding and achievable, especially for formal educational systems. Although, bearing in mind that we are dealing with the project with non-formal adult education, it is possible, at least hypothetically, to consider all three learning approaches. It is important to highlight again the last approach, self-determined learning, as part of the point where authors expose that the unpredictable future dictates the need for learners to be capable of mastering this self-determined learning (since schools, regardless of the types and levels of education, cannot be expected to prepare learners for occupations that do not yet exist). In this sense, this self-determined learning (including also the previous two approaches), to prepare learners for a more self-driven learning path due to a challenging working future, primarily involves the survival side of the individual in the future working area (in competing with AI and other kinds of robotisation in this regard). Within humanistic doctrine and its two humanistic pillars, self-knowledge and self-transcendence, these learning approaches refer to self-knowledge. LLL, based on the Inclusive education doctrine, also needs to support modern individuals in revitalising their weakened human identity. And this has to do with the resuscitation of the humanistic origins, which are weakening due to the dataistic society of the future. In other words, we also need inclusion on an even more advanced level, which will touch on individual humanism related to the pillar of self-transcendence.

Type 3: Inclusion as discovered and developed learners' innate knowledge

Following the need for modern western individuals, considering the emerging liquid modern society and weakening of humanistic origins, to develop professional capabilities to be an active part of society and, at the same time, to strengthen their social perception of identity, education needs to seek even more ambitious teaching approaches. A further level of inclusion related to the identification and triggering of individuals' innate knowledge has the most direct link to this humanistic pillar of self-transcendence, based on which the individual will strengthen their social identity and, accordingly, not be occupied predominantly with a purely personal identity. Considering this kind of innate knowledge, it is necessary to have a common understanding of this term.

Speaking generally about the terminology of knowledge (the latter term is used here independently, not as knowledge as one of the elements within different kinds of competences' frameworks), we refer to a clear distinction between two types of knowledge at the individual level: innate knowledge (something an individual is born with rather than something learned through experience) and external knowledge (that is acquired through all sorts of education or by chance anywhere). These two kinds of knowledge intertwine in an individual's reality, where innate knowledge (in terms of potential, talents and gifts, when discovered and activated) gains additional potency when strengthened with external knowledge. In this duel between two types of knowledge, it looks like innate knowledge is often (overly) neglected, and too much attention within educational environments belongs to external knowledge (Center Spirala 2007).

We are concentrating here on this innate type of knowledge, as a greater focus on this knowledge emerges as a usable opportunity for an individual to strengthen their social identity and thus also strengthen their humanistic origin. By following the latter assumption it becomes clear that innate knowledge in the individual, after activation and empowerment by externally acquired knowledge, not only serves to make an individual capable of pursuing a career (educational-working-employable issues) but also helps them strengthen their identity. For one simple reason: innate knowledge, when activated, touches an individual more profoundly and comprehensively. In correlation with the relationship between the personal and social identity of an individual, it directly means that an individual, by being primarily grounded professionally on this innate knowledge, automatically strengthens their social identity as well, which is nowadays weakening due to the aforementioned liquid society.

To approach innate knowledge, the individual needs to activate two thinking processes, logical-rational and insightful. Such a synthesis of these two processes is necessary so that individuals can thoroughly self-examine and clarify within themselves in a contemplative spirit the otherwise well-intentioned humanistic programmes (to be ethical, human, conciliatory, balanced in personality, altruistic and based on values). By being attentive that becoming human (in terms of ethics, altruism, personal balance...) does not appear as an external program that supposed to be internalised and trained (as acquisition of concrete skill that is achievable through repetition of certain training steps), but something that comes out through insightful awakening individuals' ethical essence. The insightful (re)vision of humanistic

programmes appears to be the key to returning individuals to the original humanism, which is intrinsic to them. The strengthening of the humanistic pillar towards self-transcendence seems to be a significant ideological and strategic strategy for the modern individual. To help an individual to better face the invasion of dataistic algorithms, where the latter will begin to offer individuals a favourable life at the expense of a weak identity, loss of privacy, and virtual addiction, in the symbolic image of mana. To avoid such a potentially pessimistic scenario, which was prophetically predicted by Aldous Huxley in his Brave New World (1983), we must urgently insist on humanism and being fully attentive to its pillar of self-transcendence. Such a development scenario looks like an individual's only way out of developing the wrong way.

Between (dis)covering and developing learners' innate knowledge

There are more steps to the activation and further development of innate knowledge in the individual, but it seems relevant to highlight and distinguish here only two main milestones. The first milestone is about (dis)covering innate knowledge. It means that the individual has not (yet) come to clear about or at least have a rough impression of their innate knowledge. The second milestone is about developing an innate knowledge of the individual. This milestone can start when the individual has come to a clear understanding of this knowledge (or at least that individual recognises the rough beginnings of this kind of knowledge).

(Dis)covering learners' innate knowledge

Inclusion here is based on attempts where adult providers strengthen learners' insightful thinking towards the identification of initial outlines of their innate knowledge. There could be different approaches to addressing this challenge, but we highlight here the strategy of approaching an individual's thinking process. In a way, adult providers within the teaching process systematically consider and distinguish two kinds of thinking in learners: rational-logical and less noticeable insightful thinking (in terms of triggering mind insights). To come closer to such activation of such thinking, a sort of mind-deprogramming of an individual's rational-logical thinking needs to happen. Center Spirala (2007) developed a thinking model of selfmobility, which addresses this challenge of parallel dealing with rational-logical and insightful thinking in individuals. It is worth pointing out that this kind of insightful thinking differs from rational-logical thinking in that it takes place in the reverse order, where the individual first gets an insight and then defines it verbally (Ash et al. 2012, Klemm 2014, Sotto 2007: 51-54). Attempts to systematically create mind confusion in a person, which aims to wake up such insightful thinking, can be found in some educational tactics. De Bono (2006) encourages this kind of mental confusion in his learners through lateral thinking linked to the strategy of provocation, which he uses as one of his central tools. Even more elementary and ancient is the well-known Socratic Maieutics method of questioning, which, through its process, deliberately triggers resistance in the individual, a kind of mind embarrassment (Sloterdijk 1996). Commonly known and present in Eastern philosophies are also Zen Buddhist koans, which are used for causing mind confusion in an individual's logical-rational thinking (Heine and Wright 2000).

Developing learners' innate knowledge

This phase occurs during the teaching process when the learner reaches a clear understanding of their innate knowledge. The learner accordingly needs additional educational support to further develop this type of knowledge. It is necessary to be realistic and admit that formal teaching approaches within the educational processes are not based on such development of innate knowledge in learners. It can occasionally happen that transmitting external knowledge by the provider to the learner can create an unplanned learning situation where the learner recognises that externally acquired knowledge is linkable to their (more or less identified) innate knowledge. But again, even when this takes place, it happens totally by chance, because the teaching process does not presuppose by design to serve for further development of the innate knowledge of learners. Teaching styles, which would support such an inclusion, do not exist in principle within formal or non-formal educational environments. Various kinds of reality shows, first of all talent shows, and fashion talent shows, are designed in a direction that is the closest demonstration of the development of innate knowledge in participants. The participants in these shows approach the show with an assumption that their innate knowledge (in terms of talents) is clear to them, based on which they try to convince expert commissions and the public present that their innate knowledge deserves further development in the next steps of the shows. Two steps go on in these shows. The first is when the participant demonstrates their innate knowledge to these audiences. The second step comes after that, where different mentor-experts offer knowledge in the continuation of the show (about specifics in singing, behaviour, clothing, styling and performing) to chosen participants in further developing their innate knowledge (talents). These shows do not operate in terms of inclusive education

and inclusion. However, they are the best demonstration of how inclusion, based on the development of learners' innate knowledge, could look within educational environments. Speaking of the latter, music schools, for example, are one of the rare cases where the teaching process tries to include such development of innate knowledge in learners.

It is not surprising that this development of learners' innate knowledge often automatically refers to creativity linked to art. There is a common understanding that identifying this type of individual's knowledge is easier in artistic creativity (having a talent for singing, drawing, etc.). However, in the case of technical or mental creativity the situation is much more challenging, as identification of such innate knowledge within technical or mental creativity is much more difficult to define. That is why the first step of (dis)covering the learners' innate knowledge, which later needs further development, deserves more attention within this third, the most advanced level of inclusion of learners.

Positioning inclusive education and inclusion in the PWD context

Inclusive education and inclusion appear even more complex in the case of persons with disabilities (PWDs). This Is because inclusive education requires consideration under the doctrine within the current formula of three developmental steps, segregation–integration–inclusion (the international Convention on the Rights of Persons with Disabilities 2006). Understanding the concept of inclusion appears challenging and potentially misunderstood as it intertwines closely with the integration concept. That is why it is necessary to be aware of the different interpretations of what the term ‘inclusion’ can represent. Considering PWDs, the term inclusion matches with some additional meanings.

Additional type 1: Inclusion as being integrated into the education process

As the project addresses the issues of assistive and new technologies (AT, NT) to see how these technologies are helpful to PWDs, the term inclusion is usable for the development phases of integration. In this case, inclusion refers to the function of integration of PWDs into educational processes. Considering the doctrine of inclusive education and the term ‘inclusion’, it becomes clear in such cases that inclusion does not appear independently, which comes after integration, but only as a step in the integration concept. Put differently, in this respect the inclusion step is one step in the integration phase, which highlights how PWDs as learners are (can be) more easily integrated within a population made up of the remaining learners. So again, speaking about using the term ‘inclusion’, we must urgently be aware of whether we mean inclusion as a helpful tool for strengthening PWDs’ integration, or inclusion as the last development phase within the segregation-integration-inclusion formula. When inclusion is only a step within integration, it does not refer to circumstances (organisational, technical and spatial) under which persons with disabilities can more easily integrate into the educational process with other learners. It means that organisational, technical and spatial adjustments are specifics that appear as the responsibility of PWDs themselves. In short, although the term inclusion is used here, it is in reality only about the integration concept.

Additional type 2: Inclusion as an education process, based on teaching equality

The following meaning of inclusion goes one step further, and outlines the need of PWD learners to have equal access to the education process compared with other learners. It does this by pointing out that the teaching process, run by providers, is equal for all learners (PWDs and others), as it is based on the principle of equality, where all learners benefit from this equality. Put more concretely, all kinds of adjustments (organisational, technical, spatial) are the responsibility of the adult provider, based on which the teaching process suits all learners — persons with disabilities and others. By using the term inclusion, we refer to the achievement that PWDs are part of the education process by being treated equally to other learners. However, further questioning reveals what this equality for all learners means. It involves the equality of the same knowledge being transmitted to all learners by providers, pointing out again that persons with disabilities are given the chance to acquire the same knowledge under the same conditions (considering all necessary organisational, technical and spatial adjustments for them). In line with an educational process, transmitted knowledge requires verification by learners, based on which all learners are in the same position regarding how successful they are in understanding and mastering acquired knowledge (it is worth noting, though, that such evaluation and comparison of the knowledge in principle does not take place in non-formal adult education). Such an inclusion concept, regardless of its advocacy of equality, gives central attention in the teaching process to transmitting knowledge rather than to learners (either PWDs or others).

This principle of equality matches the first, the least ambitious level of inclusion (inclusion as promotion for more active inclusion of learners in the teaching process) that we saw in the previous chapter. The only difference or additional challenge, considering here also PWDs, is that efforts towards actively including learners in the teaching process also include adjustments because of PWDs). For the level of inclusion regarding including learners in the teaching process, significant attention goes to implementing individual work in the teaching process. Being attentive to the principle of individual work (URIHO), the latter assumes different kinds of teaching practices, as the emphasis is on learners' performance with or without minimal external help from the provider: while solving tasks in individual work, most often the whole class solves equal tasks, which are equal in difficulty; all steps taken by the learners are independent, supported by their research and information; the provider monitors the process of work, but is not directly involved in it; individual work builds and develops the learner's independence in task development, resourcefulness and creativity, and above all their responsibility for the learning outcome.

Additional type 3: Inclusion as a teaching process, based on learners' diversity

Further interpretation of inclusion has more ambitious expectations, as the knowledge transmitted by providers relates to a more tailormade approach to a learner (either a PWD or other). The central focus of the teaching process here is on the learners and their ability to set out their learning in a more self-regulated, self-directed, or self-determined way. Or, even more ambitiously, transmitted knowledge (by providers) serves for discovering and later developing innate knowledge in learners. Inclusion here refers to the ambition that a learner is part of the principle of diversity. The teaching process is (or should be) purposely designed on such a principle within which learners become the centre of the teaching process. This more advanced and ambitious inclusion coincides in terms of concept and content with the two types of inclusion from a previous chapter: Inclusion as a promotion of self-regulation, self-direction and self-definition in the learning process for learners, and inclusion as a promotion for the identification and development of innate knowledge in learners. These last levels of inclusion are matchable to a certain extent to the individualised approach within the teaching process. Referring to this individualised approach involves many teaching approaches (URIHO), as the provider respects and takes into account the personality of each learner; adjusts the tasks according to the learner's abilities, interests and needs, while accepting the learner's differences and possibilities; the provider enables all learners to successfully achieve learning outcomes by adapting the method of learning, appropriate tasks, as well as suitable individually adapted methods and content; the learner's provider triggers greater motivation for learning and educational activities, builds their self-confidence, and creates a more objective insight into the learner's abilities, knowledge, skills, and competencies.

To summarise all mentioned types and interpretations of inclusion within inclusive education, concretely related to adult (non-formal) education, we need to speak about inclusion in general and in the PWDs context, as seen in table 1 below:

TABLE 1:

INCLUSIVE EDUCATION	
Inclusion assumes BASIS that indicates that a learner is INCLUDED in the education process	
General context (*all learners*)	**PWD's context** (*PWDs vis-a-vis other learners*)
Types of inclusion	**Additional types of inclusion**
T1-Inclusion as developing more dynamic teaching process	AT1-Inclusion as being integrated into education process
	AT2-Inclusion as an education process, based on teaching equality
T2-Inclusion as a self (regulated, directed and determined) learning process at learners	AT3-Inclusion as a teaching process, based on learners' diversity
T3-Inclusion as identified and developed learners' innate knowledge	

As seen in the table, three types of inclusion on the general level refer to all learners, either to PWDs, or to the remainder of the learners. In this sense, all three types of inclusion (T1–T3) are connectable to all learners. The need for identifying the additional types of inclusion emerges because of the reality that the education conditions of persons with disabilities and other learners are not automatically comparable. As PWDs, learners do not face the same education conditions (under the formula of segregation–integration–inclusion); other types of inclusion are based on educational equality and diversity. Upon comparing both inclusion (general and PWD context) on a substantive level, we find that AT1 and AT2 directly relate to T1, while AT3, in the case of the true considering of the diversity principle, relates to T2 or potentially even to T3.

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Chapter 2:

Methods and Techniques for Teaching PWDs and Ensuring Their Access to Non-Formal Adult Education

Introduction

On the following pages, you will find a presentation of useful procedures and techniques, which, if you choose to apply them, you will be able to more successfully include persons with disabilities in your course, workshop or training.

Given that persons with disabilities are an extremely heterogeneous group of people, it is not possible to cover, predict and describe all the necessary procedures essential for inclusion. The goal of what follows is primarily to sensitise you to the needs of PWDs and to encourage you to think outside the usual framework. Some of the described applies only to persons with disabilities, but most of the methods and techniques are useful for all people and can be used to create an inclusive climate in the learning process.

In the first part, we will describe the accommodations for persons with disabilities, what they are for, and what you should pay attention to when creating them. Further on, we will describe the three main forms of accessibility, that is, accommodations: spatial, organisational and technical, through insightful perspective (the perspective of the education providers). This is followed by a larger section focused on the most accessible and one of the most effective tools for ensuring accessibility, which is communication. We talk about what communication is, what needs to be added to make it inclusive, and

we give tips for inclusive communication in the learning process. This is followed by the presentation of the 5-step path matrix, which would be useful to follow if you have the opportunity of including a person with a disability in your programme. The matrix consists of 5 steps, all steps are explained in detail and are not difficult to follow. In order to alert you to the specifics of certain groups of disabilities, there follows a section that gives a brief description of the phenomenology of categories of disabilities, and each one comes complete with a matrix in which only those features that are exclusively specific to that particular category of disability are highlighted. If you notice that some steps in the matrix are empty, don’t worry, we haven’t forgotten anything, but nothing specific needs to be highlighted here. However, the description from the universal matrix applies.

Accommodations

Accommodation is a tool with which we can prevent and remove barriers that could impede persons with disabilities from participating fully in education or any other life conditions. Accommodations should be done in a way that is responsive to each person's unique requirements and circumstances.

When talking about accommodations, there are three very important factors that we should take care of.

Those are: **dignity**, **individualisation** and **inclusion**.

Dignity

Persons with disabilities have the right to receive lifelong learning activities services in a way that is respectful of their dignity. Human dignity includes self-respect and self-worth. It is concerned with physical and psychological integrity and empowerment. It is violated when someone is marginalised, stigmatised, ignored or devalued. Protection of dignity should be a primary concern when shaping the accommodations in non-formal education providers' organisation.

You should have in mind that the attitudes of educators towards persons with disabilities have the biggest influence on how other learners treat and relate to learners with disabilities.

Your task as a trainer and learning facilitator should be to sensitise other learners to disability, and to model inclusive attitudes and behaviour towards learners with disabilities and the rest of the group likewise.

Individualised accommodation

The trouble is that there is no set, 100 per cent effective formula for accommodation. Each learner with a disability has unique needs and each of those needs must be considered afresh when we are shaping the accommodation that will serve for including that learner in our educational programme. At all times, the emphasis must be on the individual learner and not on the category of disability. Approaches to accommodation that rely solely on categories, labels and generalisations are outdated and in no way acceptable.

Although many accommodations will help large numbers of learners, in general, with similar needs, it is important that you always have in mind that an accommodation solution that you found suitable to meet the needs of one learner may not meet the needs of another. Two learners with the same disability are likely to have very different needs.

For example, while some people with visual impairments read Braille, many do not, and use other means of written expression.

Inclusion and full participation

Education providers should make efforts to in advance build or adapt when it is needed educational services to accommodate learners with disabilities in a way that promotes their inclusion and full participation. Preventing and removing barriers means all learners should be able to access their environment and face the same obligations and requirements with dignity and without obstacles. As an education provider, you should take any necessary steps to include learners with disabilities in your programme on an equal basis with other learners. The best strategy for this is to design inclusive programmes in a first place, with the needs of all potential learners in mind, so they do not exclude or single out any person regardless of their situation.

Here are some steps education providers can take to provide persons with disabilities with the opportunity to participate fully in educational services:

— STEP 1: Promoting inclusive design

To ensure that persons with disabilities have equal access to non-formal education, it must be structured and designed inclusively. This means education providers should be aware of both the differences between potential learners and differences that characterise groups of individuals. Then it is possible to design programmes, processes and services inclusively from the start. This approach is called ‘Universal design’.

All aspects of non-formal education, course curriculum, teaching methods and evaluation processes, should be designed inclusively from the outset.

This could mean using technology creatively, such as putting materials online, or selecting software compatible with screen readers. When courses are online, web-based or CD-based, questions of accessibility should be addressed in the development stage. When constructing new buildings, renovating old ones, purchasing new computer systems, launching new websites, designing courses, setting up programmes, services, policies and procedures, education providers should always have in mind principles of universal design. New barriers should never be created in the construction of new facilities or in the renovation of old ones. Rather, design plans should incorporate all guidelines and propositions regarding accessibility. Other than that, designers should also have in mind not just persons with disabilities but the different needs that people encounter at different life stages.

This approach is more effective because it is accessible and inclusive from the start. Barrier-free design is much more preferable to barrier removal, and it is consistent with the notion of disability as a social model.

— STEP 2: Removing barriers

Persons with disabilities currently face many obstacles in the education system, including physical, attitudinal and systemic barriers. Education providers should assess existing barriers and see how those can be removed. Whole group of learners should be included in that process. When you are faced with a challenging situation and limited resources, the best advice is to engage the whole group together with PWDs in creating a barrier-free environment. Perhaps you cannot build an elevator in a day, but you can try to move your classes to a ground floor.

— STEP 3: Accommodating remaining needs

Sometimes persons with disabilities have needs that cannot be met only through universal design or removing barriers. This usually means that they need the services or environment to have some features and characteristics specifically designed for specific difficulties arising from the disability. This is what we call accessibility. In the next part, spatial, organisational and technical accommodations will be presented through the perspective of the providers of non-formal adult education. The review will be given through a description of the challenges that education providers have experienced in their direct work, and a presentation of some solutions that have proven to be an effective response to these challenges.

Organisational accommodations

The Orient Express perspective

At its learning centre, Orient Express offers basic education courses for women with refugee or migration backgrounds. As many of the course learners have received no or only limited kinds of formal education, the focus lies on building capabilities such as reading, writing, German as a second language, numeracy and digital skills. Everyday course work at the learning centre thus comes with many challenges. The difficulties of learning a second language while having to learn reading, writing and a certain degree of digital competencies all at the same time, are manifold. Many barriers to learning furthermore stem from the specific learning disadvantages the learners face due to their multi-layered experiences of discrimination as migrant women, women, women of colour, Muslim women, mothers, elderly, educationally neglected, persons with learning disabilities.

The first communication challenge in our course work is an operational one: making sure that everyone understands the settings and framework of the courses can be difficult. This can include agreeing on the date of a class, availability of childcare, whether the course is held online or onsite, or making sure everyone receives, reads, or listens to organisational messages. Of course, this is also related to the main communication barrier: language. So, literacy, or a lack thereof, is a big obstacle to our course work. The learners are only beginning to learn German, while the course instructors are not fluent in their students' first tongues. When direct translations or interpretation by our multilingual team are available, communication is easier — however the learning effect might be slowed down when using direct translation too often.

Besides communicational barriers that come with learning a second language and acquiring basic literacy, the decisive aspect — leading to many communicational difficulties in our everyday course work — is the complex, intersectional situation of the learners due to the educational inequality they had and have faced and are still experiencing in their lives. Not only are they facing racism, sexism, ageism, ableism in their everyday lives, many of them are also dealing with the consequences of violence and trauma. These can have a severe effect on the brain, concentration, memory, endurance and learning capabilities. In this regard, the learning difficulties resulting from trauma might be the most relatable to learning disabilities. In everyday course work, these difficulties are mostly visible in an inability to concentrate or chronic tiredness. Some learners are heavily medicated, which is noticeable in severe changes of character or the inability to be mentally present.

Another dimension of communicational obstacles are the consequences of severe educational neglect experienced by our course learners during their lives. Many of the learners have never received any kind of education before. Thus, ‘learning to learn’ and autonomy in learning are indispensable components of our course portfolio. In that regard, a certain level of abstraction in task assignment also leads to communication difficulties. Besides that, a certain sense of self that had never been encouraged in many of the course learners represents another challenge leading to learning difficulties: if one has never learned that the practice of learning was something one could do, or was allowed to do, it is a major challenge to encourage the self-determination and confidence that is needed to set learning goals. A certain transfer capability to understand a learning step in order to focus on a future learning objective

poses another challenge. Trainers have to be able to break down every task into many little steps to not give too much information all at once. It might not help one of our course learners to identify a learning goal at the beginning of a course but instead the only way might be to develop it throughout the learning process, which might take a significant amount of time. Therefore, the general expectation of providing the space for the learners to receive participative, emancipatory and self-determined adult education would be the ideal but it presents a number of challenges.

One of the major difficulties in identifying their learning obstacles is differentiating between cognitive impairments and severe educational neglect in their life stories. Finding solutions/educational models to aid their difficulties might be similar but identifying the roots of the disadvantage is a different story. Moreover, some of our course learners do have physical disabilities that make it even harder for them to learn, such as hearing or visual impairments, or the long-term effects of injuries. When dealing with these kinds of physical challenges, many learners find that seeking medical support is a further challenge due to the language barrier. Technical difficulties, e. g. with hearing aids, complicate the matter. Therefore, the individual needs of each course learner must be taken into account in the course design. Course instructors must be as flexible as possible in the classroom in order to react to the variety of capabilities and learning needs. Consequently, one of the greatest challenges for our basic education provision is making courses more accessible to learners affected by trauma, violence and neglect.

Spatial accommodations

IDEC perspective

Spatial accessibility plays an important role when it comes to education. However, one common challenge that persons with disabilities experience is that they face many difficulties when it comes to spatial accessibility in educational settings. Unfortunately, most of these settings are not properly designed for these individuals, and so they tend to be excluded or they may drop out of education altogether.

— Challenges related to the outdoor areas

Regarding the issues that are related to the outdoor areas of educational establishments, it is reported that many of these establishments do not possess a large number of facilities that are friendly to persons with disabilities, or they are not in a good condition, as most of these buildings are old and not adapted to the needs of PWDs. One indicative example is that some educational institutions do not have many parking spaces for persons with disabilities. Another problem is that many institutions lack the means that facilitate the mobility of students with disabilities, such as lifts, walking frames or ramps; this makes the movement of disabled people around the institutional premises more difficult, as it takes more time. Another challenge is that it is often observed that the floors of the institutions are messy, and the clutter can prevent these individuals from moving around freely on account of their movement being hampered. It is also noted that many of the training materials are placed in positions that persons with disabilities

cannot reach easily (for example, the books in a library are placed on the upper shelves). In addition, the toilets that are specially designed for PWDs are not available in many of these institutions. Last but not least, educational settings do not have special staff who can guide blind people inside the building and, most importantly, there is no escape plan for these individuals in case of emergency. This is a very serious issue since these individuals find it difficult to attend educational institutions.

— Challenges related to the classes

Concerning the issues related to the spatial accessibility in the classes of educational establishments, we note the same challenges. First of all, there are no specific support staff to accommodate these individuals. Classes do not have open spaces between the desks and the doors and that makes it even more difficult for persons with disabilities to easily access all areas of the classroom. Furthermore, some classes are not conducted in a hybrid way (with both a physical and remote presence), making it challenging for persons who cannot attend classes physically, and so they are left behind in lessons compared to their fellow students.

— Recommendations

In recent years, attention has been drawn to inclusive settings in educational institutions as more and more disabled people attend them.

One solution that is provided for students with disabilities is their placement in schools specially designed for disabled people. Another good example is the recording of the number of hours per week that students with special needs participate in their classes in a mainstream school. Some schools also invest in cooperative teaching, differentiated instruction and individualised support. In addition, they create additional rooms in order to enable teachers to flexibly create open learning settings.

A concrete example of the reinforcement of the spatial accessibility of educational institutions is the Spatial Accessibility Manual for Schools, which is published by the Ministry of Education together with the Federal University of Santa Catarina (Greece). This manual aims to support the education systems in the implementation of a public policy to promote accessibility in schools and universities for persons with disabilities by providing flexible environments that are easily accessible to students with disabilities.

Regarding the classrooms, it is proposed that there should be a circulation area that allows the 360° rotation of the wheelchairs and that whiteboards be installed at a height of 90cm from the floor. Furthermore, it is recommended that chairs be installed at a height of 73cm from the floor. Last but not least, the furniture should be placed in positions that are not near the moving spaces, and which are easily accessible. In particular, it should have a minimum headroom of at least 73cm from the floor.

Technical accommodations

Topcoach perspective

We use different technologies in our work to make our services as attractive as possible. But when we create our educational content, we primarily start from the position of what is currently modern and what will be attractive to as many people as possible. We rarely think about the fact that there are people who won't even be able to experience our valuable content because it's not in accessible formats. Although it is the 21st century and technologies are ubiquitous, we often use them in conventional ways and are not even aware of all the ways we can use them to make our educational content accessible to an even wider group of potential learners. Usually, when we have the opportunity to teach a person with some form of disability, we first think of some special, expensive, specially designed technologies, which are available only to those specific people. We often forget when creating educational content that we can think about accessibility for everyone right from the start. What we try to incorporate during our training is the use of live and remote participation. Also, when creating printed materials, we try to follow the rules for people with dyslexia and dysgraphia. We often record our lectures and workshops and allow learners to watch the recordings in peace and quiet later and, additionally, to concentrate on the important parts. We believe that this is useful both for those with attention problems and for anyone who, for whatever reason, is not able to maintain attention, take notes and listen to content at the same time. We are also thinking about the possibility of using subtitles in our video content, which would make them accessible

to the hearing impaired. We know that visually impaired people use a variety of screen readers and that there are opportunities to use some digital formats. We are happy to share all the digital materials we have with students with visual impairments. Our materials are not designed with the idea that they will be used by blind or partially sighted people, and we will certainly ask for feedback from students with visual impairments on the level of accessibility of our materials at the next opportunity.

Communication — Most accessible accommodation

It is impossible not to communicate. Our every behavioural act — a word, gesture or silence — sends a message, i.e., it communicates.

Considering that we do this constantly, it is logical to conclude that the first step towards the inclusion of persons with disabilities in informal adult education is inclusive communication.

Before we can define inclusive communication, however, it is good to explore what communication is. Communication denotes the many ways that we exchange information with others. We divide communication into verbal and non-verbal communication.

Verbal communication is any communication that involves words. It can be spoken communication such as telephone calls, presentations or conversations, or written communication such as reports, adverts, emails, letters and texts.

Non-verbal communication is any communication that does not use words. It includes:

— Visuals such as photography, illustrations and emojis.
— Body language, facial expressions and gestures.
— The ‘way’ in which we say things — volume, pitch, tone and inflection (paraverbal communication).

When communicating, you should have in mind these questions:

— What information are you planning to share?
— With whom are you planning to share it?
— What are the objectives of your communication?

Inclusive communication is a way of transmitting information that does not intentionally or accidentally exclude a single person and is accessible to everyone.

Central to promoting inclusive communication is acknowledging that people have different communication preferences and needs — all of which should be respected.

Finding ways to embrace everyone's communication styles and needs can make everyone feel like they're being heard. It also transfers the message that it is important that each of us has an equal right to access information. Furthermore, inclusive communication must not contain any discriminatory messages regarding any physical, mental or metaphysical feature of any person, but especially the following:

— age
— disability
— gender reassignment
— marriage or civil partnership
— pregnancy and maternity
— race
— religion or belief
— sex
— sexual orientation

How can you promote inclusive communication?

— Be aware

The first step towards inclusive communication is to be aware of possible barriers. And the first place we should look for those is in our heads.

Start by considering unconscious bias — these are values and opinions formed unconsciously through many different influences in our lives — background, media, etc.

— Get to know your audience

We all adapt our communication style and methods depending on who we are communicating with, and our relationship to them. Think of a simple greeting. The words, tone and any accompanying gesture you use will differ significantly when greeting your boss, a new client, your sibling or your learners.

Although we are aiming to give you tips and tricks to embed a culture of inclusive communication in your organisation, it is also important that you adapt to any specific needs of the people you are seeking to communicate with. And in order to know how to adapt, you have to get to know your learners. The best way to get to know people is by asking them questions.

Steps to ask questions:

— Think about what you already know.
— Be direct.
— Ensure simplicity.
— Confirm what you want to learn.
— Listen more, talk less and be comfortable with silence.
— Ask follow-up questions.
— Ask for clarification.
— Do not be afraid to ask what others deem to be ‘stupid’ questions.

— Inclusive language

Striving to use inclusive language means avoiding any terms that could reinforce stereotypes or unintentionally discriminate. This applies to both written and spoken communication. Some ways you can do this include:

- Avoid gendered language — such as ‘the guys’, ‘chairman’.
- Do not assume a binary view when referring to gender — so, rather than using terms such as ‘both genders’ you should refer to ‘all genders’.
- Ask people what their preferred gender pronouns are — and respect them. Alongside binary gender pronouns, he or she, many people prefer the non-binary pronouns they or ze.
- Familiarise yourself with the correct way of addressing persons with disabilities.
- When you talk about a person, you don’t talk about their identity, but about their behaviour or characteristics, for example ‘Tina is loud’. It is better to say ‘Tina often speaks loudly’. Instead of ‘Marko is hard of hearing,’ it is better to say ‘Marko has a hearing impairment’.
- It would be a good idea to remove from your speech jokes about any characteristics related to gender, race, religion, disability, physical characteristics or any other characteristics that could facilitate unpleasant feelings.

If you have any doubts regarding how a person would like to be described, ask them. This shows consideration and will avoid unintentionally offending someone.

Inclusion is not a method we apply to certain groups in society. Inclusion is a way of organising and an atmosphere in the collective. Therefore, it is important that you always organise your activities in an inclusive way, regardless of whether persons with disabilities will join you in them. As an adult education provider or trainer you have responsibility for promoting inclusive communication styles.

First of all, it is important that you set out clear learning outcomes and create a welcoming and open culture in your organisation. In addition to that, it is also important that you engage with your learners and get regular feedback relating to inclusion. This helps to make you aware of any concerns they may have and enables you to take steps to address them.

Here some things that you can consider while shaping different phases of your training:

Qualification process

— Make documentation and information about your programme available in a variety of accessible formats like editable PDFs — including in English and Braille.
— Make sure written information is clear, concise, accurate and, where possible, supported by visuals.
— Offer alternatives to traditional interviews and onsite participation. Video interviews, pre-recorded presentations or trial days can sometimes support those who have communication differences.
— Ask potential learners if they require any specific adjustments — such as an interpreter.

Lessons

— Allow learners to choose how they attend — in person or remotely.
— If interaction like comments and questions is invited, allow these to be submitted in a variety of ways (verbally, written, etc).
— Make sure the venue is accessible — consider any visual, auditory and other sensory implications.

Presenting

— Provide a sign language or foreign language interpreter.
— Record the presentation so people can access it later and repeatedly if they wish to.
— Make sure printed material is available alongside an on-screen presentation.
— Provide material in other formats and translated material if needed.
— Be mindful of any social interaction expectations that might be challenging for some learners.

Strategies for cultivating an inclusive mindset

— Practice empathy

Empathy is the ability to imagine yourself in the situation experienced by another human being and thus better understand other people's feelings, behaviours and opinions.

There are two good strategies for this:

Walking in someone else's shoes — That is, you learn to empathise with the person through imagining what it's like for them.

Imagining yourself in the same circumstances — You think about how it would be for you if you were in the same situation the other person is in and through your own experience you connect with that person.

Practicing empathy for others will help you to establish more effective relationships. By trying to see things from others' perspectives, you are more likely to recognise when communication might not be inclusive. When we understand somebody better, we can communicate with them more effectively. This results in greater clarity, enriched relationships, increased productivity and improved well-being for all.

— Practice active listening

Active listening can help you develop empathy and is a key communication skill. It involves really concentrating on what the other person is trying to communicate — without focusing on what you want to say next or bringing any judgment or preconceived opinions.

There are two good strategies for this:

Reflecting

Reflecting can help us clarify exactly what our learner said. Reflecting is done in such a way that we listen carefully to what the learner tells us, and in addition to the content itself, we empathically connect with the feelings. We say it out loud and check with the learner whether we have understood correctly.

This is the best way to avoid misunderstandings. But it also helps to show that we really care about understanding and that everything the learner wants to share is important to us.

Paraphrasing

Paraphrasing is a very useful technique that can help us make sense of what our learner is saying. Sometimes it is difficult for our learners to clearly express what they want to convey to us. Paraphrase in such a way that you extract the meaning from the words that were being said, say it out loud in your own words and check with the learner if this is what was supposed to be conveyed.

In addition to being components of active listening, these are also the main tools for showing empathy.

— Adopt a growth mindset

There is always something new to learn about. You can even grow through mistakes if you are ready to put some effort into learning better ways.

Communication does not stand still; it is fluid and it develops. Adopting a growth mindset will allow you to be a better person each day.

Universally useful tips for inclusive teaching

No matter who your learners are, inclusive teaching is a method to help everybody become more successful learners.

The following tips can help you to communicate in a more inclusive way while teaching:

— Look and speak directly to the learner, rather than to their aide or parent. When speaking to a group, face your learners and try not to put your hands in front of your face.

— Speak slowly and clearly and try to use shorter sentences. Ask your learners to tell you if you are speaking too quickly for them.

— Turn down, or off, any background noise or music. Make sure that only one person speaks at a time during discussions.

— Some learners with learning disabilities, those from different backgrounds, can misunderstand tone of voice, facial expression and gestures. Individuals who are learning languages might also come from different cultures where a gesture has a different meaning. Use words to reinforce your body language when you need the class to know how you feel.

— Read information aloud that is presented visually. Give both oral and written instructions.

— Use pictures, objects, kinaesthetic activities and other methods of teaching that engage all of the senses.

— Use the same phrase, tone of voice and gesture to let your learners know that something is particularly important.

— Suggest that learners record audio of your classes. It can be helpful for many learners with language difficulties to listen to the words several times.

— Be patient and allow enough time for learners to understand what you've said and work out how to answer, as well as giving them enough time to finish their sentences.

— Be flexible — if one communication technique doesn't work, try another.

Communication is most often omnipotent, as long as it exists, miracles can happen. Be creative and relax. There are many ways to send a single message, have fun exploring the possibilities.

What follows is a presentation of the universal matrix, as a 5-step path that will facilitate the inclusion of persons with disabilities in your learning process. You will notice that, when traveling through the matrix, open and clear communication is the key to success.

The five-step path to the inclusion of persons with disabilities in non-formal adult education

Universal matrix

1. Information gathering

1.1. About the disability
1.2. About the person
1.3. About the accommodation

2. Selection of the accommodation

2.1. Utility criterion
2.2. Economy criterion
2.3. Purpose criterion
2.4. Sustainability criterion

3. Application of the selected accommodation

4. Checking the functionality of the accommodation

4.1. Utility criterion
4.2. Economy criterion
4.3. Purpose criterion
4.4. Sustainability criterion

5. Making a decision about the functionality of the adaptation

1. Information gathering

(The process of obtaining relevant information with the aim of getting to know the potential learner and selecting a functional accommodation. The information that is collected is focused on the four categories described below)

The first step in following the universal matrix, by which we select a specific accommodation for a specific person with specific difficulties, is to gather information. It is necessary to try to find out as much as possible about the topics that can help us predict the success of the educational programme. This means that everything related to the conducting of the programme should be carefully investigated and then analysed. The aim is to check to what extent it will affect the successful implementation of the programme and meeting the learning outcomes.

1.1. About the disability
(Collecting information about the type and degree of difficulty resulting from the disability)

Sources of information: the individual and their documentation, accompanying persons, professional literature, association or other body/official whose core activity is precisely that impairment.

In order to adequately include a person in the educational process, it is important to find out what their difficulties are. The most important source of information and what we should always start from is the individual themself. The emphasis is on open and pleasant communication in which both parties have space to share everything they consider important for cooperation. Sometimes a person will offer a specific diagnosis, and sometimes they will just describe the nature of their challenges. It is your mutual responsibility to consider to what extent the difficulties described will affect the success of their attending the educational programme. Sometimes PWDs are accompanied by other people, who can serve as a relevant source of information. In doing so, it is important to make any communication with the assistant transparent to the person interested in education. Exceptionally, we can get information from official documentation, but we must not demand insight into it if the individual in question does not offer it. Sometimes the individual will offer documentation for inspection in order to make it easier to understand their condition, in which case you are free to study it.

Also, it is advisable to explore additional sources of information. There is a lot of informative content available on the internet that offers professional information in a simple and practical format.

In most major cities there are associations and alliances that bring together people with similar difficulties. Such organisations often have various resources that can make it easier for you to include a person with a disability in your educational programme.

1.2. About the person
(Collecting information about the relevant characteristics of the individual in terms of personality traits, preferences, other health conditions, needs and ways to satisfy their requirements during the educational programme)

Sources of information: the individual and their documentation, other relevant persons with their consent.

It is important to get to know the individual and their most important personal characteristics, that is, to be informed about the ways in which they cope with the challenges they face. It should be emphasised here that we have the right to find out only the information necessary to facilitate their inclusion in the educational process, without intruding into the person's privacy. The individual concerned has the right to refuse to discuss these topics, however, the education provider in that case has the right not to include them in the educational process.

1.3. About the accommodation
(Collecting information about common accommodations with regard to the identified difficulty and specific accommodations in relation to the individual concerned)

Sources of information: the individual, professional literature, association or other body/official whose core activity is precisely this impairment.

Here, it is useful to find out in which ways specific difficulties are usually compensated for in the education process. There are already adapted and tested teaching methods and techniques for specific difficulties, and today there are many developed assistive technologies. It's important to emphasise that you don't have to become an expert on a particular difficulty, but rather be curious and creative about using all the available resources to get the person involved in your programme. In this phase, the importance of direct and clear communication and space for the exchange of ideas is emphasised again. Often the individual concerned will already have a proposal for the necessary accommodations. As a source of additional ideas and practical help, contact organisations and experts with whom you have already established contact.

2. Selection of accommodation
(The process by which the previously collected information is analysed predicts the compatibility of the potential accommodation with the environment and the nature of the non-formal education process. The aim is to make decisions about the accommodation to be applied)

The elements by which the adequacy of the potential accommodation is assessed include the following:

2.1. Is the potential accommodation useful for the individual (the potential learner)? —
Utility criterion

Although some accommodations are standard and usually linked to a particular difficulty, this still does not mean that they will suit our potential learner. This implies that our potential learner knows how to utilise the offered accommodations functionally and apply them practically in the educational process.

2.2. Is the potential accommodation reasonable for non-formal education providers to apply? —
Economy criterion

Here it is important to determine to what extent the difference between stakes and profits is acceptable. While we all have the right to participate in lifelong learning, it is important to remember that ensuring accommodation should not compromise the integrity of either party. If the chosen accommodation met the criteria of usefulness, but its implementation exceeds the resources of both providers and learners, it is necessary to look for another accommodation. If you have not been able to find a satisfactory alternative accommodation, it is correct not to include the learner in education. In this way, you protect the person and maintain the standards of your own service.

2.3. Does the potential accommodation contribute to learning outcomes? — *Purpose criterion*

The success of each educational program is measured through the fulfilment of predefined learning outcomes. Therefore, after completing the programme with reasonable accommodation, every PWD must be able to meet all learning outcomes as well as those learners without disabilities. This means that any accommodations we decide to apply must be with the aim of achieving learning outcomes. For example, blind people use a computer with a screen reader in most educational processes, but you conduct a course on making ceramic objects. We can conclude that your potential learner who is blind knows how to use such a computer and you own a computer on which you can install a free screen reader, but essentially a computer with screen reader will not ensure that a blind person can easily master the making of ceramic objects. Accordingly, it is not a purposeful accommodation, and we will not apply it.

2.4. Is the potential accommodation sustainable for the duration of the education? — *Sustainability criterion*

If we have found an accommodation that is useful, economical and purposeful, it is very important that it is such that it can be implemented throughout the duration of education. It is very important that, when offering the possibility of accommodation, we realistically assess our organisational capacities and offer only what we can realise every time a person participates in education. For example, a hearing-impaired person who only uses sign language wants to join your sewing course. You agreed because there is a lady in the group who uses sign language perfectly and has agreed to be a volunteer sign language interpreter. But occasionally that lady misses the course, and in those situations the person with hearing loss does not have an interpreter, does not understand the content and does not participate in group dynamics. So, although this kind of accommodation is useful, economical and purposeful, it is not sustainable, and an alternative solution should be found.

3. Application of the selected accommodation

(Implementation of the selected accommodation in a real environment)

When you have found an accommodation that meets all the criteria, you are ready to include a person with a disability in your educational programme.

It is important to note here that the designed accommodation works only in theory, and that now practical application and verification in real circumstances will follow. There is a high probability, if we have completed the previous steps with care, that in practice everything will go as we imagined. However, one should keep in mind the large number of unpredictable circumstances that can have an impact on the final outcome.

4. Checking the functionality of the accommodation

(Gathering information about how the accommodation implemented works in a real environment)

It is important to keep in mind that the chosen accommodation will only be functional within the circumstances on the basis of which we choose it. Any change in circumstances in relation to the situation we considered when choosing an accommodation requires a return to step no. 2.

In order to maintain the functionality of the accommodation, it is important to continuously check during the educational process whether the accommodation implemented still meets all four criteria. The criteria mentioned not only ensure the person with a disability can be included, but also the equalisation of opportunities for all students of education. Compromising on any of the criteria calls into question the idea of inclusiveness for the entire group of learners. You can collect information relevant to the assessment of functionality through talking to all learners and observing the educational process.

The listed criteria are as follows:

4.1. Is the potential adaptation useful for the person (the potential learner)? —
Utility criterion

4.2. Is the potential adaptation reasonable for non-formal education providers to apply? —
Economy criterion

4.3. Does the potential adaptation contribute to learning outcomes? —
Purpose criterion

4.4. Is the potential adaptation sustainable for the duration of the education? —
Sustainability criterion

5. Making a decision on the functionality of the accommodation
(Analysis of the information collected with regard to the relevant criteria and making a decision on the continuation of the application of the applied accommodation)

If it is determined that the application is functional in all elements, the recommendation is to continue it. If it is determined that the application is deficient according to one or more criteria, it is indicated to return to step no. 1 and the re-sequencing of the universal matrix.

This is a description of the steps that could be applied to every student of any training. Although not everyone has a disability, they might have other specificities, and true inclusion is when all differences are welcomed and are used to enrich the common experience.

In the next part, we will give a description of the phenomenology of disability categories, and we will highlight some specifics in relation to following the matrix.

Phenomenology of disabilities in non-formal adult education

Hearing impairment

Hearing impairment is usually said to be a hidden disability because the problems associated with it are not easily visible to hearing people and many people have never met a deaf person.

A child with a hearing impairment cannot learn spoken language through incidental learning. They cannot casually eavesdrop on what the environment is saying and, since the large amount of information that a child learns is not directed at them, a child with a hearing impairment will miss a large amount of the information every day. When it comes to incidental learning, children learn as much as 90% through proper hearing, while only 10% of information comes to them through direct teaching. Because of this, children with hearing loss miss out on practical knowledge for progress in school and the community and consequently have a limited pool of information, so a greater effort is needed to achieve greater information. They need to be taught directly many of the skills that hearing children learn along the way. This problem does not occur in deaf children of deaf parents who naturally and spontaneously acquire sign language as their first language and can ‘eavesdrop’ visually.

There are several systems for classifying people who have hearing difficulties. One method is audiological classification, which classifies an individual based on their degree of hearing loss (i.e., minimal, mild, moderate, moderate to severe, severe and profound). This classification system does not provide an objective representation of the severity of a person's hearing loss, that is, it does not provide information about a person's daily functioning.

The second system is based on functional classification. According to this classification system, people who have hearing loss fall into three main subgroups: (1) those who are hard of hearing; (2) those who are deaf and became deaf in adulthood; (3) and those who were born deaf or who became deaf early in life. Although these three subgroups share hearing impairment, they have a number of different characteristics, needs, desires and ways of communicating. True (clinical) deafness, which does not imply residual hearing in any form, is extremely rare.

Deaf people are people who, in practical terms, cannot use their hearing in spoken communication, even with sound amplification via a hearing aid.

Deaf people are people who have completely lost their hearing after learning to speak in a normal way, especially those who became deaf in adulthood, due to illness or accident.

People who are hard of hearing are those who gradually lose their hearing due to age (senile deafness, presbycusis).

People who are hard of hearing are those who, with the help of a hearing aid, perceive the speech of another person by listening. For them, the ability to hear depends on the specifics of the situation. A person can communicate and understand very well if they are in a meeting, in a one-on-one situation in a quiet and well-lit room without glare, and when feeling rested. The same person may have great difficulty understanding during a group meeting or training session when several people are talking, where there is background noise (e.g. air conditioning, ventilation systems that are noisy), when the speaker is standing or sitting at a distance, etc.

The population of deaf people is quite diverse thanks to numerous factors that have the greatest impact on educational achievements, due to the specificity of receiving and giving information and understanding it: degree of hearing impairment; time and cause of hearing impairment, i.e. early diagnosis and early intervention; the hearing status of the parents, i.e. the modality of communication in the family; adequate support within the family; support at school and in the wider social environment; intellectual status; the presence of some additional impairments; personality, etc. That is why it is important to approach each person individually, without pre-set prejudices related to deafness.

Accommodations in educational environment

— Organisational accommodations

Always face the person you are addressing so that the deaf person can see and read you (in front of or next to the person). Your face should be at eye level of the deaf/hard of hearing person. The most important thing is establishing eye contact. So, look the person in the face and don't start talking before the deaf person has fixed their gaze on you. Namely, deaf people 'listen' with their sight. It may happen that you, while the deaf person is speaking to you, direct your gaze to the other side, and they immediately stop speaking. For a deaf person, there is no conversation without looking. If you are speaking to a deaf person using a sign language interpreter, look and speak directly to the deaf person, not the interpreter. You communicate with your learner, and the learner with the interpreter.

Avoid turning your back, bowing your head or covering your mouth, as well as chewing gum or food while teaching., Minimise walking around the classroom. Be careful not to stand in front of direct light (e.g. in front of a window), because your face will be in shadow.

Lip reading is easier when the context of what is being said is known, so provide them with pre-written materials, instructions or information whenever possible. Provide a copy of the material to the sign language interpreter so that they can prepare in advance for all translation situations in terms of content and language — terminology, because the interpreter may not be an expert in your educational subject, and some words cannot be represented in sign language, so the interpreter will have to find a substitute word/sign. It is important that you use standard speech and not a dialect, because language is deficient for a deaf person anyway. Speak clearly and in simple words, avoiding long sentences or numerous

dependent clauses, as well as double negatives and words with double meanings, as this can cause confusion. Avoid passive constructions. The above also applies to tests. Write new technical terms or foreign names on the board. Speak at a moderate speed, without overemphasising the words when pronouncing them. Do not make excessive grimaces — be natural and use simple gestures. Do not shout, because this emphasises the vowels and does not allow for better understanding (it also distorts the movements of the lips), and the deaf person may think that you are angry, which can increase stress.

During the demonstration, it is necessary to first show and then give interpretation and advice. Be prepared to insert subtitles into the video so that even deaf learners can follow them if there is no interpreter present. Deaf people's concentration drops towards the end of the day (due to the increased fatigue of lip reading), so it is desirable to provide enough time for relaxation or occasional breaks.

When calling names during training, get the deaf person's attention by gently patting them on the shoulder — never do it suddenly or come from behind. Call the hard-of-hearing student loudly. Make sure that the deaf person participates in everything that happens in the classroom, which they might not notice on their own. During a group discussion, give the deaf person a visual cue as to who is entering the conversation. Hearing-impaired people are not immediately aware of who is speaking, so they may miss the first part of what the speaker is saying. Warn the people in the discussion to speak in order, one after the other. If there is an interpreter in the room, slow down the pace of the conversation so that the interpreter can convey everything they are saying to the deaf person.

It is important to be sensitive to the self-esteem of the deaf learner and to ensure an inclusive environment, so avoid messages such as ‘I’ll talk later’ (‘later’ rarely comes), ‘oh, it doesn’t matter’ (it doesn’t matter to you), ‘it doesn’t matter’ (which means ‘I won’t try to include you’), etc., because it affects the self-esteem of the deaf learner.

Check written and oral comprehension. Let the deaf learner know that it’s okay to ask for anything they don’t understand to be repeated or clarified, and more than once if necessary. Monitor the non-verbal communication. Be sensitive to the lack of opportunities for incidental/random learning. Presenting pictures and words in a written format on the board also facilitates learning.

Keep in mind that deaf and hard of hearing students need more time to linguistically process what is said (they need time to think about what is said), i.e. to read, understand and absorb written information because they may misunderstand or interpret written information.

— Spatial accommodation

Your face should be well lit, facing the light source. Keep your head still. The further away you are from the deaf person and their hearing aid, the harder it is to understand speech, so maintain an optimal distance of 1 to 1.5 metres. Another obstacle to understanding speech is reverberation or echo. Using decorative styrofoam ceiling panels, carpeting small areas and placing rubber noise protectors on chair and table legs will improve the acoustic conditions. Understanding speech is difficult where there is loud noise in the classroom, so place the deaf person as far as possible from the source of noise, for example from the air conditioner and other devices that produce noise (computers). Background noise can also be reduced by keeping plants in the room, turning off background music or the radio, and closing windows and doors.

In addition, seating position is important for hearing-impaired people. Allow them to choose a place that means they do not have their backs to the door, so they are able to visually perceive the whole group and the people approaching them. Organise a circular or semi-circular seating arrangement to make it easier for the deaf learner to clearly see everyone's faces (both the interpreter and you as the primary speaker). Have a deaf person sit next to you so they can understand you better. In the case of a classic classroom, place the deaf person at the first or second desk. If a person has one-sided hearing loss, they should sit in such a way that their hearing ear is facing the speaker, not the wall or window. Keep sight lines clear. Remove tall centrepieces and anything that blocks the view, such as computers. Diffuse room lighting is very important for hearing-impaired people, since they often read from their lips, and this is not possible in the dark.

— Technical accommodations

Assistive technology can be a key factor that enables deaf people to participate in the activities of everyday life and be included in society through the educational process.

For the hearing impaired, use different telecommunications channels to ensure that a sign language interpreter is present if needed.

If possible, provide a laptop for a fast typist who will sit next to the hearing-impaired person and write down on the display everything that is said during the training, if the deaf person does not know sign language.

During the educational process, enable the frequent use of visual elements such as a whiteboard, map, picture, diagram, PowerPoint, overhead projector, projector and brochure.

Enable the use of different technologies for wireless sound transmission that amplify the sound field in the classroom for hard-of-hearing people and, at the same time, limit the impact of noise and the distance from the lecturer, if they use a hearing aid: frequency modulation system (FM-system), infrared system — IC (IR-Infrared System), an audio frequency induction loop system (AFILS — Audio Frequency Induction Loop System) that removes background noise. If the hearing-impaired learner uses the FM system, encourage other learners and guest speakers to use the FM microphone.

Enable platforms that enable the provision of subtitles, for example Zoom or Microsoft Teams while others translate the verbal record into writing in real time (for example Google Hangout Meet), so that even a person with hearing loss can participate in video meetings.

Matrix

1. Information gathering

1.1. About the disability

Although the most common classification of hearing impairment is deafness and being hard of hearing, it is important to remember that it is more theoretical than practical. Hearing impairments are extremely heterogeneous, and the hearing perception of an individual person is determined by a multitude of both individual and environmental factors. Therefore, it is important that the focus of your research is the specifics of your potential learner's impairment.

1.2. About the person

Communication with people with hearing loss may require exceptional communication flexibility. There are great differences from person to person in preferred communication channels. Thus, some people with hearing loss use speech and do not sign, some only sign, while others only use lip reading, and some use all of the above. For those who use speech, it can be different to usual, and language expression is often poor. Paraverbal communication in people with hearing impairment (tone, pitch, volume of speech) does not have to reflect the emotional state and the transmitter of the message, but it can be about an inability to control the voice. In view of the communication barriers, the importance of continuous checking of understanding is extremely important. It is necessary to check whether the person with hearing loss understood you, but also vice versa, whether you also understood what they wanted to communicate to you. The written expression of people with hearing loss can be agrammatic and not follow linguistic norms, it is important to keep in mind that this may be the result of hearing loss and lack of rehabilitation, and that this may not necessarily be a sign of lower intellectual abilities or general education.

1.3. About accommodations

Accommodations in the context of lifelong learning for people with hearing impairment are most often related to communication. It could be useful to establish cooperation with providers of communication mediation services for people with hearing impairment (transcription, sign interpretation). Even if you successfully communicate with a hearing-impaired person who uses hearing aids — artificial cochlea, hearing aid, inductive loop — it is still important to remember that these devices do not replace the ear, and that your auditory perception and that of the other person is not the same. It is still important to communicate carefully and check the flow of the communication channel. A sign language is a foreign language if it is not learned from birth and as a primary language. Therefore, the functionality and expediency of using sign language in education primarily depends on the skill and training of the interpreter and the skill and training of the hearing-impaired person. Lip reading can be a useful tool for communicating with hearing-impaired people, but it is also a very unreliable method.

2. Selection of accommodation

2.1. Utility criterion

The criterion of usefulness for people with hearing impairment is primarily conditioned by the person's pre-existing communication preferences, and thus the capacity for creating new accommodations is narrowed.

2.2. Economy criterion

You as an education provider can network with providers of communication mediation for the hearing impaired. The services of communication intermediaries are often free at the request of a person with hearing impairment.

2.3. Purpose criterion

People with hearing impairment have the right to all available information, that is, we must not take it upon ourselves to decide what they will find out and what they will not. Even if it is not necessary for the achievement of learning outcomes, the possibility for multidirectional equal communication between the education provider, the person with hearing impairment and other learners must be enabled.

2.4. Sustainability criterion

3. Application of the selected accommodation

4. Checking the functionality of the accommodation

4.1. Utility criterion
4.2. Economy criterion
4.3. Purpose criterion
4.4. Sustainability criterion

Here, special attention should be paid to the real reliability and effectiveness of the implemented accommodations (both devices and strategies) due to the existence of objective shortcomings of all of the above.

5. Making a decision about the functionality of the adaptation

Visual impairment

Sight is the sense by which a person collects information from the environment through the eye. Visual impairment includes any condition that interferes with the interpretation of what is in our environment based on visual information. The main characteristics of visual perception are sharpness and width of the visual field. This heterogeneity of aspects with which we determine the functionality of vision should be kept in mind when acquiring an idea of what visual impairment actually is and creating expectations for a person with visual impairment. Visual impairment is divided into low vision and blindness. Roughly speaking, the main difference between the previously mentioned types of visual impairment is that, in the case of low vision, corrective glasses increase the usefulness of vision, while in the case of blindness, they have no significant effect. However, such a division is of a theoretical nature and ignores a number of complex eye conditions and diseases that affect the functionality of vision in a very specific way. Therefore, in contact with visually impaired people, it is important to be aware of the variability of residual vision and the possibility of using these residuals, both quantitatively and qualitatively. It is a common misconception that blind people experience greater difficulties in everyday functioning compared to the visually impaired. However, it is true that, on average, visually impaired people more often lack participation in adequate rehabilitation and find themselves in a grey zone in terms of belonging (sighted or blind), and thus the formation of a complete identity. The most common difficulties that a person experiences as a result of visual impairment are found in the ability to navigate independently in space. This is especially noticeable if the person is in a new environment that they did not have the opportunity to explore before. Furthermore, in an educational context, a person with visual impairment will most likely manifest difficulties when consuming educational materials presented in the usual way. Here, it is necessary to be aware of other sensitive channels through which the content can be transmitted, and to devise functional strategies compatible with the educational programme itself.

Accommodations in educational environment

— Organisational accommodations

In order to attract people with visual impairments to participate in your education programme in the first place, it is important that your marketing is also inclusive. Make sure your website complies with digital accessibility guidelines. Also, visually impaired people will appreciate text posts in electronic media and social networks, while picture posts, even though they contain typed text in the picture, will make it difficult, if not impossible, for them to be informed about your programme.

If your class includes learners with visual impairments, make sure to describe all visual content in detail. Describe graphic representations, schemes, etc. Also, describe humorous memes and gifs and other illustrations that do not have a purely didactic role, but rather an animator role. Don’t let a good visual joke bypass the learners with visual impairments (it’s very strange to be the only one who doesn’t laugh).

Pay attention to the use of demonstrative pronouns. ‘Here’, ‘there’, ‘this’ and ‘that’ and the like will not mean much to a visually impaired person without further explanation. When you address anyone from your group of learners, use personal names, so there will never be confusion about whom you are addressing, and you will make it easier for people with visual impairments to match their voice and name and thus get to know their colleagues better.

If you use some form of teaching material, agree with the person with visual impairment on how that person can consume it.

Ensure that written content can be printed in a large format, written material is available in electronic form, you have a sighted assistant who can act as an escort or support in written expression. Working and didactic materials should be in accessible formats: visually impaired people use them in Braille or in plain text format (for adaptation, you can contact any organisation that supports visually impaired people). With a little effort, you can make them yourself. Make your program available online, if possible. If you have not done this in advance, be ready to share all the content that you will present, and that you have in electronic form, with a visually impaired person on the spot via a USB stick or by e-mail.

Visually impaired people are very tactile. Allow them to study the schemes, mock-ups or the very procedures that are the subject of learning using their sense of touch. Tactile perception without seeing can be a slightly longer process, so it would be good to ensure that the student with visual impairment has some extended time for tactile study that can take place in parallel while you demonstrate to the rest of the group.

Also, people with visual impairments may take longer to complete assignments or tests, please make sure to allow them any extra time they might need.

— Spatial accommodations

People with visual impairments do not need any special adaptations in the space, but there are some tricks that will make their stay in your spaces more comfortable.

When a visually impaired person comes to your premises for the first time, don't be shy to ask them about their condition and the rest of their vision. Based on that, offer them help in getting to know your space. Agree on the way of helping and getting to know the space with a specific person, since the ways and methods are individual for each person. Don't expect the person to create a mental map of the space after the first stay in it, so you will need to go through the process of getting to know the space over a few first meetings. Be prepared to make small interventions in your space to make the movement of learners with visual impairment easier. It would be ideal if you could provide guide lines or a tactile map of the space. But even if you can't, it is possible to use different tools such as 3D printing, plasticine and the like in order to present a space to a visually impaired person. The objects serve as guideposts for these people, and it is very important that they do not change their place, if they are on the well-established route of visually impaired learners. If they want to, let them always sit in the same place in the room, since this is an important point of reference when moving within your space. Ensure sufficient lighting of the space, especially in situations of movement or in activities where significant use of vision is required. Sometimes it may seem to you that visually impaired people are a bit clumsy when moving or handling objects, but that doesn't mean you have to help and facilitate them in every situation. Make yourself available but help only when you are asked directly. Guidelines that can be installed in outdoor or indoor spaces are also very helpful for people with visual impairments. You can also install other tactile markings that could make it easier for visually impaired people to navigate your space. You can also create signs in Braille to mark the doors of rooms or common containers in the kitchen. There are many other interventions that you can introduce for a visually impaired person, but you will have to ask your learner exactly what they are.

— Technical accommodations

The development of new technologies has facilitated the inclusion of visually impaired people in educational processes. People with visual impairments most often use screen readers either on computers or smartphones. Also, if they use braille, it will most often be through a braille display, and less often via a printed format. Visually impaired people use various types of magnifiers, electronic and mechanical. There is a lot of technology available for people with visual impairments, but the most important thing is to check what your learner knows how to use adequately.

Matrix

1. Information gathering

1.1. About the disability

Although visual impairment is divided into low vision and blindness, it is important to remember that these are very broad categories that encompass a whole range of different conditions. There are many parameters that determine the visual perception of a person with visual impairment, so the category of low vision or blindness alone does not provide enough practical information. In order to navigate the forest of parameters that describe the state of vision, it is best to take the individual concerned as the source of the most accurate information. At this stage it is good to have a clear list of requirements regarding visual perception during participation in your programme. To successfully ask and find out what difficulties a visually impaired person might have during participation you should always have the requirements of your programme in mind.

1.2. About the person

We collect this information through a conversation with a potential learner. The conversation itself, as an exchange of verbal messages, will flow smoothly with most visually impaired people. What it would be good to keep in mind are the difficulties that can appear on the nonverbal level. A visually impaired person may not respond to your nonverbal communication, but you may also be confused by a visually impaired person's nonverbal messages. It is important that communication be verbal, descriptive, detailed and open as much as possible. Nonverbal communication in this case is not essential, it is just invisible and it is okay to describe it with words. You can describe your reactions, but also describe what you noticed in the learner. Some persons with visual impairment, especially those blind from birth, have unusual nonverbal communication (facial expressions, hand and body movements), don't jump to conclusions about the meaning of these without checking.

1.3. About accommodation

The most common accommodations for people with visual impairments in the context of lifelong learning relate to accommodations related to reading and writing, as well as orientation and movement in space. Here, too, it is important that you primarily keep in mind the requirements of your programme, and that together with the potential learner, you check what their needs are in terms of difficulty and the desired programme.

2. Selection of the accommodation

2.1. Utility criterion

2.2. Economy criterion

Most assistive technologies for blind and partially sighted people are quite expensive. But it is important to know that you as an education provider do not have to own or provide all the necessary technology. It is permissible for an individual to use their own devices if they wish. In addition, it is important that you know that in most cities there are schools and institutions or other organisations that deal with visual impairment and that can provide you with the necessary technologies for a certain period of time.

2.3. Purpose criterion

2.4. Sustainability criterion

It is perfectly fine for a person with visual impairment and you and other learners to help them move or find their way around the tasks in the programme, especially during the adjustment period. But it is extremely important that you encourage the person to be as independent as possible in their learning, including the use of rooms, tools and equipment for work. Although cooperation and help from colleagues is always welcome, it should not be the sole function of accommodation.

3. Application of the selected accommodation

For people with visual impairment, accommodations in the educational context are most often related to assistive technologies. If your accommodation for the visually impaired relies on technology there is always the possibility that something, someday, will not work. Technology can be unpredictable, just like people. In such situations, it is not necessary to cancel participation, but resort to the next best forms of accommodations until the difficulty is resolved.

4. Checking the functionality of the accommodation

4.1. Utility criterion
4.2. Economy criterion
4.3. Purpose criterion
4.4. Sustainability criterion

5. Making a decision about the functionality of the adaptation

Motor disorders

Motor disorders refer to disorders of gross and fine motor skills and body balance that prevent daily functioning. In short, this refers to average bodily functioning.

Motor disorders include a very wide and varied group of motor difficulties, from mild motor clumsiness to very severe disorders of movement and body position due to which a person needs constant help and care.

We divide motor disorders into four categories, taking into account the cause of the disorder, i.e. which body system is damaged, resulting in one of the following motor disorders:

1. Damage to the locomotor system;
2. Damage to the central nervous system;
3. Damage to the peripheral nervous system;
4. Damage caused as a result of chronic somatic damage or chronic diseases of other systems

Motor skills have significant implications for everyday life. Motor impairment has its most significant consequences in a person's independent mobility. As the degree of impairment increases, independence decreases, which consequently increases feelings of frustration. With less mobility, a person has a limited social circle in which to move, which consequently has a harmful effect on mental health. If the disorder occurred at an early age, a better adaptation to life with motor difficulties is predicted. However, with the later development of impairment, a person perceives it as an extremely stressful or traumatic event that significantly impairs mental health and requires large adaptive resources. The greater the visibility of the damage, the greater the stigmatisation. However, it is important to say that the presence of motor difficulties does not necessarily result in emotional disorders. If a person's basic life needs are met from the earliest days, then this represents a good foundation for further socio-emotional development.

Accommodations in educational environment

— Organisational accommodations

For people who have difficulty moving, ensure that they can access the qualification procedure without too much physical effort (ground floor room, lift, ramp, etc.).

Materials in electronic form can be useful for people with motor impairments and all other learners who prefer to learn from a screen rather than from paper.

General examples of adapting the teaching content to adults with motor disorders and chronic diseases are releasing or replacing the executor of a certain task.

Give them more frequent breaks if they get tired or extend the time for them to solve a task.

Adjust the expectations of the level of success achieved with regard to the person’s capabilities and limitations and implement other adjustments in relation to the specific needs of people with motor disorders and/or chronic diseases.

— Spatial accommodations

If you have learners in your programme who have difficulty moving, make sure that the rooms where the learning will take place are easily accessible (lift, ground floor).

Technical (ergonomic) adaptation — widening the door, securing a ramp, relocating a light switch, door handle, window or shelf for someone who has difficulty reaching (lower level).

If your student who has difficulty moving can climb the stairs on their own, make sure to support them in doing so. Agree with the student how you can do this.

If you are by no means able to ensure that learning takes place in ground floor rooms or in a building with a lift, it does not mean that you have to stop cooperation with a learner who has difficulty moving. Talk to the learner, show goodwill and explain what resources you can make available. It’s highly likely that you’ll jointly devise a way to conquer the floors in front of you.

People who use wheelchairs use a specially adapted toilet, and it would be good if the place where learning takes place has such a toilet. If you are unable to provide such a space, communicate with your student and try to come up with a joint solution. This is certainly not a reason to terminate cooperation with the learner.

Some people with chronic diseases have a need to use the toilet often or urgently, allow them to choose a place in the room from which they will have unhindered access to the toilet.

Also, some chronic diseases require more frequent consumption of food or drink. In agreement with the learner, provide a place for storing food and drinks that will not interfere with the use of work and didactic materials and the performance of practical exercises.

In addition to the amount of light, the amount of air is also important, and in agreement with the learners, take care to regularly ventilate the space.

People with motor disabilities and chronic illnesses probably won’t need any special adjustments to your explanation but be sure to check with them. Be open to feedback from your trainees.

The implementation of demonstration and guidance methods may require certain accommodations that you agree on in collaboration with the learners themselves.

— Technical accommodations

The difficulties a person might have due to a motor disorder can generally be reduced to two groups. These are fine motor difficulties (fine motor refers to precise, fine movements such as writing, cutting, keyboarding, sewing, modelling, etc.) and gross motor difficulties (gross motor refers to standing, walking, bending, climbing, transferring, lifting, etc.). Therefore, assistive technology can help overcome these difficulties during the educational process.

Assistive technology is divided into low AT (‘low-tech’) — passive or simple, composed of only a few parts (book holders, writing aids, turning pages, etc.) and high AT (‘high-tech’), which are a lot more complex, they may also have an electrical component (computers, powered wheelchairs, alternative keyboards and mice, environmental control units, robots and electronic spell checkers, electrical writing and feeding aids, etc.).

Examples of AT used by people with MP/KB are Communicator 5, Grud 3, Servus device, Integra mouse plus, Quha zone, Tracball optima and many others.

Matrix

1. Information gathering

1.1. About the disability

The group of motor impairments is extremely heterogeneous and includes many more difficulties than mobility itself. Motor difficulties are often not a disorder in themselves but part of the clinical picture of some other diseases and conditions. When we research difficulties, it is important to take this into account and to investigate the possible implications of the primary diagnosis on the outcome of the educational process.

1.2. About the person

People with motor disabilities also may have speech and voice difficulties. This means that speech can be difficult, unintelligible, and sometimes completely unenabled. Considering that selfcare for some people with motor impairments can be challenging, or you, as an education provider, have dilemmas in that matter, there is a very high probability that you will have to talk about extremely intimate things like using the toilet, feeding, drinking and basic hygiene.

1.3. About the accommodation

This group of people will especially need spatial accommodations. Also, they often rely on the services of specialised transport to move around the city, therefore it is possible that their presence in a certain place at a certain time is conditioned by the availability of such specialised transport. People with severe motor impairments sometimes use the service of a personal assistant. It is important to see the assistant as one of the forms of accommodation, and not as a representative and/or spokesperson for learners with a motor disability.

2. Selection of the accommodation

Education providers have the primary obligation of ensuring that persons with motor disabilities can participate in the education programme through the removal of spatial barriers.

2.1. Utility criterion
2.2. Economy criterion
2.3. Purpose criterion
2.4. Sustainability criterion

3. Application of the selected accommodation

4. Checking the functionality of the accommodation

Due to physical limitations, some people with motor difficulties will perform certain actions in a different way and be very slow. This does not mean that the chosen accommodation is not reasonable and does not fulfil its purpose. It is good to agree in advance with the learner an extended time for carrying out the relevant activity.

4.1. Utility criterion
4.2. Economy criterion
4.3. Purpose criterion
4.4. Sustainability criterion

5. Making a decision about the functionality of the adaptation

Mental disorders and behavioural disorders

This category of disorders includes a very large number of difficulties/conditions and diseases in the domain of mental health. Health in terms of mental functioning is difficult to operationalise. Key in the definition of health is the state of general well-being and the ability to cope with the usual challenges of life and the demands of the environment. On the other hand, mental disorders represent a lack of health in terms of mental functioning. In order for a lack of health to be called a disorder, a change in a person's behaviour and perception of the world around them must be long-lasting, intense and repeated over and over again in everyday situations. Also, it almost as a rule includes significant suffering or disability of the person itself and often features a series of failed attempts by the individual to help themself in the direction of re-establishing well-being. The diagnosis is made exclusively by a psychiatrist, often in collaboration with experts from other fields. The most severe consequences of mental disorders and behavioural disorders are found in the distorted way in which a person sees the world around them and their inadequate attempts to establish relationships with people around them. The greater the distortion in the perception of the environment, the greater the communication difficulties with it. It is important to be familiar with the guidelines that can help us to more successfully recognise the possibility of impaired mental health in another person and the basics of first aid that we can provide to a person in psychological crisis. We can all follow the existing guidelines; however, it is important not to assume

responsibility for any actions of a person in crisis and to try to establish a connection with the primary mental healthcare system in the country as soon as possible. It is a common misconception that people with mental impairments are aggressive and very unpredictable, but it should be emphasised that mental disorders and behavioural disorders in general do not have aggressive and self-destructive tendencies at their core, and that these are only specific disorders and specific patients. Considering the multitude of types and degrees of mental health illnesses, it is demanding to describe this group of diseases in general, and it is definitely advisable to openly discuss the difficulties seen in a person, of course on a voluntary level, and offer cooperation within the framework of the implementation of a certain informal programme.

Accommodations in educational environment

— Organisational accommodations

People with mental health issues will most likely need this type of accommodation.
Some good strategies are:

— Flexible schedule
This does not mean that you will change the schedule or time of your programme according to the state of learners with mental disabilities; it just means that you should be understanding of possible frequent absences and offer the possibility of remote participation.

— Modified break schedule
Of course, it is important that the breaks are agreed upon at the level of all learners, but it would still be a good idea to create a group climate where all learners can take a break when they feel the real need for it.

— Rest area/private space
Social moments can be exhausting for people with mental health problems, it is a great idea to arrange a safe place where the individual can calm down and gather strength for the future.

— Support animal
Animals have a beneficial effect on most people. Their presence at your training will enrich the experience of all learners. For people with mental disabilities, animals can be a support without which they cannot function.

— Support person
Assistants provide support and some people need them. Agree with your learner how they want the assistant to be involved in the educational programme.

— Identify and reduce triggers
Talk a lot with your learner with mental health issues, and let them know that it’s okay for them to take care of themselves in situations where they feel threatened or uncomfortable. Also talk about their triggers so that you can take part in their removal and recognition together.

— **Spatial accommodations**

It is important that your space is calm, bright and airy. Remove all distractions. Also, when presenting, do not use visually and auditory aggressive stimuli. The interior is important, don’t change the rooms or the arrangement in them often. Sometimes a person with a mental disability needs a dose of privacy and distance from social interactions, consider how you can provide a private space.

— **Technical accommodations**

Today, technology enables us to approach learning in various ways. Use all the opportunities it provides to include people with mental health problems. Enable distance learning, use special fonts for people with dyslexia and dysgraphia. Enable recording of your activities.

Matrix

1. Information gathering

1.1. About the disability

Considering that this is an extremely heterogeneous group of disorders, the general recommendation is to learn about the universal principles of open and clear communication, and about ways of communicating about mental health problems, rather than searching for information about a specific diagnosis. Undirected research on the diagnosis can lead to disastrous conclusions and reinforce our eventual myths and prejudices against this group of people. If we want to get information about a specific problem, if possible, it is best to talk about it with the individual concerned. Mental health problems are very often invisible difficulties. This means that they can exist, but that the difficulties do not have to manifest in the educational environment.

1.2. About the person

1.3. About the accommodation

There are no universal accommodation for mental difficulties, so it is most important to reach an agreement with the person to independently monitor and evaluate their own possibilities of participating in the programme. The universal rules that allow all learners to participate in group-dynamic activities on a voluntary basis and to the extent that it is comfortable for the individual come to the fore here. In order to ensure that you have adequate support and guidance for navigating the situation of teaching a person with mental health problems, it is useful to network with organisations or institutions that deal with mental health.

2. Selection of the accommodation

2.1. Utility criterion
2.2. Economy criterion
2.3. Purpose criterion
2.4. Sustainability criterion

3. Application of the selected accommodation

Whichever accommodation we choose, it is more important that we are open-minded and aware of our own ideas and preconceptions about mental health problems. Consequently, it is useful to be flexible and willing to work outside the box to include a person with a mental disability on an equal basis.

4. Checking the functionality of the accommodation

4.1. Utility criterion
4.2. Economy criterion
4.3. Purpose criterion
4.4. Sustainability criterion

Apart from these criteria, the most important test of the functionality of our accommodation is the individual themself. We observe and notice the person's involvement, but it is still necessary to directly, openly and continuously seek feedback from learners with mental health problems. Considering that this is a person with a mental disability, what we perceive and what the person really experiences do not have to match, so it is extremely important to regularly exchange impressions.

5. Making a decision about the functionality of the adaptation

Intellectual disability

Intellectual difficulties are defined as a condition that arises during the early period of a child's development, and which is characterised by significantly below-average intellectual functioning and adaptive behaviour. Three important points stand out in this description of intellectual disabilities: onset during early growth and development, intellectual functioning and adaptive functioning.

The beginning of the condition first manifests during the child's early development, i.e. during childhood and adolescence. The American classification manual strictly determines that the first difficulties must develop by the age of 18. Intellectual functioning is the ability to think that enables individuals to navigate new situations. Intelligence is primarily a genetically determined potential, tends towards stability, is resistant to training, and is not something that can be learned. It is measured by intelligence tests. The unit for marking the level of intelligence expressed on tests is called the intelligence quotient (IQ). The average value of IQ is 100, and if it is lower than 70, then a difficulty is suspected.

Adaptive functioning refers to how effectively a person meets the demands of everyday life and how well they meet the standards of personal independence for a particular age group, socio-cultural background and community conditions. Adaptive functioning is primarily a learned behaviour and can be learned and improved. It includes communication skills, social skills, school/work skills and personal independence skills.

The name for this type of difficulty has changed a number of times. The term in use longest (in recent history) is 'mental retardation'. The name mental retardation is still current, however, new disease classifications have replaced it with the term 'intellectual disabilities'. The correct name for a person who has an intellectual disability is 'person with intellectual disability'.

Accommodations in educational environment

Accommodating people who manifest the difficulties described above can be quite challenging, primarily because the main tool for adaptation is ourselves. Most of the adjustments relate to the method of communication.

In communication with people with intellectual disabilities, there is a common feeling of frustration due to the frequent need to repeat content that has already been said several times before. It is extremely important to be patient in contact, to repeat as many times as necessary and show acceptance of the person in full, along with their difficulties.

In order to make the process of imparting knowledge more pleasant for both the lecturer and the learner who manifests difficulties, including intellectual difficulties, we can rely on three main groups of teaching methods (explanation, demonstration, guidance).

— Method of explanation

Be prepared to adapt the content you teach. Sometimes it will be necessary to reduce the scope, sometimes the terminology and complexity of expression, sometimes the dynamics of the lecture.

Which of these techniques you need will most often you will have to discover on your own, since people with intellectual disabilities very often do not see themselves as intellectually disabled nor can they clearly verbalise what form of adaptations they need. What you can definitely do is to prepare a simple written presentation of the content to share with the student with intellectual disabilities. Set aside time during the lecture when you will discuss the most important concepts and settings with the student with intellectual disabilities. If it is acceptable to you, you can do this about 15 minutes after the lecture. Use simple language but be sure to maintain a position in which you respect the learner as an adult, equal to yourself, and do not place yourself in a higher position. Also, it is important that the educational process takes place in a space with as few disruptive factors as possible.

When explaining, it is advisable to use common words and simple, short sentences. It is best to avoid abstract terms and professional terminology. In communication, try to focus on the specific, ask clear questions and use longer pauses in expression.

When giving work instructions, more complex tasks need to be broken down into smaller operations. For each operation, it is necessary to give a separate instruction, and make sure to check the learner has understood each instruction. Then, enable realistic application of the instructions, which should be followed closely and continuous feedback given on what has been done.

When checking understanding, it is important to ask the person to repeat the given instruction as they understood it. We are then able to supplement the omitted parts and correct inaccuracies. Afterwards, it is a good idea to re-check understanding by verbally reproducing the procedures (‘Please repeat the instruction to me to see if you understood me correctly.’). Avoid the question: ‘Did you understand me?’ as it will usually only be followed by a ‘yes’ or ‘no’ answer that will tell you little about the learner’s actual understanding of the task. Finally, it is a good idea to check again if there are any questions, encourage the learner to write the instruction down on paper, and monitor the learner’s performance of the assigned task again.

— Demonstration method

Do the demonstration only for that person, following it with a simple and precise explanation. Be sure to be prepared to demonstrate multiple times and at a slower pace than usual. Demonstration is a method that you will use many times. Since their ability to remember is impaired, do not expect them to adopt the process even though you have repeated it many times. You may need to demonstrate whenever you ask a person to perform a task.

— Guidance method

You can enable the trainee to try by themselves, but with supervision and guidance. It is possible that several attempts will be needed in order for the learner to successfully master a procedure. Also, it is possible that they will not master it successfully, but it is important that you still allow learners to practice and attempt the task. Don’t allow guidance to form part of the game if that wasn’t your original goal.

This method enables learners to reproduce newly acquired knowledge in a safe environment. It is important that you are focused on creating a stimulating atmosphere and that you supervise the entire process. It is always good to check understanding, the need for additional clarifications and that you monitor how the instructions are carried out. It is important to monitor the person’s overall behaviour in order to identify anything that may indicate confusion, ambiguity or the need for additional support. During the entire process, it is necessary to pay attention to motivation and encourage and maintain this using different creative methods. There can often be a drop in motivation due to failure, so it is important to remember that sometimes success is accomplished just by participating in the process and making an effort, just as much as successfully mastering the task.

Matrix

1. Information gathering

1.1. About the disability

First of all, it is necessary to determine what level of intellectual difficulties our potential learner has. People with intellectual disabilities are specific in a way that they most often do not see and recognise their disability, they are not ready to answer the question of what type of disability it is and to what degree it impairs them. This type of information should be obtained from other relevant persons who usually accompany the individual, such as assistants, or other sources such as professional literature or associations/experts involved with intellectual disabilities.

1.2. About the person

Here it is good to examine the reasons for joining the programme. If our potential learner exhibits strong intrinsic motivation, then there is a higher probability that participation will be more successful. People with intellectual disabilities often get involved in activities because someone else has instructed them that it would be good for them. It is worth checking if there is anything in that programme that really motivates them, because this will mean greater investment of effort and better cooperation and, in the end, greater success in achieving learning outcomes. It is also important to find out whether there are any other specifics regarding behaviour or unusual ways of meeting needs/ritualised patterns that could be expected during the classes (frequent trips to the toilet, meals at a specific time, a specific sitting position in the study room, etc.). Furthermore, it is important to find out if there are any other health conditions that could interfere with the educational process. Namely, people with intellectual disabilities often have comorbid conditions.

1.3. About the accommodation

What we should focus our attention on is the way we communicate with them. Namely, simplicity of language is the main guiding thread in the expression of the person conducting the educational process. It is advisable to use common words and short sentences. For people with intellectual disabilities, it will often be necessary to adapt the content. Sometimes it will be necessary to simplify it, sometimes to shorten it, sometimes to reshape it, but that depends on each person.

2. Selection of the accommodation

2.1. Utility criterion
2.2. Economy criterion
2.3. Purpose criterion
2.4. Sustainability criterion

3. Application of the selected accommodation

4. Checking the functionality of the accommodation

4.1. Utility criterion
4.2. Economy criterion
4.3. Purpose criterion
4.4. Sustainability criterion

5. Making a decision about the functionality of the adaptation

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Chapter 3:

Assistive Technologies (AT) as a Tool for Increasing the Participation of PWDs in Non-Formal Adult Education

Introduction

Assistive technologies are tools designed to improve the functional capabilities of persons with disabilities, enabling them to perform activities that would otherwise be difficult or impossible. These technologies can be essential in increasing the participation of persons with disabilities in non-formal adult education, as they can help overcome barriers to learning and enhance the learning experience.

Assistive technologies for education can take many forms, including text-to-speech software, screen readers, voice recognition software, adaptive keyboards, and specialised computer hardware. These tools can help persons with visual, hearing, physical, or cognitive impairments to access educational materials, communicate with instructors and fellow learners, and complete tasks and assignments.

In addition to specific assistive technologies, educational institutions, and organisations can take steps to ensure that their non-formal adult education programmes are inclusive and accessible to persons with disabilities. This might include offering flexible schedules or alternative learning formats, providing captioning or sign language interpretation, or incorporating universal design principles into course materials and activities.

Overall, assistive technologies have the potential to significantly increase the participation of persons with disabilities in non-formal adult education, opening up new opportunities for learning, skill-building, and personal growth. By prioritising accessibility and inclusivity in educational programming, we can help ensure all learners have the tools they need to succeed.

> MSFTEnable: Assistive Technology (YouTube video)

Assistive technologies for different types of disabilities

Assistive technology can be a game-changer for persons with disabilities in inclusive non-formal education. Assistive technology refers to devices or software that can help persons with disabilities overcome barriers to learning.

Here are some examples of assistive technology that can be used in inclusive non-formal education:

— **Screen readers:** Screen readers are software programs that read text aloud, allowing persons with visual impairments to access written content.

— **Text-to-speech software:** Text-to-speech software can help persons with cognitive disabilities or learning differences to understand written content by reading it aloud.

— **Alternative keyboards and pointing devices:** alternative keyboards and pointing devices can help persons with physical disabilities to use computers and other technology.

— **Augmentative and alternative communication devices:** Augmentative and alternative communication devices can help persons with communication disabilities to express themselves.

— **Hearing aids and cochlear implants:** Hearing aids and cochlear implants can help persons with hearing impairments to hear and understand spoken content.

By using assistive technology in inclusive non-formal education, we can ensure that everyone has equal access to learning opportunities. Let's continue to explore and use assistive technology to make education more accessible and inclusive for all.

Low Vision Solutions
source: https://www.flickr.com/photos/radlicek/49026120242/

AT for learners with visual impairment

Partially sighted person / screen user

A person whose visual impairment enables the use of sight (and also text) with common document formats, including the visual ones. The modification is based on zooming and other changes of optical character, it is not necessary to use a screen reader.

Legally blind person / Braille or speech output user

A person who works either with tactile print documents or screen readers (in combination with tactile display and voice output), which require an editable text document format or a document adapted in content and form. This category also includes persons who are commonly described as severely visually impaired, blind or practically blind.

For learners with visual impairment, there are various assistive technologies that can help them to access educational materials, communicate with instructors and peers and complete assignments. For those who are partially sighted or rely on screen reading software, some of the most common assistive technologies include:

— **Screen readers:** Screen readers are software programs that convert on-screen text into synthesised speech, enabling users to hear what is displayed on the screen. Screen readers can read text from web pages, documents and other digital resources, and can often be customised to the user's preferences.

> TetraLogical: Browsing with a desktop screen reader (YouTube video)

— **Magnification software:** Magnification software enlarges the text and graphics on the computer screen, making it easier for partially sighted users to read and navigate through digital materials. Many magnification programs also offer colour contrast and other customisation options.

> TetraLogical: Browsing with screen magnification (YouTube video)
> Freedom Scientific: ZoomText Videos (YouTube video)

— **Braille displays:** Braille displays are hardware devices that convert digital text into Braille, enabling users to read and navigate digital materials using Braille output. Braille displays can be used in conjunction with screen readers or other assistive technologies to provide a comprehensive access solution for learners with visual impairments.

> Freedom Scientific: Focus Blue Refreshable Braille (YouTube video)

— **Electronic Braille writers:** These devices allow individuals who are blind to write and edit documents in Braille, which can then be displayed on a Braille display or printed out in Braille format.

— **Optical character recognition (OCR):** OCR software can convert printed text into digital text, enabling learners with visual impairments to access printed materials such as textbooks, handouts and other documents. This technology can be especially useful for learners who may not have access to digital versions of printed materials.

> Naviant: What is OCR — Optical Character Recognition Explained in 60 Seconds (YouTube video)

— **Voice recognition software:** Voice recognition software enables users to control their computers and dictate text using spoken commands. This technology can be useful for learners with visual impairments who may have difficulty using traditional input devices such as a mouse or keyboard.

> TetraLogical: Browsing with speech recognition (YouTube video)

Learners with visual impairments can also benefit from

— **Audio books:** These are recordings of books and other materials that can be listened to, allowing individuals with visual impairments to learn through listening.
— **Handheld magnifiers:** These devices magnify text and images on printed materials, such as books and papers, making them easier to read.
— **Large print materials:** These materials have larger font sizes and increased spacing between lines, making them easier to read for partially sighted individuals.
— **Tactile graphics:** These are graphics that use raised lines, textures and other tactile elements to represent visual information, such as maps, charts and diagrams.

In addition to these technologies, it is important for non-formal adult education providers to ensure that their materials are designed with accessibility in mind. This may include using high-contrast colours, ensuring that text is legible, and avoiding the use of complex layouts that can be difficult for partially sighted individuals to navigate.

Overall, there is a range of assistive technologies available to support learners with visual impairments, and it is important to work with the learner and their support team to identify the tools that will be most effective for their specific needs.

AT for learners with hearing loss

Hard-of-hearing person / spoken language user

A person who spontaneously receives and produces spoken language (in speech and writing). This category also includes persons who are, from a clinical point of view, described as deaf (or deafened), but who are primarily spoken not sign language users.

Deaf / sign language user

A person who spontaneously receives and produces sign language, or another form of nonverbal communication.

For learners with hearing impairment, there are various assistive technologies that can help them to access educational materials, communicate with instructors and peers, and complete assignments. For those who are hard of hearing or sign language users, some of the most common assistive technologies include:

— **Hearing aids:** These are devices that amplify sound and improve the clarity of speech, making it easier for individuals with hearing loss to understand spoken language.

— **Cochlear implants:** These are small electronic devices that are surgically implanted in the inner ear and provide a sense of sound to individuals with severe to profound hearing loss.

> Yale Medicine: How Do Cochlear Implants Work? (YouTube video)

— **FM systems:** These are wireless systems that amplify the sound of the teacher's voice, making it easier for learners with hearing loss to hear and understand what is being said.

— **Closed captioning:** This technology displays text on a screen to provide a written transcript of spoken words. It can be particularly helpful for individuals who are deaf or hard of hearing.

> 3Play Media: What Are Closed Captions? (YouTube video)
> Madison College DRS: Benefits of Closed Captioning (YouTube video)

— **Sign language interpreters:** For individuals who use sign language as their primary mode of communication, having a sign language interpreter can be critical for understanding and participating in non-formal adult education programmes.

— **Visual aids:** These can include diagrams, illustrations and other visual aids that help learners with hearing loss understand concepts and information that may be presented in spoken form.

— **Vibrating alarms:** These can be helpful for individuals with hearing loss who may not be able to hear auditory alarms or alerts. A vibrating alarm can be set to go off at a specific time or when a particular event occurs.

It is also important for non-formal adult education providers to ensure that their programmes and materials are designed with accessibility in mind, including the use of captions, visual aids and other accommodations that can help individuals with hearing loss participate fully. In addition to assistive technologies, other strategies may include using clear speech, facing the learner when speaking and minimising background noise.

AT for learners with mobility impairment

Impairment of lower limbs (paraplegia)

A person who — with regard to their mobility impairment — requires and uses various personal equipment for independent movement, such as walking sticks, or mechanical or electric wheelchairs. This category also includes persons whose medical diagnoses state only the cause (e.g. CP) and not the effects on the function of the locomotor system.

Impairment of upper limbs (fine motor skills)

Fine motor skills are impaired to such an extent that a person is not able to operatively and effectively carry out activities that are common during study — taking notes by hand or on a keyboard, manipulating objects and equipment that are indispensable for the fulfilment of study obligations (physical books, stationery, instruments, etc.), or manipulating objects of daily use.

— **Wheelchairs:** These devices enable individuals with mobility impairments to move around independently, allowing them to participate in non-formal adult education programmes more easily.

— **Mobility scooters:** Similar to wheelchairs, mobility scooters can provide increased mobility and independence for individuals with mobility impairments.

— **Stairlifts:** These devices can be installed in buildings with stairs, allowing individuals with mobility impairments to access different levels and participate in activities held in these areas.

— **Ramps:** Ramps can be installed to provide access to buildings or areas that may be difficult to reach for individuals with mobility impairments.

— **Lifts:** Lifts can be installed in buildings to allow individuals with mobility impairments to access upper levels or other areas that may be difficult to reach.

— **Voice recognition software:** This technology allows users to control their computer or other devices using their voice, making it easier for individuals with mobility impairments to access and interact with technology.

— **Adaptive keyboards and mice:** These devices can be designed to accommodate individuals with mobility impairments, such as those who may have difficulty using standard keyboards or mice.

> Engadget: Microsoft Adaptive Mouse kit hands-on: Inclusive & customizable (YouTube video)

— **Environmental control systems:** These systems allow individuals with mobility impairments to control various aspects of their environment, such as lighting, temperature and appliances, using a single device.

In addition to these technologies, it is important for non-formal adult education providers to ensure that their programmes and materials are designed with accessibility in mind, including the use of clear signage, wider aisles and other accommodations that can help individuals with mobility impairments participate fully.

AT for learners with a specific learning disorder (SLD)

A person who objectively cannot fulfil study obligations in the standard manner due to dyslexia, dysorthography, dyscalculia, dyspraxia, often in parallel with ADHD (attention deficit hyperactivity disorder). The disability can appear in the inadequate development of specific academic, language and speech skills (reading, writing, mathematics).

Here are some examples of assistive technologies that may be useful for learners with SLDs in non-formal adult education:

— **Text-to-speech software:** This technology can help learners with reading difficulties by converting text to speech, allowing them to listen to the material instead of reading it.

> Rued Riis: Text to Speech Software: 5 Tools You MUST Know (YouTube video)
> Kevin Stratvert: Best FREE Speech to Text AI — Whisper AI (YouTube video)

— **Speech recognition software:** This technology can help learners with writing difficulties by allowing them to dictate their thoughts and have them transcribed into text.

— **Mind mapping software:** This technology can help learners with organisation and brainstorming difficulties by allowing them to create visual diagrams that help them to see connections between ideas.

— **Audio books and podcasts:** These resources can help learners with reading difficulties by providing alternative ways of accessing material.

— **Word prediction software:** This technology can help learners with spelling difficulties by predicting the word they are trying to type based on the letters they have already typed.
— **Graphic organisers:** These visual aids can help learners with organisation and memory difficulties by providing a structure for information.
— **Adaptive keyboards and mice:** These technologies can help learners with physical difficulties by providing alternative ways of accessing the computer.

It's important to note that, while assistive technologies can be very helpful, they are not a one-size-fits-all solution. Each learner with an SLD may have unique needs and may require different types of assistive technologies. Additionally, learners may need some training and support to use the technology effectively.

Finally, it's important to remember that assistive technologies are just one tool in a larger toolkit for supporting learners with SLDs. Other interventions, such as accommodations and modifications to teaching methods, may also be necessary to ensure that learners with SLDs have equal access to education.

AT for learners with autism spectrum disorder (ASD)

A person who objectively cannot fulfil study obligations in the standard manner due to a neurodevelopmental autism spectrum disorder, including Asperger's syndrome, and who requires psychological, pedagogical and organisational measures on the part of the educational institution.

Assistive technologies can be very helpful for individuals with autism spectrum disorder (ASD) in non-formal adult education settings. These technologies can help to improve communication, social skills and learning outcomes for individuals with ASD.

Here are some examples of assistive technologies that may be useful for individuals with ASD in non-formal adult education:

— **Communication apps:** These apps can help individuals with ASD to communicate more effectively by providing visual aids, icons and other supports.

— **Social skills apps:** These apps can help individuals with ASD to develop social skills by providing scenarios, feedback and other supports to help them understand social cues and expectations.

— **Text-to-speech and speech-to-text software:** These technologies can help individuals with ASD who have difficulties with reading, writing and expressive language.

— **Video modelling and social stories:** These visual aids can help individuals with ASD to understand and learn social skills and other behaviours.

— **Virtual reality and augmented reality:** These technologies can provide immersive experiences that can help individuals with ASD to develop skills in a safe and controlled environment.
— **Sensory integration tools:** These tools can help individuals with ASD to manage sensory processing difficulties, such as noise sensitivity or sensory overload.
— **Time management apps:** These apps can help individuals with ASD to manage their time and schedules more effectively.

It's important to note that, while assistive technologies can be very helpful, they are not a one-size-fits-all solution. Each individual with ASD may have unique needs and may require different types of assistive technologies. Additionally, individuals may need some training and support to use the technology effectively.

Finally, it's important to remember that assistive technologies are just one tool in a larger toolkit for supporting individuals with ASD. Other interventions, such as accommodations and modifications to teaching methods, may also be necessary to ensure that individuals with ASD have equal access to education.

AT for learners with other difficulties

A person who objectively cannot fulfil study obligations in the standard manner due to another mental disorder or disease, including neurodevelopmental disorders, i.e. disturbed language, speech and other communication skills, or chronic disease, and who requires organisational measures on the part of the educational institution.

Here are some examples of assistive technologies that can aid these learners in their learning:

— **Communication aids:** These can be devices or software applications that help individuals with communication difficulties, such as those with disturbed language, speech and other communication skills. These aids can include text-to-speech software, voice recognition software and alternative communication devices like communication boards and AAC (augmentative and alternative communication) devices.

— **Cognitive assistive technology:** These are software applications designed to help individuals with cognitive difficulties, such as those with neurodevelopmental disorders like ADHD or autism. These can include apps that help with time management, organisation and memory aids.

— **Medical alert systems:** These systems can be used by individuals with chronic diseases, such as diabetes or heart disease, to alert them to potential health issues or emergencies.

- **Virtual reality:** This technology can be used to create immersive environments that can help individuals with mental disorders, such as anxiety or PTSD, to confront and overcome their fears in a controlled environment.
- **Biofeedback devices:** These devices can be used to help individuals with chronic pain or other chronic illnesses to manage their symptoms, by providing feedback on things like heart rate, breathing and muscle tension.
- **Text-to-speech software:** This technology can be used to convert text into spoken language, making it easier for individuals with reading difficulties or learning disabilities to access written materials.
- **Assistive listening devices:** These devices can be used to amplify sound, making it easier for individuals with hearing difficulties to hear and understand audio content.

It is important for non-formal adult education providers to ensure that their programmes and materials are designed with accessibility in mind, including the use of plain language, clear instructions and other accommodations that can help individuals with other difficulties participate fully. By taking these steps, non-formal adult education providers can help ensure that all learners, including those with mental disorders or diseases, can fully participate in their programmes.

Assistive Technologies & Accessible Environment

Assistive technologies are indeed important. But, without an accessible environment, they will never work as expected.

The accessible digital environment is a collection of technologies, tools and processes that enable persons with disabilities to access, interact with and use digital content. This includes everything from screen readers and assistive technology to web accessibility standards and designing websites compatible with various assistive technologies. It also includes providing content in an easily understandable format and alternative ways to access it. Other features of an accessible digital environment include providing accessible navigation and alternative ways of interacting with the content.

Accessible digital environments are important because they ensure everyone can access digital spaces and the information they contain, regardless of their abilities. Making digital spaces accessible helps to foster an inclusive and diverse online community and allows people of all abilities to participate equally in online activities. Accessibility also helps ensure that digital resources are available to the broadest possible audience, allowing those with disabilities to access the same content as everyone else.

An accessible digital environment can be beneficial in a number of ways, including:

— **Improving accessibility:** An accessible digital environment can help individuals with disabilities to access information, products and services online, which can be especially important for individuals who have difficulty with physical access to traditional educational settings.

— **Enhancing inclusion:** An accessible digital environment can help to create a more inclusive learning environment, ensuring that all learners can participate fully and equally in non-formal adult education programmes.

— **Facilitating learning:** An accessible digital environment can help to facilitate learning, by providing individuals with a range of tools and resources that can support their learning needs.

— **Meeting legal requirements:** In many countries, there are legal requirements for websites and digital platforms to be accessible to individuals with disabilities. By creating an accessible digital environment, non-formal adult education providers can ensure that they are complying with these legal requirements.

To ensure that a digital environment is accessible, there are a number of rules and guidelines that should be followed, such as:

— **Web Content Accessibility Guidelines (WCAG):** These guidelines provide a set of technical standards for creating accessible web content, including guidelines for text alternatives, colour contrast, keyboard accessibility and other accessibility features.

— **User-centered design:** The design of a digital environment should be centred around the needs of users with disabilities, with a focus on providing an intuitive and easy-to-use interface that is accessible to everyone.

— **Assistive technology compatibility:** The digital environment should be designed to be compatible with a range of assistive technologies, such as screen readers, text-to-speech software and other accessibility tools.

— **Testing and evaluation:** The digital environment should be tested and evaluated regularly to ensure that it is meeting accessibility standards and to identify areas for improvement.

Overall, creating an accessible digital environment can be highly beneficial for non-formal adult education providers, as it can help to create a more inclusive and accessible learning environment for all learners.

Needs assessment, procurement and implementation of AT in an educational organisation

Assistive technology can play an important role in supporting learners with disabilities in educational organisations. To effectively implement assistive technology, a thorough needs assessment, procurement process and implementation plan are necessary. Here are some steps to consider:

— **Needs assessment:** Conduct a comprehensive assessment of the needs of learners with disabilities in the educational organisation. This assessment should include input from teachers, parents and learners themselves. The assessment should identify the types of assistive technology that will be most effective for each learner's specific needs.

— **Procurement:** Once the needs assessment is complete, identify the specific assistive technologies that will be necessary to meet those needs. Research the available options and consider factors such as compatibility with existing hardware and software, ease of use and cost. Ensure that any technologies being considered are compliant with accessibility standards.

— **Budget:** Determine the budget available for purchasing assistive technology. Consider potential sources of funding, such as grants or partnerships with local organisations. Prioritise the technology needs based on the assessment conducted.

— **Implementation plan:** Develop a comprehensive plan for implementing the assistive technology, including training for teachers and staff, and ongoing support for learners. Ensure that staff and learners have the necessary support and resources to effectively use the technology. Consider accessibility and equity in the implementation of technology.

— **Evaluation:** Monitor the effectiveness of the assistive technology and make adjustments as necessary. Collect feedback from learners, teachers and staff to assess the impact of the technology on learning outcomes and learner engagement.

By following these steps, educational organisations can effectively assess, procure and implement assistive technology to support learners with disabilities, ensuring that they have the tools necessary to succeed in their educational pursuits. It is important to remember that the needs of each learner with disabilities may be different, and that an individualised approach is necessary to ensure the most effective use of assistive technology.

Identifying/evaluating needs

When evaluating the needs of learners with disabilities regarding assistive technologies, it is important to take a learner-centred approach. Here are some steps that can help in evaluating the needs of learners with disabilities regarding assistive technologies:

— **Gather information:** Start by gathering information about the learner's disability and how it impacts their learning needs. This may involve consulting with the learner, their parents and any professionals or specialists who have worked with them previously, such as speech therapists or occupational therapists.

— **Identify barriers:** Identify any barriers that may be preventing the learner from participating fully in non-formal adult education programmes, such as inaccessible materials, difficulty with communication or information processing, or physical barriers.

— **Explore assistive technologies:** Research and explore a range of assistive technologies that may be appropriate for the learner's needs. This may involve consulting with specialists in the field, reviewing relevant literature and resources, and attending training sessions or workshops.

— **Consider individual needs:** Consider the individual needs and preferences of the learner, including their learning style, sensory preferences and comfort level with technology. It may be helpful to involve the learner in the evaluation process and seek their input on which assistive technologies may be most helpful for them.

- **Assess feasibility:** Assess the feasibility of implementing assistive technologies, considering factors such as cost, availability, compatibility with existing systems and the level of training and support required.
- **Monitor progress:** Once assistive technologies have been implemented, it is important to monitor the learner's progress and make adjustments as needed. This may involve ongoing evaluation and assessment, as well as regular communication with the learner and their support network.

Obtaining/acquiring the device

Obtaining or acquiring assistive technology for learners with disabilities can be a complex process that involves careful planning, assessment and collaboration with various stakeholders. Here are some steps that can help in obtaining or acquiring assistive technology for learners with disabilities:

— **Identify needs:** Start by identifying the specific needs of the learner with disabilities, including the type of assistive technology that may be required. This may involve consulting with the learner, their parents and any professionals or specialists who have worked with them previously.

— **Conduct assessment:** Conduct a formal assessment of the learner's needs and abilities, using a variety of assessment tools and techniques. This may involve working with specialists such as speech therapists, occupational therapists, or assistive technology experts.

— **Research available technologies:** Research the available assistive technologies that may be appropriate for the learner's needs. This may involve reviewing literature and resources, consulting with experts in the field and attending training sessions or workshops.

— **Consider funding sources:** Determine the funding sources that may be available to support the acquisition of assistive technology. This may include government programmes, private foundations or other sources of funding.

— **Obtain equipment:** Once funding has been secured, obtain the necessary equipment and software. This may involve working with vendors, suppliers or manufacturers to ensure that the equipment meets the specific needs of the learner and is compatible with existing systems.

— **Provide training and support:** Provide training and ongoing support to the learner, as well as any staff members or support personnel who will be involved in the use of assistive technology. This may involve providing training on how to use the equipment and software, troubleshooting common issues and providing ongoing technical support.

Providing necessary modification and customisation

Here are some specific strategies that can be used to provide the necessary modification and customisation of assistive technology for learners with disabilities:

— **Selecting:** The first step is to identify the specific needs of the learner and select the appropriate assistive technology tools to address those needs. This may involve evaluating various options and considering factors such as the learner's functional abilities, learning style and physical, sensory, or cognitive challenges.

— **Designing:** Once the appropriate assistive technology tools have been identified, the next step is to design any necessary modifications or customisations to ensure that the technology meets the specific needs of the learner. This may involve adjusting settings, adding specialised features or functions, or developing custom software or hardware components.

— **Fitting:** It is important to ensure that any assistive technology equipment is properly fitted to the learner. This may involve making adjustments to the size, shape or placement of the technology to ensure that it is comfortable and effective for the learner to use.

— **Customising:** Assistive technology tools may need to be customised to meet the specific needs of the learner. This may involve adjusting settings, adding specialised features or functions, or developing custom software or hardware components.

- **Adapting:** Assistive technology tools may also need to be adapted to address changes in the learner's needs or to better support their learning and participation in non-formal adult education programmes.
- **Applying use:** Finally, it is important to provide training and support to the learner to ensure that they are able to effectively use the assistive technology. This may involve hands-on training sessions, online tutorials or other forms of support.

Training the learner to use the device

Training learners with disabilities to use assistive technology is an important part of the process to ensure that they are able to effectively use the technology to support their learning and participation in non-formal adult education programmes. Here are some steps that can help in training learners with disabilities to use assistive technology:

— **Start with the basics:** Start by teaching the learner the basics of how to use the assistive technology, including how to turn it on and off, how to navigate menus and options, and how to adjust settings and preferences.

— **Provide hands-on practice:** Provide the learner with plenty of hands-on practice in using the technology, including guided exercises and independent exploration. Encourage them to experiment and try different features and functions.

— **Customise the technology:** As the learner becomes more comfortable using the technology, customise it to meet their specific needs and preferences. This may involve adjusting settings, adding specialised features or functions or developing custom software or hardware components.

— **Use real-life examples:** Use real-life examples to help the learner understand how the technology can be used to support their learning and participation in non-formal adult education programmes. For example, demonstrate how the technology can be used to take notes, access digital materials or participate in group discussions.

— **Provide ongoing support:** Provide ongoing support to the learner as they continue to use the technology, including troubleshooting common issues, providing technical assistance and helping them adapt to new features and functions as needed.

— **Monitor progress:** Monitor the learner's progress and evaluate their use of the technology on a regular basis. Provide feedback and make adjustments as needed to ensure that the technology is meeting their needs and preferences.

Hands-on training on software for people with sight loss
source https://www.flickr.com/photos/radlicek/49025873566/

Training for professionals

Training and technical assistance can be critical in ensuring that professionals, employers and others who provide services to learners with disabilities are able to effectively support their needs. Here are some steps that can be taken to provide this training and technical assistance:

— **Identify training needs:** Conduct assessments to identify the specific training needs of the professionals, employers or other individuals involved in the major life functions of the learner with disabilities. This may involve evaluating their current knowledge and skills related to assistive technology and disability services.

— **Develop training programmes:** Develop training programmes that address the identified needs of the professionals, employers or other individuals involved in the major life functions of the learner with disabilities. These training programmes should be designed to provide a solid foundation of knowledge and skills related to assistive technology and disability services.

— **Provide training:** Deliver the training programmes in a format that is accessible and effective for the professionals, employers, or other individuals involved in the major life functions of the learner with disabilities. This may involve a combination of in-person training, online training and ongoing technical assistance and support.

— **Evaluate effectiveness:** Evaluate the effectiveness of the training programmes on an ongoing basis to ensure that the professionals, employers or other individuals involved in the major life functions of the learner with disabilities are acquiring the knowledge and skills needed to effectively support the learner’s needs.

— **Provide ongoing technical assistance:** Provide ongoing technical assistance and support to the professionals, employers or other individuals involved in the major life functions of the learner with disabilities to ensure that they are able to effectively implement the knowledge and skills acquired through the training programmes.

Hands-on training for professionals on 3D printing and its use in non-formal education
source https://www.flickr.com/photos/radlicek/49025822456/

Coordinating therapies, interventions or services with assistive technology

Assistive technology devices can be an important component of a comprehensive education or rehabilitation plan for learners with disabilities. Coordination with other therapies, interventions or services can help ensure that the assistive technology is integrated effectively into the learner's overall plan.

Here are some steps that can be taken to coordinate and use other therapies, interventions or services with assistive technology devices:

— **Collaboration:** Collaborate with the learner's support network, such as their healthcare providers, educators and therapists, to ensure that the assistive technology is integrated effectively into their overall plan. This may involve regular communication and sharing of information between the various providers.

— **Assessment:** Conduct assessments to identify the learner's specific needs and determine how the assistive technology can be integrated with other therapies, interventions or services. This may involve evaluating the learner's current education or rehabilitation plan and identifying how the assistive technology can support those goals.

— **Training:** Provide training to the learner and their support network on how to effectively use the assistive technology and coordinate it with other therapies, interventions or services. This may involve identifying specific strategies for integrating the assistive technology into existing therapies or interventions.

— **Evaluation:** Evaluate the effectiveness of the assistive technology and its integration with other therapies, interventions or services on an ongoing basis. This may involve regular assessments and adjustments to the overall plan as needed to ensure that the learner is making progress toward their goals.

Maintenance, repair and replacement as needed

Maintaining, repairing or replacing assistive technology is important to ensure that the technology continues to function properly and meet the needs of the learner with disabilities. Here are some general steps that can be taken:

— **Maintenance:** Assistive technology should be maintained on a regular basis to ensure that it is functioning properly. This may involve cleaning, testing and calibrating the technology as needed. Regular maintenance can help prevent issues from arising and extend the lifespan of the technology.

— **Repair:** If an assistive technology device breaks or stops working properly, it may need to be repaired. This may involve contacting the manufacturer, an authorised repair service, or an IT specialist to troubleshoot and repair the issue. Some assistive technology may also have warranties or service contracts that can provide repair services.

— **Replacement:** Assistive technology may need to be replaced if it becomes outdated or if the learner's needs change. In this case, it is important to work with the learner and their support network to identify the appropriate replacement technology and to ensure that it is properly integrated into their learning and assistive technology system.

— **Budgeting:** It is important to consider the cost of maintaining, repairing or replacing assistive technology when planning for non-formal adult education programmes for learners with disabilities. This may involve budgeting for regular maintenance or repair costs, as well as planning for replacement technology as needed.

Universal Design for Learning (UDL)

The theory of Universal Design for Learning (UDL)

Universal design for learning (UDL) is an approach for designing educational environments and curricula that are effective and accessible for all learners. It provides a set of **principles for curriculum development** that can create the conditions needed for every learner to study and succeed by eliminating barriers to learning.

The UDL theory is based on the idea that all learners are unique, and that education should be flexible and adaptable to meet the diverse needs of all learners. This means that educational materials and environments should allow learners to access and engage with the content in a way that works best for them. So, instead of expecting learners to fit into a one-size-fits-all educational system, UDL seeks to create **inclusive, equitable and accessible** learning environments that can adapt to the unique needs and abilities of each learner, regardless of their learning style, physical or sensory abilities, disability, age, gender or cultural and linguistic background.

UDL aims to remove barriers to learning through the development of flexible learning environments, including the **goals, assessments, methods, materials** and **physical environments**. The educators are encouraged to identify barriers to learning in the **design of the environment**, not in the learner.

UDL can support educators to intentionally design learning experiences that are inclusive for each and every learner. Here are some examples:

— The educators can use UDL principles to guide their instructional planning and decision-making. This can help them to think more deeply and systematically about the diverse needs of their learners and to design learning experiences that are flexible, customisable and accessible to all.

— UDL encourages educators to anticipate and address the potential barriers and challenges that their learners may face, and to prepare the necessary support and accommodations to help all learners succeed.

— UDL helps educators to create learning environments that are engaging, challenging and supportive for all learners. By using a variety of instructional strategies and technologies, and by providing learners with multiple ways to access and engage with the material, educators can create learning experiences that are inclusive and meaningful for all learners.

> UDL at a Glance https://www.youtube.com/watch?v=bDvKnY0g6e4 (YouTube video)

The fundamental principles of UDL

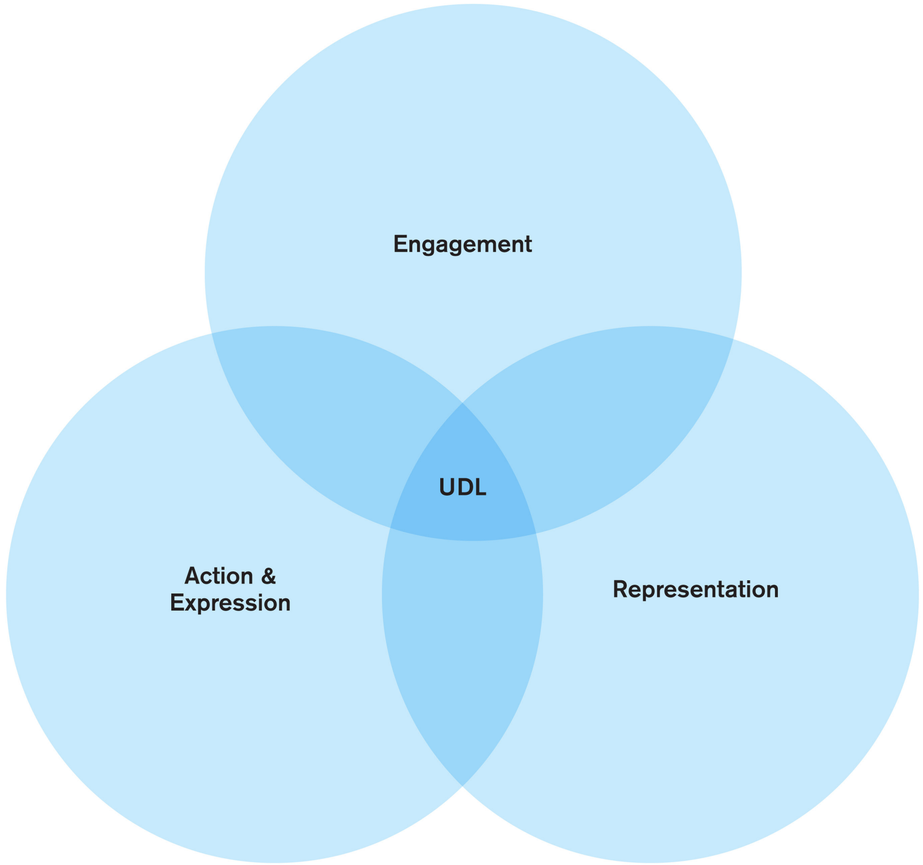
UDL is based on three fundamental principles:

— **Provide multiple means of engagement:** creating learning environments and activities that are interesting, challenging and engaging for all learners. For example, a trainer might use a combination of text, images and videos to explain a concept, or provide written instructions alongside an audio recording or a demonstration.

— **Provide multiple means of representation:** making sure that information is presented in a variety of formats, such as through visual, auditory and tactile channels, so that all learners can access and understand it. For example, a trainer might use games, simulations and hands-on activities to help learners learn a concept, or provide them with real-world problems to solve that are relevant to their lives and interests.

— **Provide multiple means of expression:** giving learners a variety of ways to demonstrate their learning, so that they can show what they know and can do it in a way that is comfortable and natural for them. For example, a trainer might allow learners to choose between writing an essay, creating a presentation or making a video to present their work.

By applying these principles, trainers can create instructional materials and environments that are flexible, customisable and accessible to all learners. This can help ensure that all of them have an equal opportunity to learn and succeed in the classroom.


Engagement
UDL
Action &
Expression
Representation

UDL strategies and techniques

The **UDL Guidelines** (https://udlguidelines.cast.org), developed by CAST, aim to support the design and implementation of curriculum components that are accessible and effective for all learners. These consist of the three fundamental principles and a set of specific checkpoints that provide practical guidance for applying the principles in educational settings. Each principle is accompanied by three guidelines on using resources and tools to improve learning. Each guideline has supporting checkpoints, which are practical strategies and suggestions for trainers to consider as they design their training within the UDL framework.

The UDL Guidelines provide a systematic and flexible approach to curriculum design and instruction, and they can be applied at all levels of education, from early childhood to adult education. They can be mixed and matched according to specific learning goals and can be applied to particular content areas and contexts, in any discipline or domain.

A useful tool for Adult Education trainers is the **UDL Guidelines Graphic Organizer**, which can help them to design lessons and assessments in accordance with the UDL principles. It provides a framework for identifying the goals and objectives of a lesson, as well as the specific UDL Guidelines that can be applied to support the diverse needs of learners. It is available on the CAST website in various languages and can be freely downloaded, printed and used.

Universal Design for Learning Guidelines

	Provide multiple means of **Engagement**	Provide multiple means of **Representation**	Provide multiple means of **Action & Expression**
	Affective Networks The "WHY" of learning	Recognition Networks The "WHAT" of learning	Strategic Networks The "HOW" of learning
Access	Provide options for **Recruiting Interest** (7) • Optimize individual choice and autonomy (7.1) • Optimize relevance, value, and authenticity (7.2) • Minimize threats and distractions (7.3)	Provide options for **Perception** (1) • Offer ways of customizing the display of information (1.1) • Offer alternatives for auditory information (1.2) • Offer alternatives for visual information (1.3)	Provide options for **Physical Action** (4) • Vary the methods for response and navigation (4.1) • Optimize access to tools and assistive technologies (4.2)
Build	Provide options for **Sustaining Effort & Persistence** (8) • Heighten salience of goals and objectives (8.1) • Vary demands and resources to optimize challenge (8.2) • Foster collaboration and community (8.3) • Increase mastery-oriented feedback (8.4)	Provide options for **Language & Symbols** (2) • Clarify vocabulary and symbols (2.1) • Clarify syntax and structure (2.2) • Support decoding of text, mathematical notation, and symbols (2.3) • Promote understanding across languages (2.4) • Illustrate through multiple media (2.5)	Provide options for **Expression & Communication** (5) • Use multiple media for communication (5.1) • Use multiple tools for construction and composition (5.2) • Build fluencies with graduated levels of support for practice and performance (5.3)
Internalize	Provide options for **Self Regulation** (9) • Promote expectations and beliefs that optimize motivation (9.1) • Facilitate personal coping skills and strategies (9.2) • Develop self-assessment and reflection (9.3)	Provide options for **Comprehension** (3) • Activate or supply background knowledge (3.1) • Highlight patterns, critical features, big ideas, and relationships (3.2) • Guide information processing and visualization (3.3) • Maximize transfer and generalization (3.4)	Provide options for **Executive Functions** (6) • Guide appropriate goal-setting (6.1) • Support planning and strategy development (6.2) • Facilitate managing information and resources (6.3) • Enhance capacity for monitoring progress (6.4)
Goal	**Expert Learners** who are...		
	Purposeful & Motivated	**Resourceful & Knowledgeable**	**Strategic & Goal-Directed**

UDL Guidelines Graphic Organizer
source: https://udlguidelines.cast.org/

UDL strategies are educational methods and tools aligned with the UDL Guidelines and can be used by trainers to reduce learning barriers and ensure that ALL learners have an equal opportunity to learn. Some examples:

— **Use of multimedia** to engage learners with various learning styles and to offer options for reading, watching, listening, designing and visualising. It also increases attention span, helps 3D visualisation and can trigger various sensory learning abilities.

— **Incorporating movement activities** to increase vitality and alertness and to engage all learners, including those who have a short attention span.

— **Giving the opportunity to move** — it helps learners with bipolar or other mental disorders to calm down and helps to get back attention.

— Use of **flexible assessments** to keep learners engaged and motivated.

— **Supporting risk-taking** — it helps learners to engage their diverse abilities.

— **Reading texts aloud/highlight it** to help learners with low vision and with limited language proficiency. This also helps poor readers.

— **Use text-to-speech while typing** to help visually impaired learners and basic-level readers.

— **Reducing content in a page** to help learners to focus and acquire attention. This also helps learners with ADHD, bipolar or anxiety.

— **Supporting vocabulary with pictures** to help learners with cognitive disabilities, language disabilities and limited language proficiency.

— **Use clip art/graphics/photos as an alternative to drawing** to support learners with fine motor deficits

— **Use closed captioned videos** to support learners with a hearing impairment. This also helps bipolar learners to reduce distractions.

There are many different techniques to implement UDL and they should be considered for all curriculum components. Some examples are given below.

UDL techniques that help to provide multiple means of engagement:

— Group discussions
— Use of different teaching methods
— Presentations
— Role playing
— Online discussion boards and study chat rooms
— Concept maps

UDL techniques that help to provide multiple means of representation:

— Use of different activities: tactile, kinaesthetic, auditory and visual
— Use of different learning materials:
online resources, videos, podcasts, presentations, realia, manipulatives, e-books, etc.
— Animations, diagrams, interactive Digital Learning Objects

UDL techniques that help to provide multiple means of action & expression:

— Choice of assignment content and format
— Creating videos
— Blogs, journals, presentations
— Multimedia projects
— Online exercises

UDL implementation in Adult Education

Adult Education (AE) trainers can apply UDL in order to adapt their training to the vast variability of their learners, without changing what they teach, by leveraging the flexibility and the variety of training methods, materials and learning activities. In addition, UDL provides various ways to introduce informal aspects into AE.

The previously described guidelines, strategies and methods can be successfully applied to all the four interrelated components of a UDL curriculum:

— **Goals:** the learning objectives that the trainer wants the learners to achieve

— **Materials:** the resources and tools that learners will use to access information, engage with the content and demonstrate their learning.

— **Methods:** the instructional strategies and approaches that the trainer will use to support learners' learning trajectories.

— **Assessment:** the ways in which the trainer will evaluate learner's learning trajectories and progress.

The goals must be directly correlated with essential real knowledge and skills in order to motivate learners for learning progress. They should be attainable by different learners in different ways and unnecessarily prescriptive or narrow methods towards achieving goals should be avoided.

To be effective in Adult Education settings, the learning goals should:

— separate the means from the ends
— address variability in learning
— provide options in terms of materials, methods and assessments

The training materials may include books, videos, websites, interactive software and other multimedia resources. They can pose a series of barriers to learning, and the trainer should take this into consideration. For example:

— **text-based materials** (textbook/handouts)
may not be accessible to learners with visual impairment or to those
unable to decode and comprehend written text or to process visual information

— **audio-based materials** (lectures/video)
may not be accessible to learners with hearing loss or those
physically or cognitively unable to take notes

— **image/graphic-based materials** (video/handouts)
may not be accessible to learners with visual impairment and to those
unable to process visual information

Consequently, a variety of training materials should be provided in order to offer learners alternatives to be engaged, learn and demonstrate what they know. Flexible training materials and media should be used. A very good example is the digital text, which can be manipulated to become accessible to more learners: increase the font size, use the text-to-speech feature, highlighting text as it is read, etc.

Other flexible media: digital visual media, audio tools, software applications, online tools, etc.

Also, alternate materials or media, such as scaled models, tactile materials, etc., should be used whenever possible.

Trainers should use a variety of training methods that appeal to all learners. These may include direct instruction, inquiry-based learning, problem-based learning, project-based learning and other instructional approaches that are appropriate for the subject matter and the learners' abilities and interests. The learning content and information should be presented in multiple ways to help learners master the content.

The assessment should be aligned with the goals of the curriculum, provide flexible opportunities to demonstrate knowledge or a skill, allow for scaffolds and supports, and be conducted in an ongoing manner. Multiple formative and summative assessment methods should be considered, in order to enable all learners to choose how to demonstrate their learning. These may include quizzes, exams, projects, portfolios and other performance tasks.

Identifying and harnessing the potential of new technologies in educational programmes for adults

Universal design and the new technologies

Universal Design (UD) is the design of products, services, technologies, environments, etc. to make them **usable** to the greatest extent possible by all people regardless of their age, size, ability or disability. It aims to design technologies that can be used by as many people as possible: mainstream technology for everyone. The focus is on avoiding unnecessary special solutions and accommodations. A universally designed technology is accessible, usable and inclusive.

New technologies have a huge potential for supporting the needs of persons with disabilities (PWDs) in many ways. They can help break the barriers for PWDs, providing them with greater access to education and offering customised solutions.

In this material, by ‘new technologies’ we mean those advanced or new developments within the field of assistive technologies (AT), expressed in specific applications and products. These AT developments are made possible by one or a combination of several underlying technologies called ‘enabling technologies’, such as Artificial Intelligence (AI), Augmented and Virtual Reality (AR/VR), robotics, Internet of Things (IoT), etc.

A good example of new technology is a high-tech wheelchair enabled by technologies such as AI, Brain-Computer Interface, robotics, IoT, advanced sensors and autonomous vehicles. These enabling technologies make possible advanced features such as:

— Wheelchair control by user's brain

— The wheelchair can move autonomously with the help of AI

— Advanced sensors can detect user's falling, objects obstructing movement, the need for emergency braking, etc.

— The wheelchair and the user are connected through IoT and can communicate in real-time alerts and other important information

— Safety distance maintenance feature

— Intelligent driving mode shifting

The rapid development and availability of enabling technologies is pushing the boundaries of AT as more and more of these revolutionary technologies are integrated into assistive products. Therefore, trainers interested in this field need to constantly look for the latest advancements.

Internet of Things (IoT)

IoT is the network of connected physical objects (things) that are embedded with sensors, software and other technologies that enable them to collect and exchange data with each other and with external systems over the internet. These objects, also known as ‘smart’ or ‘connected’ devices, can include anything capable of connecting to the internet and able to transfer data over the network, such as smart home appliances, wearables, cars, industrial machinery, medical equipment, transportation systems and more.

One of the main characteristics of the IoT is the ability for these devices to communicate and interact with each other without the need for human intervention. This allows for automation and increased efficiency in a variety of applications.

IoT devices are able to generate and share vast amounts of data, which can be used to gain insights, make predictions and drive decision making in various sectors. However, the sheer amount of data and the potential for large-scale data breaches also raises concerns about privacy and security.

Artificial intelligence (AI)

AI is the ability of a computer or machine to mimic human intelligence and perform tasks that typically require human cognition, such as learning, problem-solving and decision-making.

One of the main characteristics of AI is its ability to learn and adapt to new situations. Through machine learning algorithms and large amounts of data, AI systems can improve their performance over time and become more efficient at completing tasks.

The AI ability to process and analyse vast amounts of data quickly and accurately allows AI systems to identify patterns and make predictions that would be difficult or impossible for humans to do on their own.

AI systems often have the ability to interact with their environment and make decisions based on the information they receive. This can include natural language processing, which enables AI systems to understand and respond to human speech, as well as other forms of input such as images and sensory data.

3D printing (3DP)

3D printing, also known as additive manufacturing, is an umbrella term for a set of technologies that create physical objects from digital models. It involves using a computer-controlled machine called a 3D printer to deposit layers of material on top of each other until the object is created.

There are many 3DP technologies, using various forms of materials and energy sources and using a wide range of 3D printers. The different 3DP technologies can use various types of materials, including plastics, metals, concrete, ceramics, etc.

3DP can create complex shapes and structures that would be difficult or impossible to manufacture using traditional methods. It produces customised objects that are tailored to specific applications or requirements.

With 3DP, objects can be produced quickly and with minimal waste compared to traditional manufacturing processes that often involve cutting and shaping materials. In addition, 3D printing can reduce the need for large-scale production and inventory, as objects can be produced on-demand and on a small scale. This allows for greater flexibility and responsiveness in manufacturing, as well as reduced costs and environmental impact.

Virtual reality (VR)

VR is a technology that allows users to experience a computer-generated environment as if it were real. This is typically achieved through the use of special equipment, such as a VR headset or other device that displays images in 3D and provides sensory feedback, e.g. sound and touch. A person using VR equipment is able to look around the artificial world, move around in it, and interact with virtual features or items.

VR is able to create immersive environments that can be experienced as if they were real. This allows users to interact with virtual objects and environments in a natural and intuitive way.

Also, VR can enable new forms of communication and collaboration by, for example, creating virtual meeting spaces where people can interact with each other and with virtual objects in a shared environment. It is used in a variety of applications, such as gaming, education, training and healthcare.

Augmented reality (AR)

AR is a technology that overlays digital information and images on top of the real-world environment. This is typically achieved through the use of computer-generated objects that appear to coexist in the same space as the real world.

AR can enhance the user's perception of the real world by adding digital information and images to it. This allows users to see additional information and context about the objects and environments around them.

AR enables new forms of interaction and engagement by, for example, creating interactive games and experiences that combine the real world with digital elements. It is used in a variety of applications, such as education, training and entertainment.

Robotics

Robotics is a branch of science and engineering that deals with the conception, design, construction, operation and use of robots. Robots are typically automated machines that are capable of moving, sensing and interacting with their environment in order to perform a variety of tasks, with little or no human intervention.

Robots can perform tasks that are dangerous, tedious, or impossible for humans to do on their own, such as exploring hazardous environments, performing complex surgeries or working in harsh or inaccessible locations.

Robots can use AI to learn, adapt and make decisions, and to improve their performance over time and become more efficient at completing tasks.

Robotics is used in a wide range of applications, such as manufacturing, healthcare, transportation and defence. It allows for new and unique ways of automating and improving various processes and operations.

Brain-Computer Interface (BCI)

BCI is a computer-based system that allows a person's brain activity to control an external device or computer. This is typically achieved through the use of sensors that are placed on the person's scalp or implanted in their brain, which can detect brain activity and translate it into commands that are transmitted to an external device, such as a computer, robotic limb, wheelchair, etc. BCI allows control devices without verbal or physical interaction.

BCIs can enable persons with severe physical disabilities to communicate and interact with the world. For example, a person who is unable to move their limbs may be able to use a BCI to operate a computer or other device.

BCIs have the potential to improve or restore brain function. For example, a BCI could be used to stimulate specific areas of the brain in order to improve cognitive abilities or to treat conditions such as epilepsy or Parkinson's disease.

Wheelchair controlled by BCI
image source: EPFL, www.epfl.ch

The assistive potential of new technologies

The assistive potential of IoT

IoT-based technologies can support persons with disabilities in their daily lives. They can be used to develop assistive devices and systems that can help PWDs to communicate, move and interact with their environment more easily and effectively. IoT enables data generation, processing and storing on a large scale, thus supporting many advanced assistive technologies.

IoT technologies, such as environmental sensors, smart objects and wearables, can provide inclusive and assistive information services in near real-time and improve access to learning for PWDs.

IoT devices can be interacted with smartphones and, as smartphones generally include AT features and are widely available, the IoT potential applications for improving access to learning for persons with disabilities is huge.

IoT can provide an inclusive learning environment where learners with special needs can learn at their own pace. Examples of IoT-enabled assistive technologies:

— voice assistants
— speech-to-text tools
— smart devices to assist PWDs and provide disability specific monitoring
— smart sound and light adjustment
— IoT wearables to collect data to help customise the learning environment

IoT can be used to develop smart home systems that can be controlled through voice commands or other forms of input. This can help persons with mobility impairments to control lights, appliances and other devices without needing to physically interact with them.

In addition, IoT can be used to develop wearable or portable devices that can provide PWDs with additional sensory information or feedback. For example, a device could vibrate to alert a person who is blind or has low vision of obstacles in their path — or provide haptic feedback to a person who is deaf or hard of hearing to help them understand spoken words.

The assistive potential of AI

AI already enables numerous educational tools aimed at helping persons with vision, hearing, mobility and learning disabilities, and at improving access to learning for PWDs. Many of the apps we currently use have AI capabilities that increase their accessibility.

Here are some examples of AI-enabled technologies that can remove learning barriers for PWDs:

— image recognition and facial recognition for visually impaired learners
— lip-reading recognition and sign language translation for learners with a hearing impairment
— text summarisation for learners with reading difficulties
— real-time captioning or translations for learners with a hearing impairment or even for those who don’t speak the language
— optical character recognition (OCR) to digitise text from a paper format

AI-based technologies can be used to develop natural language processing (NLP) systems that can help persons with speech or language impairments to communicate more effectively. These systems can use speech recognition and synthesis technologies to convert spoken words into text and vice-versa, allowing persons with speech impairments to communicate through writing or typing, and allowing persons with language impairments to understand spoken words.

In addition, AI-based technologies can be used to develop smart home systems useful for PWDs.

AI-powered smart glasses
image source: https://www.letsenvision.com/

The assistive potential of 3D printing

3D printing can be used to develop and fabricate a variety of assistive devices and systems, including ones that improves access to learning for persons with disabilities. The 3D-printed devices are usually more affordable and more customisable than manufactured versions.

The applications of 3DP in AT are typically related to the manufacturing of prostheses and other AT products. Examples of 3DP applications in education:

— tactile learning aids for visually impaired learners
— various learning artefacts
— customised AT devices
— AT for learners with special learning needs

For example, a 3D-printed device could be used to hold a pen or pencil for a person with limited hand movement, or to provide additional support for a person with limited mobility.

3D printed assistive device
image source: https://makersmakingchange.com

The assistive potential of AR/VR

AR and VR have many potential applications as AT to support the needs of PWDs. VR can provide a safe environment for practising various skills while AR can make physical environments more accessible by adding virtual elements.

Educational VR experiences can help learners who are struggling to master content from a textbook or lecture. Also, learners with autism or intellectual disabilities can practise new skills in real-world situations in a safe environment.

AR has the ability to catch the interest of learners with disabilities or with special educational needs. It can also provide assistance for each level of visual impairment.

Thanks to the wide availability of AR-capable devices (smartphones, tablets, computers) and apps, implementing AR in the classroom is relatively inexpensive.

AR and VR technologies can be used to develop simulations and training programmes that can help persons with disabilities to learn new skills or improve their existing abilities. This can include activities such as driving a car, using public transportation or performing daily living tasks such as cooking or cleaning.

In addition, AR and VR technologies can be used to provide PWDs with additional sensory information or feedback. For example, a VR headset could be used to provide a person who is blind or has low vision with a simulated visual environment, or to provide a person who is deaf or hard of hearing with simulated auditory information.

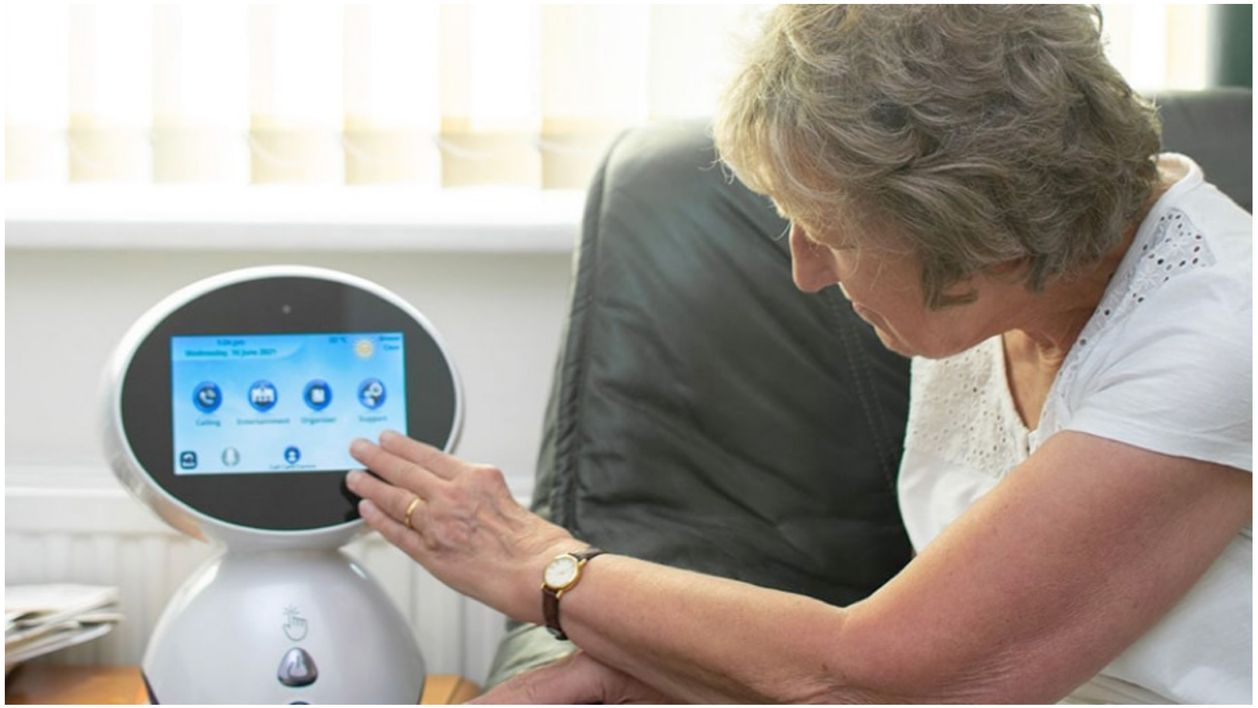
The assistive potential of robotics

Robotics is driving the development of various assistive products to help increase users' independence. Among these, the assistive robots (which can sense, process sensory information and perform actions that benefit PWDs) and the educational robots can help increase the accessibility of learning.

Robots can help teach social and educational skills to all learners. They can provide individualised education programmes for learners with disabilities such as autism, emotional and behavioural disorders.

Robotics technologies can be used to develop assistive devices that can help persons with mobility impairments to move around more easily. These could include exoskeletons or other wearable devices that provide additional support and power to the user's limbs, or wheelchairs that can be controlled through voice commands or other forms of input.

In addition, robotics technologies can be used to develop assistive devices that can help persons with cognitive or sensory impairments to communicate and interact with the world around them. For example, a robotic system could be used to convert spoken words into text or visual images for a person with a hearing or visual impairment, or to provide additional sensory feedback for a person with a sensory processing disorder.



Assistive robot
image source: https://www.genieconnect.co.uk/

Implementation of new technologies in Adult Education

The new technologies have the ability to make Adult Education more inclusive, in many ways.

IoT can enhance AE by changing how data is gathered and interfaced with users and automated processes. It allows trainers to create an environment that supports the acquisition of knowledge in a natural and efficient manner. It can impact the training but also other processes, from administration to building maintenance.

Adults who live in rural areas or who have disabilities that make it difficult for them to attend in-person classes can use IoT devices to connect to online learning platforms and access course materials from anywhere. Additionally, IoT sensors and other technologies can be used to gather data about learners' needs and preferences, which can help educators to tailor their teaching strategies and create more personalised learning experiences.

AI-powered learning platforms can provide personalised learning experiences that are tailored to each individual learner's needs and abilities. This can help to ensure that all learners are able to access educational materials at their own pace and in a way that is most effective for them. Additionally, AI-powered tools such as natural language processing and machine learning algorithms can be used to create educational materials that are more engaging and interactive, making it easier for learners to retain information and stay motivated.

3DP can be used to create personalised learning materials for individuals with learning disabilities or for those who are unable to access certain types of educational resources. It can also be used to create affordable unique, complex and customised assistive devices or learning aids (such as tactile diagrams or models, that can help learners with a variety of different learning styles).

AR and VR can be used to create immersive learning experiences that allow learners to engage with educational content in a way that is more interactive and engaging. This can be especially beneficial for learners with learning disabilities or for those who may benefit from a more hands-on approach to learning. Additionally, AR and VR technology can be used to create virtual environments that simulate real-world scenarios, allowing learners to practise and apply their knowledge in a safe and controlled setting. This can be especially useful for learners who may not have access to certain types of educational resources or who may need to learn skills that are difficult to practise in the real world.

AR/VR-based technologies allow PWD learners to take part in learning tasks safely and relatively free from the constraints imposed by their disability, to overcome their physical limitations and to develop their knowledge, skills and attitudes in safe spaces. They also enable personalised and distraction-free learning, support learners with special needs and can supply new and formerly impossible experiences, in a safe environment.

Robotics can be used to create interactive, hands-on learning experiences that can engage learners with a variety of different learning styles. This can be especially beneficial for learners with learning disabilities or for those who may benefit from a more kinaesthetic approach to learning. Learners could use robotics technology to remotely control robotic devices in a classroom or laboratory, allowing them to participate in experiments and other hands-on learning activities even if they are not physically present in the same location.

By leveraging the power of new technologies, adult educators can help to break down barriers, make education more accessible to a wider range of learners and create more inclusive learning environments that are accessible to learners of all abilities and backgrounds.

Best practices

Some examples of best practices when training adults according to the UDL Guidelines are given below.

To recruit AE learners' interest:

— Set clear learning goals
— Listen to your learners
— Explain the connections between learning outcomes and learners
— Create a safe learning environment
— Use repetitive routines

To sustain AE learners' effort and persistence:

— Check often with your learners to confirm understanding and progress
— Show learners how to collaborate
— Encourage learners to set up and run groups
— Give formative feedback frequently

To help learners develop self-regulatory skills:

— Use your own experience to show learners how everyone starts from a beginner position; treat failures as opportunities for growth
— Give learners coping examples
— Divide your lectures into small sections

To ensure that key information is equally perceptible to all learners:

— Provide alternatives for visuals and audio
— Offer ways to customise the display of information

To ensure that all learners correctly understand the language and symbols used during classes:

— Clarify syntax and structure
— Clarify vocabulary and symbols to be used
— Check with your learners on a regular basis that they have understood
— Use technologies that create alternatives to language and symbols

To ensure that all learners correctly comprehend the delivered information:

— Activate or supply background knowledge
— Highlight patterns, critical information, big ideas and relationships
— Guide information processing and visualisation

To provide options for physical action:

— Add options that allow for different physical responses
— Allow flexibility in the pace of learning
— Support learners in using no-tech, low-tech and high-tech options
— Check for learner understanding regularly
— Make sure you test only the learners' skills that you wish to test

To provide options for expression and communication:

— Provide alternatives to pen, paper and talking
— Allow and support learners to use technological help when expressing themselves
— Create multiple paths for learners to show their skills

To provide support development of executive functioning:

— Guide learners to set and express goals
— Support planning and strategy development
— Provide scaffolds for performance
— Show learners how to give and receive feedback
— Give learners guides and opportunities to perform peer and self-assessment

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Closing thoughts

From the point of view of the rigidity of the educational systems and the possibility of integrating drastic changes within the educational sphere, there is a significant gap between general education and adult education. Adult education, especially the non-formal type, has, in this sense, more manoeuvre for free experimentation for inserting the aforementioned levels of inclusion into educational practice for all learners. However, the ambition that this sort of inclusive education, based on all kinds of inclusion, is established only within adult and non-formal education, raises a dilemma. If inclusive education takes place mainly within adult education, no real breakthrough is realistic toward incorporating inclusion into the educational environments in contemporary society. The reality of incorporating more elements of inclusion within education, not only for learners with disabilities but for all learners, could happen if the central message of inclusive education vis-a-vis the necessity of adapting the education systems and processes to the learners and their intrinsic potential garners more attention within the overall educational environment. Under such development scenarios, assistive and new technologies would get an additional boost towards supporting learners in the direction of a more inclusive educational environment. However, realistically, it seems at this point that drastic changes in a short time within formal education systems are hardly possible where systematic attention would go to the inclusive education concept. That is why it is very important nowadays that at least adult education (with an emphasis on non-formal education) systematically incorporates the inclusive education paradigm in its educational environments. By focusing on learners with disabilities, Project IEDA, including this Handbook, is striving to pursue these ambitions and thereby pave the way for more inclusive education for all learners in general.

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