

Active Education in Older Adults with the Use of Smart Technologies

Jana Šolcová – Miroslava Tokovská – Tímea Šeben Zaťková (Eds.)





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orientation of children, youth, and the adult population. She actively carries out field research and related data analysis, mainly in the form of qualitative research design.

PREFACE

This book is an open resource textbook with the title 'Active Education in Older Adults with the Use of Smart Technologies'. It is provided electronically to maximise sustainability, provided without cost, and is available to higher education institutions within helping professions. This book was written by university lecturers with experience in education, social work, public health, psychology, linguistics and digital programming. All the contributors to this book are highly qualified in their roles as researchers, developers, supervisors and lecturers, as well bringing years of hands-on experience. They share their knowledge in a thought-provoking, engaging and insightful way, encouraging readers to consider the implications of his or her current circumstances. Higher education institutions are constantly-changing dynamic systems and strive to be innovative, to create sustainable projects focused on development, and to adapt to new societal trends.

This book aims to provide an overview of 'smart active ageing' for future helping professionals, as well as experts in practice such as educators for adults and older adults, social workers and healthcare workers, within public health areas. The ambition of the authors is to strengthen professional competencies in terms of identifying educational needs, planning, implementing, and evaluating the necessary support as part of the concept of smart active ageing. A theoretical-practical approach was applied when creating the text of this textbook. Chapters within the book contain the theoretical starting points of the relevant issue.

As the result of the international project BIN SGS02_2021_002 'University Enhancing the Smart Active Ageing', supported by Norway through Norway Grants, this university book was published to serve as an aid to helping professionals working with older adults in the field of education. The main coordinator of the project is the University of St. Cyril and Methodius in Trnava, Slovakia, where this research started in the autumn of 2022. The project is supported and financed by the EEA, Norway Grants, and the state budget of the Slovak Republic, over the duration of the project contract - November 2022 to April 2024.

We hope you find this university textbook helpful and wish you all the best.

The Editors on behalf of the authorship team

INTRODUCTION

The development of the educational potential of older adults requires changes in the attitudes of society and within the older adults themselves, along with the creation of formal and informal educational opportunities. Education can be delivered through smart technology, which has become commonplace in 21st-century life and is used by people of all ages. An ageing population (often referred to as the 'silver tsunami') requires the adaptation of economic, health and social systems, as well as in the field of education. Through active education, countries can delay the negative consequences of older adults becoming socially isolated or cognitively impaired. Play-based learning is one of the new areas of education that benefits the cognitive health of the brain.

The specific educational needs of older adults depend on the possibility of funding, the competence of the relevant experts, the possibilities of educational institutions and the interest of the target group. In Slovakia, a network of universities of the third age (known as U3A) has been created. This concept is famous worldwide as a non-formal learning process through self-help interest groups, and the U3A aims to encourage older adults (aged 60-65+) to share their knowledge, skills, and interests in a friendly environment without the pressure of exams or homework. There is also a network of other opportunities for informal education within the framework of various pensioners' clubs or community centres.

The mental and physical health of older people can be positively affected by their involvement in activities. Participation in education and training can provide a sense of satisfaction, promote subjective well-being and social inclusion, and increase feelings of empowerment. Older adults can also take advantage of opportunities for personal development, maintaining cognitive health, and learning about trends on the internet and among smart technologies.

Education in the third age offers the opportunity to learn something new and to gain a deeper understanding of subjects that have not been studied in the past. The vision for Europe in 2030 is focused on sustainability and innovation, which can be supported by

active education in the third and fourth ages. It is important to innovate educational offerings for older adults at the same pace as smart technologies.

1 SILVER TSUNAMI AND THE CONCEPT OF A GREY DIGITAL DIVIDE

European countries will experience for a significant increase in the number of older adults in the near future and should start preparing in terms of economic, social, and solidarity-based policies, including in the field of education. The silver economy, grey tsunami, ageing apocalypse, ageing society, silent generation, greatest generation, traditions, veterans, and other metaphorical terms describing the ageing generation are increasingly appearing in scientific, professional, and public discourse (Abrams & von Frank, 2014; Whelehan & Gwynne, 2014). The silver economy has long been talked about as an opportunity to develop businesses aimed at the generation aged 50+ (Peng et al., 2023). In addition to the development of social and professional potential, the silver economy is also associated with the development of digital skills.

As the ageing of the population became more apparent over recent years the term 'silver tsunami' began to appear, and the negative connotations this term brings, together with societal stigma and ageism, may indicate that older adults are becoming 'something dangerous' or a burden on society (Fox, 2001). Age-related digital divides and the grey digital divide affecting older adults are described by Shi (2023), who highlights the necessity for tailored interventions and support to address the specific needs of each cohort and to reduce the disparities associated with age. Lissitsa et al. (2022) stress the significance of continuously maintaining and enriching older people's human capital by using digital technology. Despite the negative associations, older adults are living to a higher age in better living conditions and have better opportunities to maintain their health, as well as a wider range of educational opportunities, than in the past. This is particularly the case regarding the possibility of taking part in various educational activities or courses in connection with smart technologies.

Several studies (Elliot, 2019; Van Dijk, 2020; Lythreatis et al., 2022) point to visible differences between older and younger generations in the use of digital technologies and smart technologies due to older adults having limited technical skills and knowledge, motivation, and a lack of tailored education and support specifically for the older generation. According to Slovak statistics (2022), 28% of people aged 65-74 have never used the internet. Slovak statistics do not specify people aged 75+, but

research by the European Parliament (2021) measured the perceived barriers for non-internet users aged 75+ (n = 4635) as follows: lack of digital skills (56%), no internet access (26%), and no interest in using the internet (21%). These results for non-internet users are representative of all EU countries, including Slovakia. European internet users aged 75 and over use the internet for social networking (23% daily), government information (23% several times a month), online banking (40% several times a month) and online shopping (14% several times a month). Eurostat (2023) describes the high cost of access (23%), equipment (25%), or both (32%) together with lack of skills (45%), and lack of interest (45%), as the most frequently cited reasons for not having internet access at home. Lack of skills is also exacerbated by older people not owning digital devices. According to Eurostat (2023), there is still a large gap between internet users; only one in four people aged 65-74 has the necessary skills to participate in the digitalisation of society.

Smart technologies offer new ways to educate, entertain and feel well for older adults. The use of the internet is nothing new or unusual these days; however, this use of modern technologies is not common among the older population in Slovakia. As technology develops, there is progress in older people's positive acceptance and learning of new technologies (Mitzner et al., 2019; Mikhailova et al., 2024). Living safely and independently at home is the goal of most adults, and smart homes offer both the younger and older generations a greater sense of comfort, security, and worry-free living. The younger generation, however, is more likely to search for smart technologies, follow development trends and new technologies and buy such products and implement them into their daily lives; the older generation generally struggle with the integration of technology into their lives. However, reducing the feelings of stress and anxiety associated with technology (often referred to as technostress) can be achieved through education.

Smart technologies are a good educational tool, and digital game-based learning, such as the online game of Scrabble, can simplify the learning process and train memory. Such activities are referred to as game-based brain training (Wang et al., 2021) or computer-based cognitive training (Adcock et al., 2020). The generation of the Slovak silver tsunami has several opportunities to reduce the digital divide and to increase

their competencies through graceful ageing in the 21st century. Today, it is the privilege and desire of both older adults and middle-aged people to be healthy and digitally literate. The opportunity to learn from each other is a potential hidden in relationships: in families, in neighbourhoods and in friendships. Key to the whole process is helping, supporting, and understanding each other, which has its place in Europe's digitalisation process just like in human society.

1.1 Ageing Gracefully in Place for the Silent Generation

Globally, there is a need for digital solutions that can support an independent and fulfilling life for the ageing population, allowing every older adult to live as he or she would like. Reducing the economic burden of care, as well as the social and health burden on the country, is closely associated with the implementation of smart technologies in the lives of older adults and those living with illnesses. Technological developments set out to ensure the quality of life of older adults and satisfy their needs.

Attempting to introduce smart technologies into the lives of older adults can seem to be complex and time-consuming. Older people may view new technologies as overwhelming and may experience stress when using them due to rapid technological developments and the need to continuously adapt to new features or applications on improved devices. This may in turn raise concerns about the so-called 'digital divide', which is also referred to as *digital ageism* (Manor & Herscovici, 2021). Eurostat (2017) published the results of research showing that the grey digital divide (i.e., the lower tendency of older adults to use personal computers or to communicate through the internet) is significant, with only about 45% of the population aged over 65 across Europe using the internet at least once a week. This low figure is partly due to the lower level of education of older European citizens in some countries; in Portugal, for example, 77.3% of individuals over 65 have four years or fewer of education, and 84.5% of this age category have never used computers, video games or tablets (Rodrigues et al., 2018). Despite the benefits of integrating smart technologies into a person's life, there is a digital divide between younger and older generations, with the older generation generally adopting current and emerging technologies at a slower pace (Faverio, 2022). Sophisticated digital devices and rapid technological advances

are challenging older generations during the process of integrating and implementing smart active ageing. Estebansari et al. (2020) comment that in recent years we have seen the emergence of various ageing concepts, such as successful ageing, active ageing, healthy ageing, positive ageing and productive ageing; to maintain the momentum of digitally-oriented active ageing, reference should be made to all of these, and promoting and enacting an age-friendly world, cities and communities should be pursued.

The attributes of ageing are evolving along with technological progress and the development of individual societies. In this textbook, we consider the presented concepts as strategic starting points for smart active ageing. Ageing is the last stage of personal development and, like early childhood, is among the vulnerable periods of a person's life. The fragility of an older adult may deepen not only due to losses (health, social contacts, finances) but also due to significant developments in smart technologies and a lack of understanding and competence on the part of the older adult.

Maintaining independence, autonomy, and social connectedness to community services are seen as positive attributes of ageing in place (Lee & Kim, 2020). It is important to reduce feelings of loneliness and maintain a sense of security during the ageing process, which directly increases satisfaction with one's own life. These attributes help to preserve the identity of the ageing person. The question at hand is whether ageing societies are equipped for ageing in place, which involves living without hindrances and with the aid adapted interiors and exteriors. Additionally, it is important to consider how well older adults are prepared for their ageing. Are there support systems available through welfare technology that would enable ageing in place? Furthermore, what is the coordination of community services and advocacy for the rights of older adults? The following chapters attempt to answer questions about ageing by using established concepts.

1.2 The Process of Implementing Smart Active Ageing Based on Diverse Concepts

Active ageing appeared as a concept in the 1990s, with an emphasis on the connection between activity and health. It reflects the importance of psychological, psychosocial and social factors in planning interventions for supporting the adaptation to ageing, with the word *active* meaning ongoing participation in social, economic, cultural, spiritual and community issues - not just a person's ability to be physically active or continue to work (WHO, 2015). Active ageing refers to the process of optimising opportunities for health, as well as participation and safety, to improve the quality of life of the ageing population. It involves physical, social and mental activities that promote independence, comfort and the ability to contribute to society. Adopting the concept of active ageing has benefits for both individuals and society alike, including reduced healthcare costs, increased social cohesion, and productive population ageing.

The United Nations (2015) emphasises that active ageing is a right, based on human rights and the UN principles of independence, participation, dignity, care and self-realisation. The discourse on active ageing focuses on promoting the participation of older adults in society and stresses the competencies and knowledge that older people have. Active ageing overturns the 'paradigm of decline and loss' commonly linked with the consequences of bodily exhaustion, and instead accentuates the active roles that older people play in society. The UN highlights the need to distinguish between the concepts of activity and passivity, where being active means living according to one's own rules; it further emphasises the need for a more intensive holistic approach which considers factors such as quality of life, mental and physical well-being and social participation, rather than just economic ones.

The European Commission (2021) is firmly committed to connecting digitalisation with active and healthy ageing and launched the 'Blueprint' initiative, a framework for strategic cooperation between key stakeholders (e.g., businesses, trade unions, research, education and training institutions, and public authorities). This strategic vision outlined how digital innovation, enabled by the functioning Digital Single Market,

can turn demographic changes into opportunities. The aim of the Blueprint initiative - to implement prevention programmes among European older adults - requires time to be put into practice among the older citizens of the European Union.

As the population ages, the need to explore innovative solutions that can support healthy ageing grows. One solution is the incorporation of smart technologies into education. Health promotion is defined in the Ottawa Charter (1986) in Thompson et al. (2018) as the process of enabling people to raise the level of control they have over improving their health. This is a complex social and political process that involves action to strengthen individuals' skills and abilities and to change unfavourable social, environmental and economic conditions to mitigate their impact on public and individual health. Healthy ageing is the process of optimising opportunities for physical, social and mental health to enable older people to actively take part in society without discrimination, and to enjoy an independent and high-quality life. Support for healthy ageing requires multi-sector cooperation between government and non-governmental entities, community service providers, the academic community and the older adults themselves.

Healthy ageing is in everyone's best interests; it is a process of developing and maintaining functional abilities that enable well-being to be maintained at a higher age. The functional ability of an older adult person reflects his or her physical condition and mental abilities, the environment in which the older adult lives, and the ways in which he or she communicates with other people. The need for healthy ageing is a challenge for all the countries of Europe; by 2025, about one-third of the European population will be aged 60 and over, and the number of people aged 80 and over will rapidly increase. This will have an extraordinary impact on European social states. Several important arguments can be made for investing in health as a separate goal; health is considered an important determinant of economic growth and competitiveness, and investments in healthy ageing will contribute to the labour force, thereby reducing the likelihood of early retirement.

Health promotion plays an important role in ensuring healthy ageing. Many diseases in later life are avoidable, and health promotion can help older people with chronic

diseases and disabilities remain active and independent, thus avoiding institutionalisation and declining health. Evidence indicates that life can be extended and its quality improved, meaning older people can remain healthy, active, independent and productive for longer. As people grow older, their health needs tend to become more chronic and complex. These needs are not only associated with care or the ability to meet basic requirements; they are also associated with people contributing to society and achieving their personal goals, which bestows the older adult with a sense of well-being. Ensuring equal access to healthcare is crucial in reducing social inequalities in society, particularly among older adults. Healthcare and helping professionals providing support to encourage autonomy can have a positive impact on personal control, health routines, and psychological well-being in older adults. Empowering older adults to have greater control over their digital learning process fosters autonomy and prepares them for self-directed learning, which ultimately leads to personal growth and success. Autonomy and personal control are essential for well-being, decision-making, achieving personal goals, and contributing to health promotion.

Smart technology has the potential to promote healthy ageing through education. By taking advantage of the benefits of smart technology and implementing effective strategies in the fields of physical health, cognitive health, and social engagement, older adults are empowered to accept technology as a tool for lifelong learning and thus enhance their overall well-being.

The concept of *successful ageing*, as proposed by Rowe and Kahn in 1997, is based on a shift of perspective from a deficit to a resource-based ageing to overcome the dichotomy of pathological and non-pathological ageing (Plugge, 2021). On the one hand, older adults are described as people losing autonomy when performing routine daily activities. This is due to health issues, and as the health issues advance institutionalisation and/or hospitalisation is necessary, with all the negative effects these factors bring to their quality of life. On the other hand, scientists and health professionals have tried to define 'normal' ageing (non-pathological ageing) to determine the exact boundary between the functional and the dysfunctional, and thus the opposite of pathological ageing. Defining and measuring successful ageing,

however, is difficult due to the varying characteristics of older adults, such as heterogeneity. In older professional literature, satisfaction with one's past and present life was the most commonly proposed definition of successful ageing (Williams et al., 1963). Its components include having an appetite, determination and strength, happiness, relationships, desired and achieved goals, self-understanding, morale, mood and general well-being. Continuance of social functioning is another commonly proposed domain of successful ageing; this includes a high level of skills in the functioning of social roles, positive interactions or relationships with others, social integration, and reciprocal participation in society. Recommended psychological resources for successful ageing include a positive outlook and self-worth, self-efficacy or a sense of control over one's life, autonomy and independence, and effective coping and adaptation strategies concerning changing circumstances. For example, when there are limitations to what a person can do (as in the case of poor health), strategies that find new activities which maximise the available physical and mental resources need to be set in motion. Successful ageing is perceived as a dynamic process; it is the result of a person's development during the life course, demonstrating an ability to grow and learn by using past experiences to cope with current circumstances, while maintaining a realistic sense of self. Successful ageing, however, needs to be seen as an ideal state to strive for, and the concept itself should be built on a continuum of successes and not subject to simplistic normative assessments of mere success or failure (Bowling and Dieppe, 2005). Successful ageing is an inseparable part of project programmes in various European countries, such as Spain and Italy (Liotta et al., 2018). To achieve successful ageing, all aspects of the health of older people should be considered. Many problems of older adults are the result of unhealthy lifestyles adopted during their later years. Focusing on successful ageing, and adopting a healthy lifestyle, may help prevent and reduce age-related problems, and ultimately reduce the financial cost of illnesses during this period. Older people need information, support and encouragement for them to age successfully; healthcare professionals, as promoters of community health, must provide the basis for successful ageing through by designing comprehensive healthy ageing plans to preserve and promote healthy

and active living in old age. It is recommended that improving education associated with a healthy lifestyle should begin many years before actual ageing sets in.

The concept of *positive ageing* (and associated synonyms, such as optimal or vital ageing, ageing gracefully and ageing well) has a long history in the fields of research and policy. From a semantic perspective, the majority of these concepts emphasise the variety of positive conditions in and during the ageing process, such as physical fitness and health, optimal cognitive functioning, positive emotional states, and social interaction (Fernandez-Ballesteros, 2011). Research has determined that the components (i.e., individual variables/concepts) of positive ageing involve several dimensions, including physiological, social and psychosocial dimensions. However, the heterogeneous nature of positive ageing research, especially with inconsistencies in positive definitions and assessments of ageing, has also been highlighted (Pocock et al., 2023). According to Ng and Cheung (2023), positive ageing is based on the dual ethics of ageing that consists of a positive life for oneself (maintaining health and functional independence) and for the betterment of others (other individuals and society as a whole). The core is a positive life in old age to improve oneself and others. Older adults can project ethics into everyday life through their social networks, supported by inclusive institutional policies and approaches which view them as a social resource rather than reducing them to a social burden. Through positive ageing, older adults live a fulfilling life in old age. Mamen (2018) stresses that positive ageing means maintaining a positive attitude towards ageing; such an approach helps combat negative feelings towards progressively debilitating conditions, enabling older adults to enter the next phase of their life full of zest and energy. The development of positive ageing as a phenomenon of the times is an effort to create a society for all age categories that prepares for, and celebrates, the ageing process. Ageing positively is not difficult; however, the national government or the wider local community should expend the effort to make it happen.

The concept of positive ageing includes making the most of the benefits of old age and maintaining a good attitude towards life; it is also about maintaining a positive mindset throughout older age, regardless of the challenges. This kind of approach during times of loss or change can help ease the pain in these kinds of life experiences and make

life generally more satisfying. Positive ageing encompasses the full spectrum of experiences, including health, independence, financial security, self-actualisation, personal safety and the environment around us, and can be affected by attitudes and characteristics. Good key attitudes for maintaining a positive mindset as you age include remaining optimistic, learning to live with limitations, being adaptable and embracing change, wanting to maintain social relationships, having a sense of humour, desiring to live a quality life, and having awareness of the need to make the most of what is available. As a person ages, he or she may experience many life changes that are difficult to accept, such as retiring from work, needing new living conditions, adapting to changes in social networks, the death of peers, or changes to his or her health and abilities.

Older adults are a growing source of human and social capital that can be optimally used to improve the well-being of individuals, families and communities. *Productive ageing* is an umbrella term that covers the various kinds of activities that people engage in when in old age, including economic activities, formal and informal lifelong learning, volunteering, and various types of caregiving. Productive ageing means ageing well through optimising opportunities for older people. This concept is useful for promoting and optimising employment opportunities, encouraging a healthy and active lifestyle, removing barriers to community participation, and lifelong learning. Involvement in productive activities at a higher age is an effective way to slow the decline in functional capacities. The extent to which older adults engage varies from country to country, depending on the nature of the activity, prevailing cultural and social norms, social security systems, structural limitations and available opportunities. Technology opens up potentially new ways of increasing the engagement of older people in productive activities (Dommaraju & Wong, 2021).

Academic literature describes many activities as indications of productive ageing; these include paid and unpaid work, helping others, and providing care. The framework of productive activity has been described as highly successful in identifying the social, cultural and political decisions that shape the activities of older adults. Productive ageing includes activities both within and outside the labour market. According to Schulte et al. (2018), the key to productive ageing is productive engagement, and

research shows that when older individuals direct their energies and talents towards identified private and public needs they create significant benefits for themselves, as well as their families and communities. Professional literature on productive ageing also acknowledges the importance of social, cultural, political and institutional factors. These factors are important because employers of older adults need to consider health and safety in the workplace; work-related issues, such as inflexible social structures, differences in pay and work opportunities and standards, can affect the safety and health of older adults.

In many regards, the concepts of successful ageing and productive ageing are related and complement one another. While successful ageing relates to physical, mental and general well-being in advanced age, productive ageing is more closely linked with the promotion of social policies and workplace changes for older workers. Productive ageing emphasises the positive aspects of ageing – how individuals can make significant contributions to their own life, communities, organisations and society as a whole. In the context of work, productive ageing is supported by a safe and healthy work environment that allows workers to perform their jobs successfully and to prosper at any age. Productive ageing not only applies to the paid workforce; it also applies to those who are volunteers, those who serve as family caregivers, and those who strive to remain independent and self-sufficient for as long as they can. Kerschner and Pegues (1998) describe how assumptions of productive ageing reflect the reality that older adults are repositories of wisdom and experience and are important assets for a society. Older adults can be relatively healthy, with the potential to maintain this condition well into old age; as such, they are able to make economic and social contributions that benefit themselves, their families and communities, giving them the opportunity to do purposeful and meaningful tasks and activities in life. The model of activity for productive ageing emphasises engagement in paid work, volunteerism, education, fitness and exercise, leisure and travel, advocacy and political action and consumption.

1.3 The Concept of an Age-Friendly World, Cities and Communities

The development of age-friendly cities and communities has become a key component of policies focused on improving the quality of life of older people in urban areas. The World Health Organisation is at the forefront of promoting an age-friendly agenda, primarily through its global network of 1,114 age-friendly cities and communities (as of 2020). The age-friendly perspective was developed for the first time by the World Health Organisation (WHO, 2007; 2018) as a result of a project examining the experiences of older people living in urban environments. The outcome of the project was a handbook that identified the key characteristics of an age-friendly community in regard to service delivery (e.g., health services, transport), the built-up environment (e.g., housing, outdoor spaces and buildings) and social aspects (e.g., civic and social participation). This handbook has since become one of the most widely used tools for assessing the age-friendliness of cities and communities. In an age-friendly world the policies, services, settings and structures of cities and communities support and enable people to age actively by doing the following:

- Recognising the wide range of skills and resources among older people.
- Foreseeing and responding flexibly to the needs and preferences associated with ageing.
- Respecting older adults' decisions and lifestyle.
- Protecting those who are most vulnerable.
- Supporting older adults' inclusion and contribution in all areas of community life (WHO, 2018).

Smart active ageing is a phenomenon of the 21st century, and individual cities, towns and regions around the world are already taking steps to become friendlier to older people. An age-friendly environment in general means a community in which older adults are appreciated and respected; practically, they are included in and supported during basic daily activities, such as moving and shopping, as well as having access to and receiving all types of public and private services. The World Health Organisation (WHO, 2007) defines an *age-friendly world, city and community* as 'a city and community in which policies, services and structures associated with the physical and

social environment are designed to support and enable older people to age actively – that is life in security, enjoy good health and continue to participate fully in the life of society'. Age-friendly environments promote healthy and active ageing; they enable older people to age safely in their own environment, to be freed from poverty, to continue developing personally and to contribute to their communities while maintaining autonomy, health and dignity.

Remillard-Boilard et al. (2021) identified four priorities that the age-friendly movement should consider for further development: firstly, to challenge negative perceptions of older age and raise awareness of the needs of older people; secondly, to involve key agencies in age-appropriate programmes; thirdly, to respond to the needs of older people; and finally, to improve the planning and delivery of age-appropriate programmes. In addition, the researchers emphasised the benefits of conducting more empirical, comparative and cross-national studies to better understand the evolution of the age-friendly movement. Given that it continues to expand, measuring the progress of the age-friendly movement – and documenting the experiences of the participating cities – will be essential for demonstrating the benefits of an age-sensitive approach and guiding future policy and practice. Demonstrating the benefits of adopting an age-friendly approach will help to ensure that support for older people is maintained, and that the voices of older people continue to be heard and acted upon.

The WHO (2017) states that one of the basic conditions for creating age-friendly cities and communities is the meaningful participation of older people in all stages of the development process. This point – where older adults are seen as the key agents of change – is supported by research which has adopted a participatory approach to involving older people as key actors in the research and development of age-friendly communities (Buffel et al., 2012). This has shown that such an approach founded on cooperation, in which older people play a central role equal to the researchers in developing initiatives focused on age, facilitates community development and change at the local level, leading to a more welcoming and supportive community environment and increasing civic engagement and social capital (Buffel, 2018a). Chung et al. (2021) emphasised that, in an age-friendly society, older adults are encouraged to take part in productive activities, such as sharing their knowledge and expertise with younger

generations and contributing to their communities through employment or volunteer work. In return, their contribution to the society is appreciated, and the older adults are respected. Families with older adults feel less stress when an age-friendly community offers support, in addition to that offered by social and health services; local interventions and programmes, as well as national and local policies, are all relevant and helpful in enabling older adults to contribute. Common facilities in age-friendly societies are designed so that they can be used by people of different ages and interests, leading to harmonious interaction between different generations, and the media in such communities portrays older adults in a positive way without the use of stereotypes. Creating an age-friendly environment requires cooperation and coordination among various sectors and stakeholders, including older people, and should promote health and provide support for people with reduced capacities to ensure that older adults can age safely and continue to develop and contribute to preserving their autonomy and health. Around the world, the number of older adult people who need care and support is increasing significantly. Every European country needs an integrated continuum of long-term social services to preserve capabilities and satisfy the needs of older adults in specific local communities.

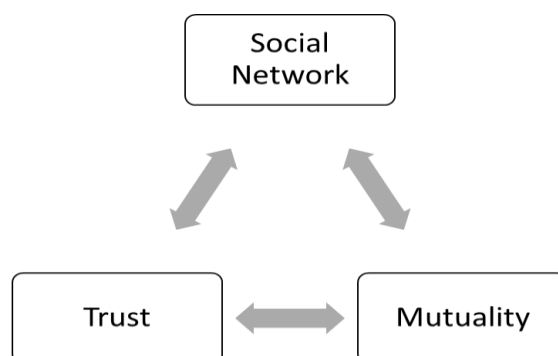
An effective strategy for smart active ageing should be based on the common contributions of the citizens and society. Foster and Walker (2015) state that, in terms of EU policy, the promotion of smart active ageing should include connecting the previously separate policy areas of employment, health, social protection, pensions, social inclusion and technology. Implementation of this approach into specific social policies would mean the transformation of a wide range of social and health policy areas, such as the labour market and health, towards a more active intervention, thus preventing the causes of individual losses and skills in the last part of life. A policy of the redistribution of resources from acute to preventive health is essential. Underpinning the idea of connecting all the previously separate policy areas is the conviction that chronological age is not an effective predictor of performance; in reality, the life cycle perspective strengthens the preventive dimension of an active ageing programme. Ageing well requires strategies that support health and well-being to be implemented before old age.

1.4 Older Adults and Social Capital in the Concept of Smart Active Ageing

Ageing does not have to be synonymous with decline; this is why it is important to reflect on old age with an interdisciplinary and comprehensive perspective. All activities performed at different stages of life have meaning and often create continuity. By examining the intrinsic impulses, interests and preferences of older individuals regarding activities and social relationships, and taking appropriate action at the right time, it is possible to positively influence the well-being and social participation of older adults. Both social and physical activities have a positive impact on mental health and quality of life. Social capital can be strengthened through open dialogue, cooperation and coordination among different groups and different cultures in a local community. Creating a resource group of older people who can lead, identify and mobilise other involved older people helps to develop local identity and social capital.

Pierre Bourdieu (1986) focused attention on non-material and non-financial capital, that is, on the mental, cultural, symbolic and social resources that contribute to people's lives. He criticised the fact that the inequality between people in social capital is covered, among other things, by the theory of capabilities. This theory serves to justify the privileges of dominant individuals and groups on the one hand, while on the other justifying the need for others to accept subordination; the inequality of people is therefore ethically and intellectually justified. According to Putnam (2000), social capital is inherently self-reinforcing and cumulative. Trust cannot solely have a personal basis; it must be supported by social resources, especially standards. The result of trust is mutual reciprocity, by which an integrated community arises. General trust gives 'courage to reciprocity' and network building. The more people come together, the more they trust one another. Reciprocity and association create trust, and thus a circle is formed (see Figure 1): trust creates reciprocity and voluntary associations of people, and reciprocity and associations reinforce and create trust. This increases social capital.

Figure 1. Understanding social capital according to Putman (2000) – own processing



Source: Own elaboration, 2024

Social capital can contribute to increasing understanding of the importance of social networks, reciprocity and trust. Local social work is largely about interpersonal and intimate relationships between people; it is a link between participation, trust, norms and networks (Olsen, 2017, p. 333). The quality of interpersonal relationships can have consequences for the individual in the local community and community work. Bourdieu (1986) defines social capital as social connections that go beyond casual interactions between individuals, emphasising that these connections must be enduring and demonstrate a level of commitment. According to Bourdieu (1986, p. 248), social capital can be thought of as a compilation of tangible or potential assets, associated with the maintenance of a stable network of relationships characterised by mutual understanding or appreciation. Social capital promotes social support; social support is a complex phenomenon that relates to cultural and relational qualities and characteristics in the social networks of businesses, local communities, groups and individuals, and it includes the help, protection and care provided to other people. It encompasses the following: psychological, emotional and spiritual support; informational, guiding and advisory services; and instrumental and practical help and support (Schiefloe, 2015). In addition to its direct meaning, social support has a buffering effect and contributes to a better quality of life, health and participation in the community through acknowledgement, the development of relationships and belonging, and increased resilience, knowledge and coping (Kokko & Hänninen, 2019). Both the donor and recipient are strengthened by social support; however, for those without such support the lack of reciprocity is a challenge to health, dignity and quality

of life (Törrönen, 2017). Experiencing, receiving, accepting and contributing valuable social support also includes interaction and communication, and its provision is demanding and can be seen as disruptive, exhausting and addictive. The benefit of available social support is associated with the recipient's changing needs and the ability of the individual donor to adapt to these needs (Kokko & Hänninen, 2019).

Educational work offers various strategies for building and maintaining social capital in older age. These involve strengthening existing relationships by prioritising quality time with loved ones, encouraging open communication, and increasing trust, all aspects that are important strategies of social capital. Expanding social networks through the membership of various clubs and interest groups is another strategy with similar goals, as is participation in community events and meetings. The potential for the development of social capital of older adults can have a direct positive impact on overall well-being, assuming they learn and adapt to new technologies and take advantage of digital platforms for social connections.

1.5 Trends and Challenges of Smart Active Ageing

Older adults may face a variety of challenges when accessing educational opportunities, such as negative experiences with outdated teaching methods which could make them reluctant to take part, limited physical mobility, their mental capacity, and reduced social interactions. Concerns and fears related to using new technologies are also common. Smart technologies offer innovative solutions to support active ageing in education because they include the many possibilities offered by digitally connected devices, applications and platforms. Smart technologies are revolutionising traditional teaching methods in the context of educational opportunities and opening new avenues for knowledge acquisition and involvement; we label this phenomenon the 'education revolution'.

Smart technologies, from interactive learning tools and virtual reality simulations to online platforms and mobile applications, have transformed the learning experience. These technologies offer personalised educational opportunities, access to vast learning resources, and interactive interfaces that satisfy diverse learning preferences and needs. The integration of smart technologies into education offers many benefits,

and it supports active ageing in the process of learning. Importantly, smart technologies enable flexible learning at the learner's own pace, thus removing the barriers of time and place. Older adults can take part in learning activities at their own convenience without the necessity to adhere to strict schedules or move into the formal educational space of a classroom. What's more, smart technologies offer personalised learning experiences adapted to individual needs and preferences. Smart algorithms and data analysis provide relevant and attractive learning content, which allows older adults to focus on their areas of interest and alter the pace of learning based on their abilities.

Smart technologies have great potential for supporting active ageing in education, but certain obstacles and challenges need to be addressed. One such obstacle is digital and technological literacy; some older adults lack the skills needed to fully utilise smart devices and applications. This also relates to the sustainability of educating older adults, the dissemination of updates in the development of technology, and keeping pace with innovation. The provision of adequate professional training and support for the educators of this target group is an equally important challenge.

Considerations regarding accessibility are also essential to ensure that smart technologies meet the varying needs of ageing individuals. User-friendly interfaces, compatibility with assistive devices, and comprehensive design principles should be adopted in order to develop an inclusive learning environment for all older adult learners. Strategies that promote inclusivity and involvement among older adults include using community education centres, offering mentoring programmes, and promoting intergenerational learning experiences. Cooperation between educational institutions, technology developers and community organisations are essential for stimulating active ageing initiatives and ensuring the longevity and sustainability of such programmes.

Educational institutions play a key role in adopting smart technologies and designing educational programmes that satisfy the needs of older individuals. Policies and curriculum adjustments should be adapted to technological advances and give priority to active ageing initiatives. The provision of ongoing training and support is key for digital and technological literacy and ensuring ongoing engagement; this can be

achieved through dedicated IT support, online tutorials and peer learning programmes. Cooperation and partnerships between educational institutions, government agencies and technology companies are essential for supporting active ageing initiatives. This university textbook itself is an example of one of the outputs of such a partnership. By combining resources and expertise, stakeholders can develop innovative solutions, share proven practices and create a supportive and sustainable ecosystem that is also innovative and supports older adults during the learning process.

With the advent of new technologies, the future has real potential for the process of active ageing in education. Artificial intelligence, robotics and wearable devices are among the cutting-edge innovations that will further improve the learning experience although ethical considerations, such as privacy and data security concerns, must be carefully addressed to ensure the responsible and beneficial use of these technologies. Active ageing, education and technology should be connected, and by embracing such a connection stakeholders in the field of education can contribute to a society that values lifelong learning and provides equal learning opportunities for people of all age categories. Active ageing and smart technologies form a powerful combination that is revolutionising education, making it more inclusive and more accessible for older adults. Through flexible learning opportunities, personalised content and innovative tools, smart technologies promote active participation, mental stimulation and social interactions among older adults.

1.5.1 Smart Technology in Everyday Life and Care of Older Adults in the Future

Artificial speech agents, known as chatbots, have become more prevalent in recent times. There are many expectations in society linked with the embodiment of such systems of dialogue in the form of social robots - autonomous machines in humanoid packaging with which we communicate through verbal expression. An endless number of artificial dialogue systems and computer programs that simulate human conversations surround us already. Among experts, terms such as *dialogue systems* or *speech agents* refer to computer programs that solve specific tasks (customer service, for example), while the term *chatbots* indicates systems that imitate natural speech in real-world situations. Agencies in many advanced European social welfare

states already have a specific idea of the future and the use of such technologies in those spheres where there is a lack of helping professionals – in social, healthcare or care-provision services. This vision of the future is based on social robots that have or soon will have communication systems that enable interaction with humans. Despite advances in speech technology, however, processing natural language in context remains a significant problem. The goal of social robots in care as a form of digitalisation is not to replace the need for face-to-face dialogue, but to bring changes in the form and character of dialogue.

Digital assistants which have both voice and text interfaces, such as Siri (Apple) and Google Assistant, have become commonplace. In a voice system for smart homes, interaction can operate through commands such as: 'Hey, Google, turn on the light in the living room!' Virtual assistants can also provide information in response to specific questions: 'Siri, where is the nearest pharmacy?' We also encounter specialised (or task-based) dialogue systems in everyday life; most of them are textual, such as those on the websites of municipalities, banks and insurance companies. In cases where a robot processes industry-specific customer requests, the computer program responds by providing standardised information based on the user's keywords.

In the last decade, speech agents have also been embodied through so-called social robots - machines that can interact with people in social situations through speech and other communication modalities. In this way, they differ from industrial robots and robotic vacuum cleaners, which are not designed to communicate using natural language. One example of a humanoid machine is 'Pepper' (Vartdal, 2018); Pepper the robot illustrates how today's social bots embody traits that, at first, pique the interest of the users. Pepper was the first commercially available 'emotional robot', has a humanoid design, and is pre-programmed with a set of micro-gestures that bring the machine to life and give the impression of meaningful interaction (Solberg, 2023). It can orientate itself to stimuli such as sound, movement and touch, and on recognising a human silhouette its eyes light up and it turns its face towards the person, causing the machine to appear as if it is making eye contact. By changing the colour of the eyes from white to blue when listening, or to green when processing information, the robot can to some extent meta-communicate about the state of its communication.

Although the signals are arbitrary and do not make intuitive sense in the first interactions with Pepper, these attributes can create the rich experience of a robot acting independently and intentionally, but in line with other ethnographic studies of human-robot interaction (Hasse, 2022). However, people who communicate with Pepper over time are ultimately disappointed by the response, and eventually they lose interest. This is not primarily because the robot has a poor vocabulary, but because it lacks the pragmatic competence to sustain conversations over time (a skill that humans regularly use effortlessly). With the absence of this competence - including the ability to find meaning in context through multimodal interaction, taking turns when speaking, and timing and correcting conversations in the case of misunderstandings - such exchanges between Pepper and its human handler break down.

Similar 'robotic visions' circulate in post-industrial Japan, as Jennifer Robertson (2018) shows in her ethnography *Robo Sapiens Japonicus*. Care-providing robots have long been part of the national political vision because of the ageing population and new familial structures, even though machines are not yet fully and functionally integrated into the social apparatus. Such visions of the future anticipate machines that have or will have ingenious communication systems for interacting with humans on a large scale, with the associated major social consequences. Some social robots are equipped with physical attributes that support contextual aspects of language use, such as hands for gesturing, eye movements, lights that indicate different states, as well as other types of body language. The repertoire for meaningful interaction in context, however, is very limited compared with the resources that people regularly use among each other (Solberg, 2023).

Several European visions for the future include social robots and artificial speech agents in dementia care services, especially as a source of social contact (Lu et al., 2021). Dementia care is resource-intensive and caters to a rapidly growing group of service recipients, and it is not always taken into consideration whether these people live at home or in a social service facility when allocating smart technologies. The World Health Organisation estimates that there are more than 55 million cases of dementia worldwide, and that cognitive impairment affects some 80% of nursing home residents (WHO, 2019). However, when artificial speech agents are used as dialogue

partners in social services or care-provision services to support social contact, the technology's poor understanding of the context of the spoken communication becomes a significant challenge; errors and misunderstandings could ultimately compromise patient safety and quality.

Sawik et al. (2023) describe two kinds of robots for the life and care of older adults - service robots and social robots. Service robots are robotic devices that can be used to help older adults with their daily routine and improve their overall quality of life. Such robots can do a range of tasks, from helping with general housework to offering companionship and health monitoring. Service robots can be the following:

- Robotic assistants: these are robots that can help with everyday tasks, such as cleaning, cooking and medication reminders. They are equipped with sensors and cameras to help them move through the house and perform their duties.
- Personal robots: these robots are designed to provide companionship to older persons. They can converse, play games and provide entertainment; they are also equipped with sensors that detect falls and monitor vital signs.
- Robotic exoskeletons: these are wearable robotic devices that can help the mobility of older adults. They provide assistance and support when walking and can also be used in rehabilitation (Sawik et al., 2023).

Overall, service robots for the care of older adults are gaining in popularity because they can improve the quality of life of the recipient while reducing the workload of caregivers.

Social robots are robotic devices that can be used to provide emotional support and companionship to older adults. These robots are equipped with sophisticated sensors, cameras and microphones that enable them to perceive and react to human emotions, movements and facial expressions. Social robots can be the following:

- Companion robots: these are robots that are developed to provide older adults with companionship. They can converse, play games and provide amusement. They are also equipped with sensors that detect and respond to human emotions, and they can deliver medication and appointment reminders.

- Pet robots: these are robots that look and behave like pets. They can provide the older adults with comfort and emotional support if the person is unable to keep a live pet due to physical limitations or their living situation.
- Cognitive assistants: these are robots developed to help older adults people suffering from cognitive disorders, such as dementia. They can serve to remind the older adult of their daily duties and obligations, help with exercising the memory, and may also provide cognitive stimulation.
- Telepresence robots: these are robots that have the possibility of video conferencing and can communicate remotely with healthcare workers, family members and friends. They are also suitable for virtual tours and social gatherings (Sawik et al., 2023).

Social robots for the care of older people are gaining in popularity because they are able to provide emotional support, as well as companionship to those who are alone or lonely. They can also help alleviate the burden on care providers, doctors and nurses. Social robots have been highlighted as an innovative supplement to the future offer of social and healthcare services in the field of older adult care, especially for supporting social contact for people with dementia; however, dialogue is still a central component in the production of care services, and the importance of situational context complicates the use of dialogue systems for users who live with dementia or other types of cognitive impairment. It is reasonable to ask whether people with cognitive impairment can learn to adapt their communication to social robots who are less capable users of language than the operator themselves. Issues of patient safety, and perhaps ethical considerations, could render it unlikely that robots will represent an acceptable technological solution to the challenges of the social state in the next decade. It should also be noted that the issues of insufficient social contact, the lack of medical personnel and the slow development of productivity in the care-provision sector are older adult problems which must be addressed as a priority.

In recent years, many technological solutions have focused on in-home assistance for older adults. Advances in communication technology, for example, have simplified the interaction between patients and care providers, data science is used to profile user habits and refine therapies, and virtual assistants offer reminders for support with

adhering to medication. Since the early 1990s, a wide range of projects in the field of robotics have focused on the development of robotic applications for 'ageing in place', expanding the scope of this type of application from general healthcare to in-home interventions. However, according to Bardar et al. (2022), there is still no robotic intervention for older adult care on the market that can support independent ageing at home, even after three decades of activity and many prototypes.

The introduction, implementation and use of service or social robots, as well as various social care technologies in social services, are difficult but possible tasks. The future of technological advancement will also depend on the attitudes and prejudices of users, developers, educators and other helping professions personnel.

2 THE EUROPEAN STRATEGY FOR EDUCATION AND LIFELONG LEARNING

The concept of active ageing has been gradually brought from the area of scientific communities to the area of European public policies. One reason for the growing importance of this issue is the ageing European population; *Towards a European Strategy for Older Persons* (2024) explains that ‘the demographic challenge that European society is facing today needs to be resolved with the help of policies that will bring about a paradigm shift, make older people more visible and, in place of the current concept based on care, promote the strengthening of their position and the dismantling of the stereotypes associated with age’. The demographic challenge (increasing longevity and declining fertility in recent decades) is, together with climate change and the technological revolution related to artificial intelligence, the central question of a new configuration for the future of society. In the interest of handling the current demographic challenge it is necessary to remove any obstacles and use the opportunities associated with an ageing population. Unemployment remains high among older adults, and they face a greater risk of discrimination, isolation and inequality in access to decent incomes, which hinders active ageing (European Economic and Social Committee, 2024).

The concept of active ageing is at present receiving significant attention in key documents of the European Union and the Slovak Republic.

The *European Union* considers the *concept of active ageing* to be the foundation of a positive reaction to the current demographic changes and the necessity of maintaining solidarity between generations. The concept of active ageing aims to enable older adults to be active in the labour market, to support active citizenship, and to maintain good health and independence as they grow older, thanks to a lifelong attitude to healthy ageing.

To identify the initial starting points of the concept of active ageing within the scope of international sociopolitical initiatives, we draw attention the following documents:

- Charter of Fundamental Rights of the EU (Official Journal of the European Union, 2012).

- European Convention on the Protection of Human Rights and Fundamental Freedoms (European Court of Human Rights, 2010).
- Europe 2020 (European Commission, 2010).

These documents emphasise the concept of active ageing in the form of the rights of older people, particularly through the requirements of non-discrimination and the prohibition of any form of discrimination; they recognise the right of older persons to lead a dignified and independent life, to take part in social and cultural life, and to have their freedom and security respected. The European model is also transposed into the national legislation of its signatories, and, in the case of the Slovak Republic, the concept that covers this area (European Commission, 2010) is reflected in a document approved by the Government of the Slovak Republic in 2013, initially called *National Programme for Active Ageing for 2014–2020* (Jašková & Kmetóny Gazdová, 2018).

The updated document, the *National Programme for Active Ageing for 2021–2030*, deals with all areas of a person's life in the process of ageing, and its vision is to support the building of a sustainable society in which current and future generations have optimal living conditions. The programme sets out to achieve this by supporting and enriching the potential of all individuals, and so a specific target group is not defined by age or living situation; rather, the document focuses on all persons actively preparing for ageing, including older people who, due to their age, could be disadvantaged when accessing public services or other forms of support (Ministry of Labour, Social Affairs and Family of the Slovak Republic, 2023). The exceptional importance of the issue of active ageing is evidenced, for example, by the fact that the European Commission presented a Green Paper on Ageing on the 27th of January 2021. One of the biggest shortcomings of the Commission's Green Paper, however, is their approach which sees older people as a cost or expense to society; the social and economic benefits of their more active inclusion are neglected, as well as the emotional dimension of ageing (European Economic and Social Committee, 2024).

The concept of active ageing is at present being transferred from the area of social policies to the area of education, at both the national and international levels. The concept of lifelong education and learning, connected with active ageing, examines the

processes of education and learning that can be applied to learners of all age groups, including older adults; it also focuses on their returning to organised education. There are programmes founded on the framework of lifelong learning that focus on the different needs of learners. Such programmes are included in broader schemes, such as goal four within the 17 goals of sustainable development defined by the United Nations (The Ministry of Environment of the Slovak Republic; Agenda 2030), as well as the existence of the UNESCO Institute for Lifelong Learning, which sees to the needs of disadvantaged and marginalised learners. In this context, lifelong learning is understood to be key to overcoming global challenges and achieving the goals of sustainable global development.

Lifelong education and learning are requirements in today's knowledge-based society, given the dynamic processes of social change. Even though this issue is not new, it only began garnering more systematic attention in the second half of the 20th century, something that is reflected in various conceptual and legislative documents; in the Slovak Republic, this includes documents such as the *European Commission's Memorandum on Lifelong Education* (2000) and the *Concept of Lifelong Education in the Slovak Republic* (2004). Other strategic documents touch on the questions of lifelong learning and education for older adults at the national level, such as the *Strategy for the Development of Human Resources in the Education, Training and Sports Sector Until 2030* and the *Strategy for Lifelong Learning and Counselling for 2021-2030*.

The *Strategy for the Development of Human Resources in the Education, Training and Sports Sector Until 2030* responds to the fact that the dominant trend of current development is the fourth industrial revolution; this is perceived primarily as a revolution in the field of digitalisation and automation, but it also relates to other areas of human life. The skill sets needed for both traditional and new occupations are changing; the ways we work with information – how we create, process and disseminate it – are also changing, as are the ways we communicate, get to know each other and solve problems. There is a growing need to become familiar with the flow of information and to be able to analyse and critically reflect on the information obtained.

The technological and social aspects of this industrial revolution require the development of competencies needed for success, both in one's personal life and professional career. Changes affecting the circumstances and surroundings we live in are equally important. The *Strategy for the Development of Human Resources in the Education, Training and Sports Sector Until 2030* presents the main analytical starting points, names the anticipated development tendencies, and identifies the changes that will affect the sector in the coming times. It predicts the development trends that will influence the provision of qualified human resources in line with the expected development of the labour market and innovations, and lists measures and activities for each level and area of education, training and sport. To process this strategy, the education, training and sports sector was divided into several areas according to the level or type of education, each with their own specificities. Aside from technological changes, the structure of the population will likely have the most significant impact on this sector. With an ageing population, the need for an effective system of lifelong learning comes to the fore, making it essential that more attention is paid to the education of older adults. The strategy includes a total of 83 sectoral measures and 418 activities for achieving the set goals (Mažgútová, 2022; Bulletin, 2022).

The *National Strategy for Lifelong Education and Counselling for 2021– 2030* (NSLLEC) contains the key measures in four thematic areas:

- The first is the field of qualifications, which focuses on second-chance education; increasing the attractiveness and quality of vocational education and training is then addressed. The further development of the Slovak qualifications framework is connected to how the results of informal education and informal learning are recognised legally. Increasing the flexibility of the qualification system is planned to be attained through so-called micro-qualifications (micro-certificates), and therefore support for the introduction of short study programmes at universities or secondary vocational schools is also being prepared.
- The second thematic area, entitled 'Basic Skills and Civic Education', focuses on the creation of a National Initiative for the Improvement of Basic Skills, along

with the creation of pilot intervention programmes, in addition to the support of adult civic education.

- The third and fourth parts of the *Strategy* address the supra-departmental character of lifelong learning and counselling and the motivation for lifelong learning. Harmonising the system of lifelong counselling will form an integral part of the activities, and strengthening the motivations for the participation of individuals in lifelong learning would be made possible through the introduction of an Individual Education Account scheme.

The primary goal of this national strategy is to ensure that every citizen has lifelong access and opportunities to learn and develop their skills and competencies at every stage of life; ultimately, whatever their individual needs and circumstances, everyone can realise their potential in their personal, working and civic life.

2.1 Lifelong Learning and Education as Key Components of Active Ageing

Lifelong learning can be understood as the provision or use of formal and informal education and informal learning throughout a person's life, supporting the continuous development and improvement of knowledge and skills needed for employment, as well as for personal satisfaction.

The idea of lifelong learning (LLL) as a necessity emerged in the second half of the 20th century as the scientific and technological revolution gathered pace, and the year 1970, declared the *International Year of Education*, is seen by many as being symbolic in its history. In the 1980s, LLL began to be reduced to professional education aimed at acquiring specific knowledge important for growth in one's profession, but this view altered in the 1990s. The impact of new technologies was reflected in the sharp change in the economies of developed countries, particularly in their transition from a production orientation to a service orientation. Much greater emphasis began being put on ideas, methods and processes rather than on machines, factories and natural resources, which was reflected in the change of the mission of LLL. The talk began to be about a *society founded on knowledge, a society that learns*, and thus *lifelong learning*. The shift in the understanding of *lifelong education* to *lifelong learning* was

caused mainly by the huge onset of new information and communication technologies and their penetration into all areas of social life. New technologies have changed the existing approaches in nearly all professions, and many activities are performed differently now than in the recent past. The education obtained in school is no longer a guarantee for success in the labour market or throughout one's career, and lifetime permanent employment is becoming less common, resulting in new demands for lifelong learning. Therefore, the main characteristic of LLL is its focus on the individual as the driving force behind all changes and processes in the economic, social, cultural, and political spheres of society. This includes the individual's inner motivation and desire to learn (Boeren et al., 2023).

An important milestone in this regard was the adoption of the *Memorandum on Lifelong Learning*, which the European Commission published on the 30th of October 2000 and submitted for pan-European public discussion in 2001. The memorandum was prepared with the aim of creating a comprehensive strategy for lifelong learning in Europe and is based on the idea of the essential need for lifelong education, the aim of which is to support active citizenship and employment (The Ministry of Education, Research, Development and Youth of the Slovak Republic, 2000).

The Lifelong Education Concept of the Slovak Republic is subsequently based on the European Commission's *Memorandum of Lifelong Education* and the individual aims of the concept are in line with the basic principles of sustainable development in the field of lifelong learning. The Government of the Slovak Republic adopted the concept of lifelong education by Resolution No. 157/2004 of the 25th of February 2004. The legislative area of LLL is further defined on the national level by the law 568/2009 Coll. of the 1st of December 2009, and amendments to certain other acts (The Ministry of Education, Research, Development and Youth of the Slovak Republic, 2000).

Working from the *Concept of Lifelong Education in the Slovak Republic*, we define lifelong learning as 'all learning activities during life performed to improve knowledge, skills and competencies within personal, civic, social and/or employment perspectives' (Hužovičová & Jakúbek, 2014). In this conception, it is often stated that lifelong learning can be understood as cradle-to-grave education.

A component of the education policy is also the prevention of social exclusion of certain groups (immigrants, citizens with an incomplete basic education, higher age groups and so on), and therefore great emphasis is placed on observing the fundamental rights of all citizens, regardless of age, place of residence, mother tongue and financial possibilities. Equal education opportunities for all and respect for the difficulties brought about by increasing age are reflected in educational programmes for acquiring adult literacy and basic skills and in so-called 'second chance' educational programmes (Hužovičová & Jakúbek, 2014). Freedom and equality of chances for all people to access education, despite increasing their age, is important in this concept. Age is not an obstacle nor a barrier to achieving different levels and types of education; on the contrary, education at any age is a benefit that increases the quality of life of an individual and his or her application in the life of society.

Preparation for active ageing should begin from the earliest levels of the institutionalised educational system. A feature of pedagogical literature of educational activity is its long-term perspective, which it describes as one of the basic characteristics of education (Kročková et al., 2004). Practically, this means that the results, changes and qualities that occur in an individual as a result of educational action are not immediately observable; therefore, we must take into account that some defined educational goals will be achieved and manifest after a longer period of time and in various life situations. For that reason, educators should direct the orientation of the learner's personality to what it can be in the future; this requires an approach from every educator/teacher to provide the learner with satisfying educational tasks whose fulfilment will achieve goals that are conditioned by the ideals and needs of society.

The needs and skills of learners change as they get older, which should be reflected in the didactic context of education (goals, content, forms, principles, means, methods). Human society is characterised by ceaseless changes that have an impact on all generations and all age groups; older adults, however, are the worst at coping with these changes. The more time that has passed since a person completed their formal education, the more likely it is that their qualifications and competencies will be

outdated, so updating and developing skills is important to prevent skills from becoming obsolete and to maintain employability and active participation socially.

The philosopher and pedagogue Johann Amos Comenius determined partial goals of upbringing and education for individual periods of life, and they included the period of 'manhood' and old age. In manhood, an adult should further his education and be his own teacher and use the acquired knowledge in all his life activities. Comenius stated that old people should properly use and exploit the results of their work in the last period of their life, and that the goal of growing old is the culmination of life as a prelude to the afterlife. Comenius strove for a pedagogical system based on philosophy and was one of the first authors to develop the idea of lifelong education and training (Gutek, 2022).

Education in general is offered by various institutions and facilities in the scope of formal education and the official school system; this ranges from preschools, through primary and secondary education, to higher education. Adult education, however, involves the action of other key agencies active in the market, who promote the concept of lifelong learning and support access and participation in informal education for all. Among these agencies in the field of adult education in Slovakia are the following:

- Association of Adult Education Institutions in the Slovak Republic (AIVD SR).
- Association of Universities of the Third Age (ASUTV).
- Association of Lecturers and Career Counsellors (ALKP).
- Federation of Employers' Associations of the Slovak Republic (AZZZ SR).
- National Erasmus+ Agency.
- Platform for Non-Governmental Development Organisations (NGOs).
- Republican Union of Employers (RUZ).
- Slovak Academic Association for Lifelong Learning (SAACV).
- Slovak Academic Association for International Cooperation (SAAIC).
- State Institute of Vocational Education (ŠIOV).
- Association for Career Counselling and Career Development (ZPKPRK) (Selecký, 2019).

At the international level, the Electronic Platform for Adult Learning in Europe is a community of experts who are dedicated to adult education.

2.2 Lifelong Learning of Older Adults

It is estimated that during the period 2019 to 2050 the EU population aged over 65 will increase from 90.5 million people to 129.8 million. During this period, the number of people aged 75 to 84 in the EU will grow by around 56.1%, and the number of people aged 65 to 74 by 16.6%. In contrast, according to estimates, there will be 13.5% fewer people under the age of 55 in the EU. According to the 2019 Eurobarometer report on discrimination in the EU, age discrimination and gender discrimination are the most common forms.

Incidences of disability increase with age, and 48.5% of people with disabilities are aged 65 and over (European Economic and Social Committee, 2024).

One of the main tasks of lifelong learning is to help learners navigate in a rapidly changing world, and the education of older adults of any kind can prevent their social isolation, which is associated with alienation.

Hossová (2023) states that older adults can be understood as citizens in the post-productive age (they no longer have to be gainfully employed), set aside by a legal norm. This also includes those who are economically active, as well as non-working citizens of retirement age with specific needs, common social experiences and shared historical circumstances. The day an individual retires is an important landmark in his or her personal and social life; there is a change in their living conditions and opportunities, and for some even the loss of social certainty. The possibility of the new retirees influencing their living conditions is minimal, consequently they could be considered as an at-risk social group. Older adults are generally assigned to marginal groups in a society with a differentiated economic and social structure, and in such a case education can help them in their search for new social certainties, new attitudes towards life and the search for the meaning of life.

After passing the threshold of the retirement age, and especially after their actual retirement, older adults encounter problems due to not being sufficiently prepared for what comes next. Preparation for active ageing should be a part of every level of the educational system, starting with the school system. We identify with the view that the most intensive preparation for old age should begin sometime between the 45th to 50th year of a person's life (Simonetti, 2023). The lifelong learning of older adults is also supported by the European Memorandum of Lifelong Learning, as a continuous process of stimulating and encouraging individuals to acquire the knowledge, values and skills necessary for their future life so that they can apply them reliably, creatively and with pleasure in all tasks, situations and conditions.

Gerontological literature describes the gradual morphological and functional changes of the organism and psyche and emphasises the psychological qualities of the individual's personality as they get older, i.e., the preservation of crystalline intelligence, acquired life wisdom, experience, psychological balance, and the possibility of optimisation and compensation of cognitive functions (Gupta et al., 2024). The basic premise of lifelong learning and education is that *a person can learn at all stages of life, including old age*. This statement is considered to be the starting point of educational activities for older adults.

The specifics of education during old age lie in the fact that there is no longer pressure to obtain or to increase qualifications. Education during this period is voluntary and the participant freely chooses the focus of the education based on his or her interests. Baraldi & Domaneschi (2024) observe that educating older adults involves 'respecting the personalities of older adults and their possibilities (and limits), helping older adults adapt to old age, supporting positive thinking and strengthening the self-confidence of older adults, taking into consideration the age, psychological, physical or individual differences of older adults, communicating effectively (and enabling discussion), choosing education topics carefully, including the use of work and life experiences in the education as much as possible, and guiding education participants to self-education'.

Education in older age should not be an exception but rather the norm, resulting from general (social) and personal needs. The education of older adults in the context of

lifelong learning can be understood as the possibility to optimise adaptation to their changed living conditions and remove their marginalisation in society. An ageing population has resulted in older adults becoming a large social group, and the need to expand the offer of education to them has emerged, along with the need to expand health and social services.

Education for older adults in the Slovak Republic is provided locally by pensioners' clubs and various senior centres; however, the best-known educational institutions for this purpose are the universities of the third age. Universities of the third age (U3V) make it easier for older adults to adapt to the new situations that they typically find themselves in upon retirement. This type of study programme creates the prerequisites for meeting people of the same generation; it is a component of lifelong learning and has the character of personal development, not preparation for a profession. Participants do not receive an academic degree upon completing their studies, thus emphasising that formal education is not the goal but a means to actively fill their free time. Other institutions, such as libraries, cultural and educational centres and others, also take part in the education of older adults, along with health or social care institutions. Additionally, a variety of social organisations and civic associations participate in the education of older adults, such as the Union of Pensioners in Slovakia; among its main tasks are assisting in the implementation of lifelong education and support for the cultural and social activities of older adults.

The content of the programmes varies according to the individual requirements and knowledge of those interested, but the more commonly seen courses include language courses, courses on the development of digital skills, courses on personality development, and professional courses (healthcare, economics and management, gastronomy, business terminology, law and others).

2.2.1 Barriers, Motivation and Interests in the Education of Older Adults

Older adults have a generally positive attitude towards their further education opportunities, although this is tempered by an awareness of the challenges involved. The words *opportunities* and *barriers/challenges* are often mentioned in association with the education of older adults, and so this chapter looks at older adults' participation in

educational activities in the Slovak Republic, the use of ICT in such situations, as well as the identification of barriers to learning.

The education of older adults is gradually gaining intensity and importance in the Slovak educational system, although the challenges its implementation raises require practical as well as theoretical solutions. Older adults view the greatest *opportunities* for education as the quality use of their free time, positive social classification, contact with other people, permanent acquisition of new knowledge, and forming interpersonal relationships with their peers. The *opportunities* that the education of older adults provides is confirmed by research from 2015, in which older adults stated the reasons for their studies at U3V as follows:

- 60.60% of participants indicated an interest in obtaining new information.
- 48.60% mentioned meeting people and improving social contact.
- 48.60% wanted improvement in their quality of life in retirement.
- 45.90% of respondents said they wished to increase their general activity.
- 18.30% wanted to overcome isolation or loneliness.
- 3.67% of respondents mentioned other motives (Hrapková et al., 2015, according to Blusková, 2019).

Fees for studying at universities of the third age at Slovak universities vary; programmes are often financed from various grant schemes, or when education is provided by other institutions the costs are sometimes covered or supported by municipalities or higher territorial units.

Barriers associated with ageing primarily include the health issues of older adults, which significantly impact the take-up of further education. Motivation is another key factor that significantly contributes to the decision to study. Lack of, or absence of, motivation for any activity can lead to a passive way of life for older adults, despite the opportunities available to them. Motivation is also linked with the activities and subjects available, however; those on offer may not correspond to the interests of potential learners. The practical limitations of learners when travelling from their place of residence to the premises of the educational institution, such as adapting to the

timetables of the bus routes or the difficulties in using personal transport, is also mentioned as a major problem, particularly for residents of rural areas.

The needs and expectations of older adults in the context of education are confirmed by the findings of Verešová et al. (2014, p. 115-116), who found that the respondents at U3V *'divide their activities approximately evenly between caring for others, receptive activities, their creative activities and activities in nature. They would like to acquire new knowledge and skills (31%); self-reflection and learning new methods were also mentioned (11%). Most of them expected experiential learning and lectures as a way of achieving their goals. Problems that prevent the U3A students from learning are usually characterised by a lack of time or lack of material resources. Attendees of U3V are most interested in relationships with people and new scientific knowledge. The nature of the subject along with crafts were also of interest to them. The preferred part of the day in which they learn best is not given - half prefer morning classes and half the afternoon. The preferred sensory modalities through which they receive new information are visual and auditory. From lecturers, they expect professionalism but also human sharing, innovation and flexibility'*.

Similarly, more recent research (Zanovitová et al., 2022) confirms that older respondents consider the acquiring and deepening of new knowledge and new experiences to be the greatest benefit of their education; they also comment on situational and institutional obstacles, the accessibility of the educational institutions and the distance to public transport.

In a study by Host'ovecký & Začková (2011), older adults confirmed that *the most frequent opportunities concerning studying within UTV are valuable use of free time (32% of respondents), permanent acquisition of new knowledge (28%) and gaining interpersonal relationships with colleagues (17%)*. They consider *financial resources (38%)* to be the biggest barrier to education, followed by *health problems (23%)*. Conversely, the smallest barrier is *insufficient motivation (8%)*. The reasons that *influenced the decision to study at an elderly age* were, for the majority, *the need to acquire new knowledge (76%)*; some respondents (33%) noted that they were influenced by friends. When determining the educational needs and obstacles in

education for older adults who are institutionalised – placed in a Social Services Home (SSH) – the biggest barrier by a margin is their *state of health* (44%), often closely connected to the second-placed obstacle – the *distance to the educational facility* (20%). These barriers are understandable considering that in this type of facility many older adults already have significantly limited health compared to other older adults attending a U3V. In principle, however, the motivating factors for education are similar in both groups of older adults, namely: *broadening knowledge and skills* (40%), *contact with other people* (30%), *self-development* (17%) and *filling their free time* (10%). Aside from organised learning, we found that the largest percentage of respondents spend their free time reading, which can be classified as a self-educational activity. It seems that a large number of institutionalised older adults prefer doing activities that are not formally organised (such as pursuing a hobby), due to reasons such as a significantly deteriorated state of health, disturbed interpersonal relationships, or a limited offer of activities in the facility. Findings of the preferred educational activities showed that the respondents stated that their preferred educational activities are (in order of preference): *manual work*, *spirituality* (development of the spiritual area), *health or a healthy lifestyle*, *working with a computer*, *artistic activities* (playing a musical instrument, dancing, singing and similar) and *sport and sports activities* (Začková & Hošťovecký, 2011).

Barriers to the education of older adults in general may vary in different areas. These include the physical accessibility of education (accessibility of buildings, travel accessibility, spatial accessibility), awareness of opportunities (comprehensibility of information, digitalisation and the digital literacy of older adults), the approach of society regarding the education of older adults, individual psychological barriers (subjective attitudes, lack of energy, vitality, low self-esteem and concerns such as: 'Will I be able to do it?' and, 'This no longer for me'), the financial availability of education, sensory stimuli and didactic aspects (intensity of lighting in the classroom, the volume and clarity of the information presented, an adequately-sized font to assist reading, the contrast and graphics used on the materials, the appropriateness and meaningfulness of content, the quality of the lecturer, the time of the programme or course, technical security) and others.

It is necessary to remove existing barriers in education at all levels, to allow true access and opportunities for all. Practical measure can be taken to enable this to happen, such as the following:

- Ensuring the accessibility of the educational environment and buildings: using and adapting available buildings; ensuring free movement; removing physical barriers and preventing the creation of new ones.
- Providing accessible transport: removing physical barriers in or around the form of transport; efficient timetables and informational resources.
- Mediating the accessibility of information: awareness of the importance of education; digitalisation; ensuring comprehensibility of information.
- Improving spatial organisation: places for rest; supports (such as for walking); anti-slip floors and stabilising elements; removing sills from under doors or alerting people to their presence; ensuring the safety of stairs; furniture suitable for older adults.
- Sensory stimuli: increase the intensity of the lighting; increase the volume of any spoken or recorded element; use the appropriate size, contrast and the appropriate graphics for any didactic materials.
- It is also necessary to pay attention to other didactic aspects of education, such as the appropriateness and usefulness of the content and quality of the lecturer.

In conclusion, we can state that older adults are a social group whose main features are both *homogenisation* - they share the commonality of being excluded from the working environment - and *differentiation* - in that they are each distinguished by their achieved level of education, profession, financial means and lifelong experiences. Specific approaches to their education and the application of diverse educational offers adapted to their educational needs are therefore essential. Even though there is already legislation in place in the Slovak Republic to support the educational care of older citizens, and new facilities are being established and expanded and conceptual documents are being drawn up and enacted, it is necessary to critically summarise that the reality and practice of education for older adults remains challenging.

2.3 Education and Age Management

A suitable social and economic environment may significantly extend the active life of a person. Most older adults, however, do not know what to do with their free time after finishing their productive working life and retiring, and the younger generation often does not want to know about problems that arise as a person ages. Preparation for ageing is connected with the area of so-called age management; the central element of this is the concept of *working ability*, which is defined by the balance between a worker's resources (health and functional capacity, education, knowledge, skills, values, attitudes and motivation) and the work demands placed on him or her (the content of the work, its difficulty and organisation, the working environment, the collective, and the method of management). Before 1989, certain professions had a fixed retirement age which was called a '*výsluha*' (meaning 'service'). This 'service' retirement reflected the potential physical and mental condition of the given individual; for example, dancers retired at 35, soldiers and police officers at 55.

Adopting measures to maintain and support work skills pays off at any stage of a person's working life. Factors contributing to the weakening of work capacity start to become visible around the age of 45, therefore support should not only be focused on employees of advanced age but should be proactively included throughout a person's entire working life. The first area of importance is the general basic setting of rights, obligations, equal access, and the consideration of all age, social and other population groups entering the labour market. The second area is mainly legislation – the Labour Code, the Employment Act, creating and ensuring satisfactory and safe conditions for the performance of work, fair pay, equal treatment and protection against any discrimination. The third area of importance is the protection of worker's health and safety at work. Age management takes into account the course of a person's life stages (Egdell et al., 2020).

It is equally essential that age management strategies take into consideration not only work, but also life outside work, or leisure activities aimed at personal development and maintaining a good mental and physical condition. The inclusion of leisure-time activities by employers (such as informal education and development) in age

management strategies is key from the perspective of both the organisation and the employee. Younger and older employees must be approached in a non-discriminatory manner, and the needs arising from older age should be taken into account (Ministry of Labour, Social Affairs and Family of the Slovak Republic, 2017). This is the concept of active ageing that can be realised on a practical level through the entire system of age management and the provision of a longer and better working life for the individual associated with it. The planning of the management of an employee's future potential must begin as early as possible; if we ensure a suitable environment for parents, they will hand over to us a generation that want to create economic values in this society for as long as possible. The reaction to the needs of an ageing population in the information society is the possibility to provide older people with a chance for a more independent life, and to support their active participation in society through their engagement in interesting and educational activities. Specifically, older adults are a highly vulnerable group, and measures leading to the prevention of their isolation in society must be carried out in close cooperation with several competent state institutions. However, to ensure the quality of life of senior citizens, it is not sufficient to begin with the end of a productive working life (entering old-age pension); preparation for active ageing needs to be implemented early on with a long-term perspective.

It is important to centre on the individual psychological and social needs of older adults to prevent psychosocial ageing; this has been shown to significantly slow down the ageing process. Adequate stimulation is related to providing sufficient meaningful activities to meet older adults' needs, and such activities should endow the older adult with a sense of purpose. They should also satisfy the need for emotional security and safety; every person needs to belong somewhere and be accepted by other members of the community, especially if it is an older adult who is involuntarily placed in a social service facility. The need for self-fulfilment is equally important, being linked to both the need for stimulation and the social position of older people. Older adults must often search for new lifestyles and learn new strategies to adapt to new living conditions; in addition, older adults need to come to terms with the fact that they will no longer be

fulfilling a professional role and will need to find new meaning in life (Sánchez-González et al., 2020).

Human ageing is accompanied by several adaptation issues; each process is individual and depends on the person's personality type. It is possible to outline the basic personality types of older adults as follows: people who are realistic about their age and remain optimistic and active; those who are optimistic and active but do not accept the fact that they are ageing; those who are both realistic and pessimistic; and those who are resigned and pessimistic (Çelikkanat et al., 2024). Everyone comes to terms with old age differently, but what is important is that a person always sees the meaning of his or her life, so that there is something to be devoted to – common examples include gardening, family, caring for grandchildren, the household, or education. Education is not limited by time or age, therefore it should be a priority of our society to facilitate ageing and living through the time of old age with the benefit of continuous education and training. For a modern adult, having only the knowledge acquired in youth is no longer sufficient, and it is necessary to continue developing and learning - it has been proven that the more a person is educated, the more he or she manage difficult life situations more easily and efficiently. This is particularly important in the case of older adults.

Putri et al. (2020) differentiate educational activities from a generation-target orientation into the following three basic categories:

- Pre-elderly education - this involves preparing a person for old age and ageing. A person must expect changes in their personality and organism in old age if they do nothing to prevent or eliminate them. As the author further states, pre-elderly education can be considered in three time-horizons: long-term preparation for older age (which should be implemented throughout life); medium-term preparation for older age (this should be between 40 and 60 years of age); short-term preparation for older age (which should start about five years before reaching retirement age).
- Personalised elderly education – this is the training, education and practice that a person receives at a senior age. It is focused mainly on maintaining, rehabilitating and developing the somatic, psychological, socio-affective,

emotional and spiritual personality of a senior. It aims to teach older adults how to age actively and use their potential, even in old age.

- Pro-elderly education – this is the lifelong formation of a positive relationship with old age, ageing and older people. It is intended for all age categories, and deals with the problems of older adults in a transgenerational context.

The self-education of older adults involves a certain set of activities aimed at developing, forming and self-improving their personality.

2.4 Identification of the Older Learner's Educational Needs

A needs assessment consists of collecting information on the current state of knowledge, abilities and skills of the learners, on the performance of individuals and groups of learners, and comparing the obtained data with the desired level of achievement. The result of such an analysis is the identification of gaps in knowledge, skills and performance which need to be filled, with a focus on what can be solved through education. When identifying educational needs, it is important to tune the needs of the individual with the needs of society. Individual development and educational needs can be identified from the following three different angles: the subject of education (individual needs and wishes); the requirements of the labour market, or the position held in the work environment (assessment, discrepancy between job requirements and real qualifications); and future development (planned professional career growth or application in personal or social life). Useful tools and techniques for assessing educational needs include document analysis as a research method, observation, questionnaires, interviews, tests, and brainstorming.

Professional texts from the field of andragogy, personnel studies and human resource management ambiguously approach the definition of individual needs, which they classify as educational, developmental or learning. Education is only one of the ways to satisfy these needs, albeit the most important. Sometimes, a request is stated in the place of a need, which is its verbal (written) expression when the learner has named it.

The term 'need' in this most general sense means something that arises and should be resolved for the individual's development to occur, continue or progress. The

essence of development processes is individual learning to achieve a certain change. Education in this meaning (as an organised learning process) is a means (instrument) for the further development of a person. Developmental needs are broader than educational needs; they are associated with learning processes in various environments and forms and serve to satisfy a wider spectrum of learning requirements (Pavlov & Valent, 2020). To be able to undertake a targeted and effective intervention, it is important to know the deficit – the need – and understand it, while identifying those tools that will be effective in satisfying it. The process of assessing development needs consists of the following stages (Pavlov & Valent, 2020):

- Diagnosis of needs – recognising and determining the subject of the diagnosis, which can be traits, problems, processes, persons, products, etc. based on certain symptoms.
- Analysis of needs – the analysis, disassociation, breakdown, arrangement, or classification of individual traits of subjects, phenomena, processes, products, etc. to their elements or parts. The result (an analysis report) has a variant character and usually serves as a basis for further decision-making (identification of additional measures and interventions to improve the condition). There are two levels of analysis; on the first, the implementer provides the learner with a justification for the development needs he has identified and gives the arguments as to why he considers them significant. On the second, he or she makes a recommendation for the next course of action regarding the identified development needs (how to satisfy them).
- Identification of needs – examining someone or something by determining fundamental properties (with processes, people, products, etc.) for inclusion in the appropriate group. This is the assigning of a known quantity - an identifier (a recognised development need) - to an unknown entity (organisation, team, individual) so that it becomes known to itself. In this assignment, we aim to identify an optimal and effective tool to meet our development needs. This may include recommendations for education, self-education, training, counselling, mentoring, tutoring, coaching, or other suitable interventions. We will also determine the appropriate timing and scope of the intervention, as well as the

forms of support required, whether internal or external, formal or informal. Finally, we will select a provider, which may be a subcontractor or self-help resource.

- Planning activities - this stage consists of several steps. After recognising the development needs and formulating the expected results in the form of goals, it is necessary to determine the development activities by which we plan to satisfy these needs (Chen et al., 2024). Additionally, the responsibility for development must be established, such as what the individual will do and what support he or she will have from others, along with the schedule - when the development activities are expected to begin and end and when the monitoring and assessment will take place. Different methods of education should be included, not just one or two.

The different methods of education are commonly classified into three groups based on where they are used, as follows:

- Education received at the workplace - coaching, mentoring, job rotation (acquiring experience by fulfilling other roles), work observation, and active learning through collaboration with support teams.
- Educational methods complementing work activities outside the workplace - a trainee/apprentice in the field, following instructions, the question-and-answer method, task assignments, projects, studying recommended literature, using computers, video or interactive media for increasing knowledge and abilities and multimedia education.
- Non-workplace learning methods - lectures, discussions, case studies, role-playing, simulations, group exercises, group dynamics, training groups, interactive skills training, assertiveness training, neuro-linguistic programming, distance learning, learning through play, and others.

When planning educational methods, it is necessary to keep in mind the reality of the planned activities and whether they can be managed according to the schedule. According to Chen et al. (2024), development should not create any special pressure;

it is assumed, however, that it will continuously nurture, stimulate and provoke a person.

2.5 Education Procedural Aspects when Teaching Older Adults

The basis of a successful educational course is thorough planning and designing. The starting point is the establishment of desirable goals based on the rigorous identification of educational needs, which should be closely related to the motivation of learners; other factors include external and internal forces which influence educational opportunities for the given age category. The teacher must consider how to *motivate learners to study, the system of assessing students, feedback and reflection, the interpersonal relationship* between the teacher and the student and the overall *process of education*.

Older adults are not generally motivated to learn for vocational reasons, unlike traditional students; their intent is to improve the level of their current knowledge and skills, including the application of knowledge in practice. They are more confident with professional topics with which they have experience, and they often feel that their study skills are lacking, giving rise to self-underestimation and low self-confidence. It is not uncommon these days for people to begin studying or continue studying in the later periods of life, including old age.

The educability of older adults depends on internal conditions (their cognitive functions, motivation, ability to learn, health condition, current level of knowledge) and on external conditions (access to education, availability of educational forms, and so on). Organising educational programmes for them can be complex because of the need to respect the specifics of this age category, and knowledge of the mental, age-related and individual characteristics of older adults is an important factor. Attention also needs to be paid to the emotional side of older adults; they should decide for themselves whether they will learn with people of their own age or with younger people (intergenerational learning), and they should have the right to choose from the offer of educational events according to their interest.

For these people, experiences from other areas of life - work and professional, partnership and parental - are already interwoven into their new life as a student. This influences their attitude and adaptation towards studying. It is possible for them to increase their qualifications through studying, but most often they are deepening their knowledge in an area of their interests and interest-based activities. They often study and practice their profession at the same time, so it is necessary to perceive them as experienced workers and experts who are more practically orientated and practise more andragogic approaches and procedures. With increasing age there is a gradual change in sensory, memory, intellectual and psychomotor performances, and a teacher in adult education must know such changes and respect them. The adaptation of teaching to adults, however, should not so much concern the content, but more the methods and forms of teaching (Jardim et al., 2024).

In the education of older adults, the work of the educator has certain specificities. Often, he or she works with groups of participants heterogeneous in terms of age and performance. Great attention needs to be paid to getting to know individual participants, respecting diversity and adopting an individual approach. Focusing on the positive qualities of adults, an appropriate level of informal collegiality, and respect for human dignity at every moment of teaching is important. The educator can use the experience of older adults and involve them in the teaching, although this requires good professional and pedagogical competence on the part of the teacher, along with organisational skills (Ahmad et al., 2022). In contemporary education a teacher's role involves managing and leading learners in both the classroom and in online spaces, including distance learning and combined forms of study. He or she should be proficient in working with information and communication technologies, such as electronic forms of communication and teaching methods that utilise these technologies. Older adults studying online spend a lot less time on direct teaching, meaning more space can be devoted to their individual education and guided self-education.

A teacher may encounter some problems with older adults, but these are usually different from those experienced with younger learners. Teachers do not have to solve discipline problems (fights, bullying or aggressiveness), do not have to communicate

with parents, organise class meetings, supervise during breaks and organise lectures on the prevention of socio-pathological phenomena. The activation and motivation of the participants are an even more important condition for the effective education of older adults. External motivation is prevalent in this category of learners to a lesser extent (such as the needs of an employer, obtaining a new qualification, or retraining); it is more about interest-based types of education founded on the voluntary choice of the learners, and their internal motivation and interest become the most important elements. Among the motivating agents is wanting to use or hone the knowledge acquired in life, the attractiveness of the subject matter, the novelty, the pleasant surprise at the quality of the education (perhaps linked with unfavourable experiences from the past or from childhood), curiosity about the modern content, the personal relationship of the educator with older adult participants in the educational activity and the positive emotional atmosphere, the demonstrating of activities, phenomena and objects, problematic questions and situations (raising doubts), collaboration on projects, and praise and various types of rewards. A certain portion of older adults take part in education to meet other people and feel a sense of belonging (Massey et al., 2021).

The motivation of older adults to study tends to be diverse; Zanolitová et al. (2015, p. 22-23) cite the following reasons: *'...the need for education, the effort to settle a deficit in education; studying a subject or area for which they did not have time in the past; assigning theoretical knowledge to previous experiences or already acquired practical skills; following a specific interest (including the issue of ageing); obtaining the social prestige connected with the name of a university; the need for self-reflection, self-realisation, the search for new orientation and tasks; a space for stimulating an all-round interest in life; potential for stimulating activities, and encouraging activity in the sense of following the principles of healthy ageing; expansion of social skills; the need for communication, especially with younger people; the need to share one's empirical potential; an opportunity for making close contacts and new friendships between participants, and overcoming the feeling of loneliness'*.

From a didactic point of view, it is necessary to know the life position of the learners, as this fulfils an important motivational function; knowledge of their social environment and the level and type of any previous education they achieved is also important. A teacher can only influence students, however, if a relationship is established on trust. Teaching adults means it is necessary to apply andragogic principles when communicating with them, taking an approach towards the students based on partnership. One of the important principles for teaching adults is supporting their activity and independence; to do this it is crucial to support positive motivation, and to explain to them that education can bring knowledge, finances, fun, new friends, escape from stereotypes, as well as success in a practical independent life or the labour market. On the other hand, time-consuming teaching and physical fatigue can demotivate a student, along with the inappropriate makeup of the teaching group or the fear of failure. A positive climate in the classroom and good relationships with both the educator and classmates can alleviate this concern.

One of the significant aspects of adult education is the benefit of bringing educational activities as close as possible to practice and practical life. Excursions, internships and specific work with tools and devices of the trade are always welcome, as is the perception of the practical knowledge and experience of participants by the person teaching. These can enrich not only the other participants, but sometimes the educator as well. It is important in this instance that the person teaching has sufficient self-confidence to be able to acknowledge his or her possible unawareness and appreciate the experience of his or her learners. The content of the education must also correspond maximally to the needs, possibilities, knowledge and ideas of the participants; therefore, in this context, an initial diagnosis of the educational needs of the learners and regular checks is essential. The content of education is understood to be the specification of the educational goal in the teaching material. The content should be conceived such that it complements, develops and deepens the current knowledge of the participants, together with systemising it. When defining the required educational content, it is important to specify exactly what the participants are to learn, or how their attitudes and behaviour will be modified by the learning process.

When designing the content of the education, the following steps should be performed:

- Set out clear tasks, based on the educational goals.
- Define the scope and breadth of the issue.
- Assign specific work tasks to individuals or groups.
- Determine the significance level of information as basic, secondary or generalising.
- Create a logical system of mediating information (the way of making it available by choosing forms, methods and means).
- Think through and elaborate tasks for reinforcing and deepening knowledge.
- Determine optimal ways of checking the achieved results of the educational process.

In older adults, the teacher must not underestimate the importance of their continuous positive assessment (which is also true for younger students). While adolescent students are 'blank sheets' to be shaped by the teacher, adult students are personalities full of experience that cannot be ignored. It is the recognition of already acquired experience and knowledge of the learners that is one of the main principles that must be followed.

Physical and sensory changes caused by the age and the health status of older adults must also be respected in the educational process. Visual acuity begins to peak around the age of 20, and then the physiological ageing of the eyes begins and the number of people with visual impairments increases. In Slovakia, approximately 23% of the population has a visual impairment at the age of 20; At the age of 40 it is around 48%, at the age of 50 around 71% and at the age of 70 it is around 95%. Sensory performance increases until a person is just into his 20s, and then sensitivity to stimuli too short or weak begins to decrease. Practical measures, such as speaking more slowly and loudly when teaching older adults, make a significant difference. In education, hearing and seeing complement each other and enhance other senses, so new words, numbers and concepts should be presented both verbally and visually. According to Pepper & Nuttal (2023), the ability to simultaneously monitor a large number of different sensory stimuli decreases with age. The concentration of attention

has favourable conditions up to the age of 45. Intelligence is already developed. Auditory and tactile sensitivity, as well as reaction time, peak between 20 and 25 years of physical age. Mental maturity accelerates.

As well as biological development, memory performance in adulthood is also the result of psychological and social development, i.e., they are related not only to age but also to lifelong activity and the use of memory. The ability to memorise mechanically decreases from approximately 25 to 30 years of age. Young people have a better ability to memorise subject matter mechanically, though adults know how to structure the subject matter better, which requires more time. Adults have a harder time remembering subjects without a logical arrangement, presented rapidly and in an inappropriate environment (noise, music, poor lighting, tense atmosphere). With increasing age, activities performed before learning (proactive attenuation) and after learning (retroactive attenuation) are more distracting for the learner (Niu et al., 2024).

Intellectual performance in adulthood has very little effect on the educational ability of adults. It climbs until about age 20 and remains unchanged in the decade from age 20 to 30 years; after this, a smooth but very weak decline takes place. In older people, there is a more significant decline in those intellectual performances that require the involvement of short-term memory or are performed under time pressure.

According to Zhang et al. (2022), older adults can also be considered as learners with special needs as they often experience associated conditions alongside the natural processes of physiological ageing - for example, they may have sensory, physical or multiple disabilities, chronic illnesses or health conditions, or a combination of any of these. Due to the specific characteristics of this group of learners, it is important to respect the following when educating older adults: acceptance of older adults as equal partners in the education process and education has a social and integrative function; providing motivation, optimal conditions, methodical guidance and support will promote self-education, self-improvement and personal growth; adapting the educational content to the experiences of older adults, creating positive motivation for further learning and problem-solving, and using their life experiences as part of the programme will all enrich the learning and teaching process. Active-based social

learning plays a crucial role in helping older adults adapt to changing socio-economic and cultural conditions, enabling them to adopt new patterns and models of behaviour. Conflicts and contradictions are often linked to an adult's personality, which can motivate them towards self-development and improvement. It is important to encourage older adults to internalise societal expectations and act based on their convictions, rather than simply complying with social norms.

2.5.1 Education Methods for Use with Older Adults

Based on the set goals and the selection of the appropriate content for education, the next step is the selection of adequate teaching methods and forms, which are also associated with the use of appropriate didactic tools in education.

When teaching older adults, similar methods to those used in secondary and higher education are employed. The methods are classified according to the following criteria:

- According to their function in teaching, they are classified as motivation, exposure, fixation, application and diagnostic.
- According to the main source of the participants' cognition, they are divided into verbal, demonstrative and practical.
- According to the level of activity, independence and creativity of the participants in their application, they are divided into informative-reproductive, task-based and problem-based.
- Additionally, adult learning methods are commonly categorised as monological, dialogical, problem-based, and training methods.

Tsang (2021) further supported the use of strategy-based training to enhance prospective memory in healthy older adults. This study underscores the value of problem-based and training methods in addressing the unique educational needs of older adults.

Monological methods of giving information and educating could be giving lectures, descriptions, interpretations or verbal instructions; these are most appropriately used

for topics that are new to the participants. They are also suitable when there are a large number of participants, although in both cases the use of monologic methods is difficult. The positive side of monologic teaching methods includes their long-term tradition, compactness, density, systematicity, and the relatively simple preparation for the lecturer. The pace of these methods is determined by the lecturer (Steinberga, 2023). Their negative aspects include weaker feedback (reduced to visual contact and registration of non-verbal expressions), the learners' gradual loss of attention and little emotional involvement, and the failure to use the life and professional experiences of the participants. Monologic expression can be divided into three parts: introduction – main part (core) – conclusion. It is necessary for the introduction to spark the interest of the participants and familiarise them with the focus and content (outline) of the lecture. In the main part, it is important to divide the curriculum into smaller, logically coherent parts, after which it is appropriate to make a partial summary. In the conclusion, the information should again be summarised and a general recap of the main points and ideas of the presentation given. A lecturer's monologue in adult education should not be very long, and it should be combined with a short interview or discussion. During the discussion, the lecturer gets feedback about the participants' mastery of the subject matter. A lecturer can also present a monologue of a problematic nature and ask rhetorical questions.

Dialogical methods have more place in older adult education than monological methods. The experience of the adults is used, and the teaching is characterised, by greater emotional involvement. The lecturer can choose from a large number of dialogical methods – e.g., a learning discussion (Socratic method), a dialogue based on predetermined theses, a panel discussion, a dialogue based on written questions, a discussion in a circle, a group discussion, a plenary discussion, a chain discussion, and so on. Dialogical methods require more time as well as an experienced lecturer and good preparation. Monological and dialogical methods are usually combined in adult education – e.g., a lecture with plenary discussion, a lecture with group discussion, a lecture with an accompanying report, and a lecture with discussion based on various topics.

Problem methods are characterised by the fact that a simulated pedagogical problem (problem question, task, assignment, situation) is inserted into the interaction between the lecturer and the participants. Well-conceived problems contain strong motivational impulses and enable the development of creative thinking. They run in several stages: orientation on the assignment, analysis of known and unknown elements, formulation of the problem and working hypotheses, a solution in groups or individually, and verification of the solution. Basic problem-based methods of adult education include problem interpretation (the lecturer's explanation serves the participants as a model of creative thinking; the lecturer presents the development of the problem and demonstrates its solution by logical explanation or proof), heuristic methods (often associated with experiments and demonstrations of researched phenomena coupled with the differing opinions of scientists etc.), case studies (participants learn to solve complex problem situations; they obtain case-study assignments in written form, which should be substantive, accurate and with a sufficient amount of information), and staging methods (participants play various social roles and learn to penetrate the thinking, feeling and actions of others) (Filip et al., 2020).

Training methods enable the acquisition and improvement of psychomotor, intellectual and social-communicative skills (abilities) and habits based on acquired knowledge and practice. The essence of training methods is purposeful and multiple repetitions of certain theoretical or practical activities. Multiple repetitions enable learners to acquire a pace and a way of doing things so that they do not have to think about each action. Perfecting and speeding up the rehearsed activity mean a decrease in erroneous actions and a reduction in mental and muscle tension. Training methods are not only used for manual skills and habits; they are utilised for intellectual and social-communicative abilities and habits, for example training the imagination, learning to work with a PC, training for teamwork (Filip et al., 2020). The dominant role of self-education in adults should not be underestimated. Loeng (2020) describes the most frequent methods of self-education as: learning aloud and silently, individual and group learning, learning based on memorisation and understanding, self-discussion, self-encouragement, self-training, the method of positive example, correspondence method, consultation method, mediated method, and the method of repetition and

verification. When designing a course, it is necessary to consider the choice of the most effective form. The same teaching method and the same material and technical means can be used in different organisational forms, though the goal and content of the education are always decisive.

2.5.2 Forms of Education for Older Adults

Forms of training and education for older adults are defined as a summary of organisational measures and arrangement of the didactic variables, teaching space and time. Oleksin et al. (2023) classified them according to:

- The number of participants (individual, group, face-to-face, mixed teaching) and the interaction between the lecturer and the participants (participatory, cooperative, individualised, face-to-face, distance, correspondence, controlled, open).
- The makeup of the participants (forms with a constant composition of participants – e.g., a lecture, course, exercise, seminar, internship, conference, symposium - and forms with an unstable composition of participants – e.g., public lectures and discussion evenings).
- The environment in which the teaching is conducted (lecture halls, classrooms, laboratories, workshops, at the workplace).
- The focus of the pedagogical action (specialisation, innovation, retraining and others).

The different forms of education can be divided into one-time occurrences, cyclical (they return to selected topics after certain time intervals), continuous, or graded (the content of the lectures follows on from those before). According to time restriction, the duration of the programme can be short-term (from one day to one week), medium-term (one week to four months), and long-term (lasting more than four months).

The following terms are usually used to describe the most common forms of teaching in continuing education:

A *lecture* is one of the collective forms of teaching and is mainly based on the monologues of the lecturer (the word *lecture* is also used as a verb to denote the lecturer's monologue method). The recommended structure of the lecture is the following: introductory words and an introduction to the topic; the core of the explanation – evidence, interesting facts, practical examples using a combination of theory and practice (application), debate, discussion, and answers to questions; summary and generalisation (Jensen & Ottesen, 2022).

According to Oleksin et al. (2023), a *course* is a complete organisational unit of adult education, composed mainly of several lectures, exercises, study tasks and exams, aiming to achieve educational and training goals. It is characterised by a fixed educational programme, a formal opening and closing, and the issuing of a certificate.

An *exercise* is an organisational form in which the lectured part of the programme (subject) is applied with the active participation of the participants.

A *seminar* is an organisational form in which the presented part of the programme (subject) is theoretically and methodologically developed and deepened with the active participation of participants. Exercises are typical for teaching natural science and technical subjects, and seminars for teaching social science and humanities subjects.

Aside from traditional methods and forms of adult education, some 'new' or 'modern' forms of education have also emerged in association with the development of ICT and its integration into education. ICT has not only penetrated the education process, however, but also the study materials, the seeking of information, examinations, testing, and the notification of changes in teaching. The COVID era has also been a catalyst for a move away from face-to-face teaching to distance learning using online platforms. In the field of adult education there is a demand to develop the process of *self-education*, whether in guided or unguided form, and here there is a greater possibility of combining new forms to traditional forms of teaching and introducing new technologies. Trends in education are often combined with the utilisation of ICT, such as *open learning* (the student can choose the content, length of time and speed of the study), *distributed learning* (conducted by creating virtual classes of students and

tutors; the education is provided for a certain period or comprehensive study in small time allotments), *flexible learning* (adaptation of educational activities to the changing composition, motivation and demands of students, e.g., one semester at a university in the form of full-time face-to-face learning, another semester in the form of distance learning, and following this self-study or practical activities at work), *distance learning* (various forms of systematically organised distance learning through correspondence, telecommunications media and other means), or *blended learning* (Šeben Začková, 2022). A defining feature of these forms of education is their dynamism, which involves continuously adapting to the current needs and demands of society; another of their aims is to find solutions that can reduce the number of teaching hours for teachers and the associated costs of travel for students.

Additional trends in this area include electronic learning (e-learning), including Mobile Learning with the use of mobile applications, Massive Open Online Courses (MOOCs), Online/Virtual laboratories, the whole concept of virtual universities, e-tutorials and Mentoring, Virtual Learning Environments (VLEs), systems intended for managing teaching (referred to as Learning Management Systems or LMS), Personal Learning Environments (PLEs), technology-supported teaching (including flipped learning, web applications for learning, virtual reality and 3D reality, augmented reality, etc.) and Open Educational Resources, which include Open Access Education, Knowledge Management, digital libraries and repositories, e-Portfolios and User-Generated Content (Šeben Začková, 2022). It needs to be noted that the application of computer technology and modern technologies cannot fully replace classical methods and forms of education, which will always have a place; but they can add to it or offer another way to learn. There are numerous other emerging methodologies that can be implemented depending on the content and goals of specific departments and subjects, how much time they can devote, the possibilities of material and resources, and the number and specialisations of the personnel.

2.6 Communication in the Process of Educating Older Adults

Communication plays a crucial role in the education of older adults, particularly in the context of health and language learning. UNESCO (2021) emphasises the importance

of effective communication in education for older adults, highlighting the use of a conversational approach to establish trust. Similarly, Irie (2021) underscores the role of positive communication in language education for older learners, which can enhance their well-being and sustained engagement. Efthymiou (2022) explores the barriers and facilitators in the communication between professionals and older adults, as well as the use of educational videos to improve communication and understanding among caregivers of the elderly. These studies collectively underscore the need for tailored and effective communication strategies in the education and care of older adults.

Communication is a process in which the participants exchange information; it should be dynamic in nature, requiring the active participation of those involved. Communication determines the results of interaction between people (Michvocíková, 2023), and communication with older adults should emphasise the specificity of that process. Communication with older adults takes place in various social situations, such as within the family, among friends, in public, in further education, etc. and has its own specifics (Határ, 2019).

Several factors can influence the communication process, mainly determined by the individual participants involved in the communication. Knowledge of these factors can help the professional in planning the educational process and in its actual implementation, in relation to the choice of an appropriate method of communication with older adults. Gunišová (2023) lists several factors that influence the ability of older adults to be full-fledged recipients of communicated content, including their current physical and psychological state, upcoming changes in the cognitive domain, the state of their memory, and their ability to express themselves adequately during communication. Older adults need to adapt to the pace of verbal communication, and they need short pauses between communicated information to enable them to 'digest' it. Lepiešová (2016) adds that communication with older adults involves using less complex, complicated and explanatory sentences, although more complex messages could be used if they are in a meaningful context; she also highlights allowing more time for the older adults to respond - with advancing age, potential memory access problems set in. Lepiešová further advocates the modification of the environment (the removal of possible disturbing elements, e.g., communication noise - another person's

phone call, noise, other uninvolved people, and so on) and recommends that verbal communication should be combined with non-verbal means of communication, as well as some other supportive means (especially pictograms, charts and similar materials); in verbal communication, face-to-face communication is preferred so that the older adult can observe the means of expression from the mouth. At all times she endorses the use of an individual approach (an individual assessment of the need and the resulting ability to communicate). In addition, Amir (2023) stresses the importance of needs-focused communication that includes empathy, respect for autonomy and clear, simple language, while Choi (2021) suggests assessing communication breakdowns to increase comprehension satisfaction.

Pedagogical communication is communication during the process of implementing the educational activity. It is carried out for the purpose of transmitting and receiving new knowledge and information. Through it, knowledge is developed and educational influences are realised. It is a specific form of communication, involving the transfer of information in the process of education that affects the learners' social behaviour (Hasajová, Porubčanová and Bilčík, 2020).

In *educational communication*, the professional can be characterised as the person who manages the communication process in education by defining the space for the presentation of new information, the space for engagement, as well as by confirming the recipients' own ideas of the communicated content; in turn, the older adult becomes the primary recipient of the communicated content. The communication between them should be directed towards the older adult being able to master the presented educational content and engage in the discussion based on his or her life experience and views. The facilitator's verbal communication is an important way in which the older adult becomes familiar with the topic and content of the training.

3 REFLECTION IN THE EDUCATION OF OLDER ADULTS

Scase et. al. (2018) suggests that social factors, such as the influence of family and friends, as well as individual factors related to real needs and expectations, may also play an important role in the decision of older adults to engage in service-learning. Suffolk University describes 'service-learning' as: '*a pedagogy integrating academically relevant service activities that address human and community needs into a course. Learners connect knowledge and theory to practice by combining service with reflection in a structured learning environment*' (College of Arts and Sciences and the Sawyer Business School, Suffolk University, 2015). The role of reflection in older adults' learning has been examined in many studies. Chang (2019) and Alam (2022) found that reflection can lead to increased knowledge, empathy, and positive experiences in meeting older adults' needs and expectations. Older adults accept the presented educational content and then transfer it into real life through professionally guided reflection (Tokovská, Müller & Hirtlová, 2014).

3.1 Specifics of Applying Reflection in the Education of Older Adults

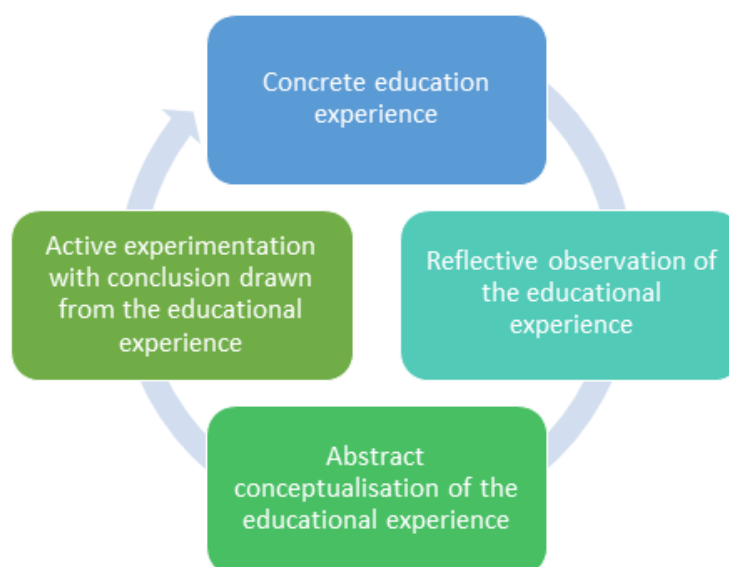
Reflection can have several meanings, according to context. In general, it means looking back and thinking; in science it refers to a process or a change of movement; and in education it appertains to awareness and evaluation at the end of the educational process (Nemcová & Šolcová, 2020).

John Dewey, in his philosophy, indicated the necessity of defining a space for reflection within education, and this was subsequently emphasised by the 'founders' of service-learning, Robert Sigmon and William Ramsey, in 1979. We can also find it referenced in Kolb's cycle (more details later). According to Sigmon (1990), reflection in the educational process of older adults helps them to better understand the acquired experience and, consequently, the facts, information and theories presented to them. The reflection applied during learning is also indicative of its depth; if reflection is lacking in teaching and learning activities, we can only speak of superficial learning. Nevertheless, reflection is often overlooked and underutilised as a component of education. Reflection in education provides the individual with a means to transfer and

connect theoretical knowledge and the content of their education to everyday life. Reflection is thus a process through which an individual actively creates his or her own knowledge and then transforms it into the practice of daily life. Reflective thinking should be an organic part of the learning cycle because it is the base from which new knowledge emerges from the individual's mind. Reflection is a process that helps in the interpretation of an experience and supports cognitive learning. Reflective thinking has a key position in the theory of experiential learning (Nemcová & Šolcová, 2020).

In lifelong learning the close relationship between reality and practice is emphasised, therefore pragmatism and experiential learning are pointed out within the learning theory (this theory was elaborated by John Dewey). A whole order of classifications of experiential learning exists, but in regard to older adults the model according to David Allen Kolb (2015) has proven itself; his book *Experiential Learning: Experience as the Source of Learning and Development* presented the experiential model of education and brought a very significant innovation in lifelong and informal education. This model of education includes a continual process of learning based on the experiences and transactions of the individual with his or her environment (Pešek et al., 2019). Figure 2 presents the scheme of the experiential learning model.

Figure 2. Diagram of the experiential model of learning according to D. A. Kolb (2015).



Source: Brozmanová Gregorová, Bariaková & Heinzová et al., 2014

In Kolb's cyclical scheme of learning, the starting point is the immediate concrete educational experience of the individual; the participant then perceives, experiences, observes and thinks over the educational experience, practical activity or a specific activity; these thought processes are then analysed from different points of view and connected with the intentions of future practice and everyday life. This is thus a retrospective view of the experience, i.e., a reflection. The result of the reflection is the analysis and interpretation of the experience and its placement into a logical framework. Conceptualisation of the experience then occurs on an abstract level, which leads to the creation of new concepts, theories, hypotheses and rules. The end result of reflection is not only the generalisation of experience; it is a springboard that enables adaptation and improvement when similar events are experienced. In Kolb's cycle, active experimentation and the application of acquired knowledge into practice then follow, which brings a new experience using the acquired knowledge and verifies new skills in reality. This phase also includes planning additional steps and/or preparing a new experience, and the new experience is again reflected in the next cycle. The existing four components of the experience model cycle represent four ways of processing information or adapting to the surrounding world.

The lifelong learning of older adults can be understood as a holistically-oriented approach to education and training, emphasising the modern view of education. A holistic approach to learning is based on the overall development of an individual's personality, and not just about accumulated knowledge. Holism (from the Greek *holos* = whole) is a 20th century school of thought that emphasises the priority of the whole over the part. A holistic approach in education recognises that a person has four dimensions (physical, mental, social and spiritual) which must be fully accepted and supported in the learning process (Posse & Melgosa, 2003). Posse & Melgosa (2003) set out the following important features of this approach as follows:

- Personality is characterised by unity and integration, which enables the individual to better cope with life's challenges and develop at different levels of his or her life.

- A person's personality can be analysed by separating its individual parts, but none of them can be studied in isolation; it functions as a whole, according to laws and in mutual contexts.
- A person's personality has the most important drive - self-actualisation, i.e., that a person is still trying to develop his or her basic potential.

In the process of lifelong learning, it is necessary to perceive each person as a learner with a hierarchically organised system (bio-psycho-social system). Lifelong learning must also reflect the needs of subjectivity (personality) and the specificity of the learner's natural and sociocultural environment. These areas have an impact on the spiritual dimension, and this affects an individual's entire being. The general goal of the lifelong learning for older adults is defined by a holistic approach; it is about developing a balanced and harmonious personality which is prepared to respond morally to all social demands put upon it. The aim of a holistic education is also, through reflection, to become aware of the benefits given to all systems of an individual's personality. The results of lifelong education are not only accumulated knowledge and skills, but also the development of attitudes, the acquisition of experience enabling a person to grow further, and the development of personality. According to Fudaly & Lenč (2008), these indicators can be difficult to measure and assess and can only be achieved through continuous, and then final, reflection of the acquired educational experience (Brozmanová Gregorová et al., 2014).

The younger generation use further education to prepare for a profession, while the motivation for the middle generation may be an increase or change in qualifications within the scope of professional advancement; for economically inactive older adults, however, the incentive to further educate themselves is to foster learning for their own interest and development. New knowledge, skills, habits, attitudes, development, changes and personality formation are not the only advantages of education in senior age; using the benefits from completed educational and training activities can enable a person to transform himself or herself and take part in the transformations of his or her immediate and wider surroundings. Regular targeted cognitive stimulation, developing communication skills, actively experiencing a new social role in a community of people of the same age and interests, building new contacts, personal

and emotional ties, greater certainty and speed in decision-making, better understanding of ongoing global changes, gaining a broader overview and outlook of social events, greater self-confidence, a sense of an active role in the community, and personal integrity and self-actualisation - all of these and many other benefits can be brought to older adults by participation in educational activities (Tokovská, Müller & Hirtlová, 2014).

First and foremost, it should be appreciated that the processes of learning as an older adult and teaching older adults are strongly individualised. From the motivation to study, through specific educational needs, aims, forms and methods, to the content of the programme and the method of assessment, a special approach is required on the part of the providers and the recipients of educational activities. The specifics of education for older adults are defined in the second chapter, but it should be noted that it is necessary to respect the personality of each individual and his or her possibilities (and limits), take into account their age, psychological, physical or individual differences, and many other specifics; last but not least, it is also important to include as much reflection of their work and life experiences as possible, and to guide the participants to self-education (Tabor, 2014). If older adult learners acquire reflexive competence, they are able to capture and understand the thought process and their own emotional states. Reflective competence, which develops through reflection on education, is a social competence characterised as the ability to understand the origin and development of certain social situations in their integrative context. Acquiring social competence is impossible without experiential reflection (Nemcová & Šolcová et al., 2020).

Reflection – thinking through, reviewing, debriefing, processing, appraising – expresses the processing of data taking into consideration what has already happened. Reflection means thinking, pondering or considering. From a philosophical point of view, this is a consideration aimed at understanding one's own theoretical and practical outputs. This term was originally used primarily by philosophers; later, it became the basis of Wilhelm Wundt's introspective psychology, which placed emphasis on the observation of one's own mental processes through introspection – that is, deliberate self-observation and awareness of one's mental processes.

Reflection is a process whereby individuals summarise experience acquired from different points of view and think critically about what happened and how. It serves for looking back, for seeking connections between the result of an activity and the actions of an individual (or an entire social group). Reflection also enables looking ahead, because it shows how acquired experience can be used for future activities. This is a process that serves as a retrospective view of the gains and losses from previous experiences and achievements, while at the same time linking them to future activities and broader social contexts (Brozmanová Gregorová et al., 2014). Based on this, we conclude that reflection is about looking back in order to seek a connection between the result of the action and the activities of individuals and the whole group. Creating a new level of knowledge can be attained as follows: firstly, we compare our experiences with those of other members of the group and we specify their significance; following this, we look ahead to see how the acquired experience can be used in subsequent situations; finally, we ask ourselves how to transfer our reflections to ordinary life, after which we will be able to approach other activities with the benefit of our experiences (Nemcová & Šolcová, 2020).

In the process of lifelong learning, reflection is a tool that serves to extract the educational potential from the method or activity used during the education, as well as from education as a whole. It is not just about running through a few questions; we can also use non-verbal methods with individuals or groups. The group responds and names events, processes and knowledge obtained, in the sense of 'what they have learned and what they will do next'. Reflection is concerned with the development of both individual and group learning. It helps an individual obtain a more accurate self-image of their functioning in the world, helps a person start on the path to his or her own positive change - moral, personal, psychological and emotional - and is related to the development of the individual's cognitive abilities. Reflection is a tool that stimulates not only personal development, but also the development of professional competencies and many other major changes. It is the key component that transforms experience into learning, helping learners connect information from theoretical preparation or studied texts with the experiences they gain. Thus, reflection leads to both the learner's own development and a better understanding of the content of

education. Reflection offers the opportunity to become aware of what they have experienced and to think critically about their values, opinions and beliefs. At the same time, it offers space for asking questions and for the mutual exchange of ideas, experiences and skills in solving problems. Reflection thus completes Kolb's learning cycle (Nemcová, Šolcová et al., 2020).

In addition to understanding the meaning and character of reflection, it is important to appreciate the following essential and important elements of reflection:

- *Active listening.* It is important to: maintain eye contact, show interest non-verbally (nodding, tilting the body, open gestures), paraphrase, summarise (to confirm that the learner has understood), and encourage active participation (by asking supplementary questions).
- *Ask questions.* The ability to pose questions effectively is a valuable skill that can be cultivated through training. It is important to recognise that questions are a fundamental means of acquiring information, and that they draw attention to the subject matter at hand.
- *Feedback.* Feedback allows the participants of the reflection to determine if their thoughts and ideas have been received and implemented in the right way. We classify it under the competences aimed at leadership and support in the educational process, because it is very often used precisely in the context of reflection and in guiding participants in education based on their needs (Skyba, Šoltésová, 2014; Nemcová, Šolcová et al., 2020)

Active listening is not easy. Kanitz (2005) states that listening means concentrating on the person speaking and what that person would like to express. When the listener actively listens, this shows the speaker that he or she is valued and that what listener hears is important in a personal context. Active listening thus becomes a very good entry bridge in the process of reflection for creating a relationship of trust, interest and support.

Nemcová & Šolcová et al. (2020) recommend the following seven principles that help a participant's listening to be active.

1) *Listening with the whole body.* This is an attitude in which the visible parts of the body are actively participating (turning the head, sitting or standing posture, and so on).

2) *Listening with the eyes.* Listening with the eyes means looking at the speaker's face, acting naturally and avoiding being distracted.

3) *Listening with the head.* This involves moving the head to indicate that you agree or understand what you are hearing.

4) *Listening with hands.* Gestures with the hands can express either agreement or disagreement. Common examples include: pointing the index finger at someone, usually interpreted as an accusation; shaking hands, expressing respect and trust; and scratching or distractedly doodling when listening, or playing with a pencil or keys – this is often taken as being negative because it suggests that what the listener hears is not as important as the other action that is happening at that moment (i.e., the communication).

5) *Listening with the lips.* Commonly this relates to smiling, laughing, sighing or humming. Sometimes repeating part of what a participant has said is also a sign of active listening.

6) *Listening with body and mind.* This expresses that it is important to be attentive so that the person commenting can capture hidden thoughts and intentions. It is essential to process the information offered, analyse it, and draw conclusions. Capturing the basic idea of a discussion and interpreting the data are both important.

7) *Formulating stimulating questions.* This is addressed in the next part of the text.

According to Kurčíková and Šolcová (2018), working with silence is also very important. Older adults do not always have pre-formulated answers and they need room to think, so it is important to be patient and wait. There is a crucial difference between an awkward silence and a thoughtful one.

Asking questions. Skill in asking questions helps both the facilitator and the participant of the reflection open doors that are closed or forgotten. A question has the power to automatically send us off in search of an answer (Kurčíková & Šolcová, 2018). It remains important, however, to realise that it is often more beneficial to ask one brief question and remain silent for a moment afterwards (Brumovská & Seidlová Málková, 2010). When reflecting, we want to focus attention more on something that is outside the attention of the older adult with whom we are doing the reflection. We need to realise there was no formulated answer prepared (Kurčíková & Šolcová, 2018).

Closed questions and open questions both have a role to play as part of a reflection, depending on the situation you are in during the process of conducting the reflection. Closed questions start with a verb, such as *'Can you imagine this differently?'* and, *'Do you think this procedure...?'*. Even though closed questions are often associated with a negative connotation, I consider drawing attention to both the disadvantages and the advantages of these questions in reflection is important.

Open questions, such as *'How will we solve...?'*, *'Who will get...?'*, *'What do you want to improve...?'* and, *'What can you learn from...?'* offer more possibilities and help to develop the reflection and conversation of the learner. One of the prerequisites for successful reflection is orientation in the types of questions, because multiple and well-intended questions can rather frustrate our efforts to find out what the participants are really thinking. Questions can be further divided according to various criteria, for example in line with their research purpose, as in the following examples (Kurčíková & Šolcová, 2018, www.dofe.sk, www.eduma.sk):

- Survey questions. Their aim is to find out as many facts as possible and to become familiar with the situation. The speaker usually knows the answer. Examples: *'What is the current status?'*; *'What is your favourite activity...?'*; *'How much time do you need...?'*
- Instructive questions. These are instructions disguised as questions. Examples: *'Shouldn't you name it first?'*; *'Do you think this is the right solution?'*; *'Shouldn't you speak with...?'*

- Guiding questions. A variation on closed questions; it seems to be an open question, but it will be supplemented with a 'correct' answer. Example: '*How would you describe the feeling when completing the task? Resentful?*'
- Suggestive/manipulative questions. The problem in asking these is that the answer is incorporated into the question. Example: '*Do you not want to talk about it anymore...?*'
- Constructive questions. These are open questions that most develop the participants. These include hypothetical questions that will help in a situation with a problem or a block that we cannot get through. Typical examples (there are various variations in existence) include: '*If everything is possible, what would you do?*'; '*If there were 30 hours in a day, how would you assign tasks?*'; '*If we had unlimited time, what would you want to do?*'. Such questions expand and open up new possibilities, which we then explore with narrower questions, such as: '*What are your sources?*'; '*Where else can you get financing?*'; '*Who do we contact for cooperation?*'

Feedback is one of the most important factors for communication, because it allows participants in the communication to determine whether their thoughts and ideas have been heard (Pešek et al., 2019).

Giving feedback is an ongoing process, often unconsciously. Feedback can be via verbal and non-verbal communication and provides a person with information about how their behaviour is affecting their surroundings (Hupková, 2011). The goal of feedback is a fair evaluation and identification of strengths, weaknesses and opportunities for human development. Feedback is not merely friendly advice or criticism; if feedback is given correctly, it is an excellent tool for personal development. Correctly provided feedback enables solutions to be found and new challenges to be set (Brumovská & Seidlová Málková, 2010). Within feedback, certain principles are defined that are applicable to both giving and receiving feedback. Giving feedback means being clear about how to help, and involves describing a specific behaviour, and/or making constructive suggestions or appeals. The giver of feedback should also understand that the feedback is for the benefit of others and not for the benefit of the

giver. To accept feedback means it is necessary to concentrate and listen, to elucidate a situation and ask clarifying questions (but not to argue or debate), or, for example, to give a simple 'thank you' (Kurčíková & Šolcová, 2018).

As part of the reflection, the so-called sandwich system is used (also represented as + - +, i.e., positive, negative, positive feedback); this strategy, however, predicts that every positive in humans will be followed by a negative, a style referred to colloquially as the 'but' strategy. Positive feedback is needed to help people and move them to realise what they are good at, such as telling them 'I like how you communicate with people and how you approach conflict resolution'. Aside from giving feedback, it is important that the person leading the reflection knows how to accept and receive feedback. Acceptance itself can be a suitable motivation for again providing feedback.

Feedback must be specific and not a general truth; it is mainly our opinion, such as this example: *'I noticed in your communication that you smiled... What I liked was that when you were presented with the conflict you approached it nicely and it did not remain unsolved.'*

Feedback should lead to a solution, as in this example: *'I don't like the fact that you are late; this is the third time this week it's happened to you. I don't like it this way, let's agree on how to proceed.'*

Feedback is information for the other person (YOU), how (I) perceive him or her and how (I) experience contact with the recipient; it is desirable to learn to talk effectively ABOUT YOURSELF (about your feelings and your experiences). Such feedback is formulated in the so-called 'I statements', also called 'I communication'. This is a chance for students to express their dissatisfaction with something, to express an opinion about something, or to take a stance on some action of a participant without evoking further conflict or incitement to aggressive action. This is a non-confrontational and non-accusatory expression of dissatisfaction with the participant who is causing us discomfort with his or her behaviour (Hupková, 2011).

Take note of the following statements and ask yourself:

'What emotions does statement A evoke in us compared to statement B?'

A: What you say is incomprehensible.	B: I do not understand what you are saying.
A: What you suggest cannot be understood.	B: I do not understand what you are suggesting.
A: You won't make it.	B: I would not be able to do it in your place.

It is evident that the A statements have a more confrontational charge than B statements, and it is necessary to analyse what the difference between them is.

In all the A statements, the participant receives a message about themselves from us. We turn to them. This is why they are called 'YOU' messages. The participants in education may be sensitive to a 'YOU' message, because it relates to him or her personally and often contains an element of evaluation. The learner may feel that we are making reference to him or her 'between the lines', implying: 'I am expressing an evaluation about you because I am smarter and more capable'. If the statement is actually understood in this way, it can create a conflict. What the B statements have in common is that the learner receives a message about us, the person giving feedback, rather than himself or herself. This is why they are called 'I' messages. An 'I' message is generally more pleasant for learners because it does not speak directly about them, even though it relates directly to them. This reduces its potential conflict charge.

'I' communication has certain elements which, when observed, guarantee that we will avoid conflict. It is important that we state our objections in a non-aggressive but emphatic way.

Hupková (2011) expounded the structure of 'I' communication as follows:

1) We do not open the conflict by blaming a participant, but by naming our negative emotions, which the learner evoked in us with his or her behaviour.

'I feel...', *'It bothers me...'*, *'I'm uncomfortable...'*, *'I'm angry that...'*, *'It surprised me...'*,
'I'm afraid...'

2) We address the learner in a non-judgmental way; we evaluate behaviour, not personality – we try only to describe the specific behaviour that we want to draw attention to.

'I am angry that you are twenty-four minutes late.' (A 'YOU' statement: *'You are irresponsible, you are always late'*).

'It makes me uncomfortable when you yell at me.' (A 'YOU' statement: *'You're noisy' or 'You're just yelling all the time'*).

3) We propose options for resolving the situation, our expectations, or we try to get more specific information through questions.

'Did something happen to make you late?'

'I will only talk with you when you calm down and speak to me in a calm voice.'

Tip: When describing a learner's behaviour, it is not appropriate to generalise and use the expressions 'always', 'never', 'forever'; 'I' communication is communication in the here and now.

Reflection has its principles, which are described by Rossová (2016) as the following:

Principle 1: Create a safe environment where each participant is heard and not judged.

Sit in a circle and pay attention to the learning participants; give space to those who have not expressed their feelings to support this atmosphere.

Principle 2: We encourage everyone to speak for themselves and to be specific. We ensure that we ask everyone for their opinion, which creates a space for all involved to express themselves.

Principle 3: In the case of negative emotions or attitudes towards lived experience, it is not appropriate to defend the given activity or deny the feelings of individuals. A lot can be learned from failure or discomfort.

Principle 4: Set the rules of reflection and ensure that what was said during the reflection does not go further than being spoken in the room. Reflection can be a basis for setting up future activities or a stimulus for resolving potential crisis situations; however, we do not make a record of the reflection, such as make an audio or video recording or take notes. If we use a written form of reflection we can keep them, of course, but we handle the content sensitively.

Principle 5: Use different techniques appropriate to the age and type of activity.

Brozmanová Gregorová et al. (2014) proposed that reflection can be implemented on several levels:

- Intrapersonal level – used in connection with self-awareness; it is a self-reflection of the feelings of individuals, their knowledge, experience and skills. (*‘What did you learn about yourself?’; ‘What was the easiest/hardest for you? Explain why.’; ‘What new information did you learn?’*)
- Interpersonal level – reflects what is happening in the group and the sharing of experiences from group work, during which social learning takes place, i.e., discovering what older adults have learned from each other. (*‘What did you learn about others in the group?’; ‘What did you learn about yourself while working in the group?’; ‘What are the strengths of your group?’*)
- Level of application – represents the transfer of what we take and apply from experience and subsequent reflection; it is a search for connecting experience with theoretical knowledge. (*‘How can you use what you have learned in your life?’; ‘In what other situations will you use it?’; ‘What would you recommend to others?’*)

3.2 Preparation and Implementation of Educational Reflection for Older Adults

The planning and time requirements necessary for carrying out reflection are always linked to the set educational goals. We carry out reflection after applying a specific method or technique in connection with maintaining continuous motivation. There are two main reasons why continuous reflection is used when motivating older adults in education: firstly, to encourage them to become aware of the initial results of their education; and secondly, to reflect on the fulfilment of their own educational expectations and needs. During a longer programme – a course, training, webinar, etc. – I include it after each larger unit or after a few days. Sufficient time needs to be set aside for reflection; it should not take place ‘when there is time’ during packing and tidying up. Sometimes the reflection about a team activity will last even longer than the activity itself. This should take place right after the experience, while the feelings from the activity are strong and unaffected by other stimuli.

As well as the ongoing reflection throughout the course, a final reflection also has value and is therefore carried out. Some educators listen to people’s expectations and concerns at the start of the educational process because these elements are a suitable prerequisite for conducting the final reflection (Nemcová & Šolcová, 2020). These three times for reflection can be approached as follows:

- *Reflection in the initial phase* of the education of older adults takes place at the start of the educational process and serves to express what the participants of the education know about the given topic, their initial ideas and opinions, how and where they got their opinions and ideas, their expectations from the education, and their ideas about what they will learn and how they feel about it.
- It is possible to carry out *continuous reflection* spontaneously, although we recommend creating a structured time for reflection as part of the educational plan. This form of reflection is focused on what the learners pay attention to during their programme of education. In the case of long-term education, it is advantageous if the learners record their experiences and the fulfilment of tasks and duties in some way or take notes that will help in the final reflection. When reflecting during the course of their programme of learning, participants

sometimes express stimulating thoughts or recommendations that improve the effect of their activities and deepen the experience they acquire (Kurčíková & Šolcová, 2018).

- It is important to conduct the *final reflection* as soon as possible after the end of the education period. This reflection looks back and seeks connections between the result of the activity and the result of learning; it is also possible to look forward, because it shows how the acquired experience can be used in future activities. This is, therefore, a process that serves as a retrospective view on the gains and losses from previous experience and what has been achieved, while at the same time connecting these experiences to future activities and wider social contexts.

There are no universal activities for carrying out a final reflection. Various methods can be used, from individual written reflections, through mutual sharing of experiences and their reflection in groups, to creative forms, pictures or cards, etc. (Brozmanová Gregorová et al., 2014). The educator could ask the more experienced participants to propose a reflection approach for themselves and others. It is important, however, that the reflection relates to the educational objectives. Professional literature on the matter offers a varied palette of methods, techniques and specific activities for conducting reflection, and many methods are available that influence particular techniques of reflection in lifelong learning. Kurčíková and Šolcová (2018) recommend:

- Communication techniques – this is direct verbal communication with the participants of education. With reflections on a larger educational event, we can prepare a few questions on a flipchart in advance, and the participants will have time to think about, or perhaps write down, potential answers. They can then select which ones to answer. Some common techniques are conversation, discussion, and a communication wheel.
- Projective techniques – in the framework of awareness of subconscious processes, we can use projective methods through which the participants in the

education can express themselves; these could be picture cards, characters, colours, and so on.

- Written techniques – these can be used independently or as a basis for an interview. It is good if written techniques are not the only reflection strategy used; the whole group should have a chance to listen and speak together so that they have the opportunity to be enriched by the opinions, attitudes and feelings of their peers – the theory of social learning. Written activities can include simple questions, essay writing or other more interesting structures.
- Opinion/graphic and dramatic techniques – this is about expressing yourself by selecting a graphic symbol, a drawing, or a dramatic representation. These are the various so-called pies, targets, barometers, smileys, taking a stance in the shape of a statue, and the like. The choice of reflection technique must be made sensitively, and its use should be planned appropriately, as should thinking about a suitable time to conduct the reflection.

4 DIGITALISATION OF SOCIETY AND ITS IMPACT ON THE EDUCATION OF OLDER ADULTS

Digitisation (also spelled digitization) is the process of converting analogue data, images, audio recordings and other analogue information into a digital format. A digital form is represented as numbers that can be easily processed and stored by a computer system. Digitisation is followed by digitalisation (also digitalization) as society embraces digital trends; digitalisation has many meanings but refers to the general use of digital tools and the process of moving old systems to a digital format. Digitalisation is the integration of digital technology into our everyday life and embraces many different fields, such as information technology, culture, medicine, research and many others. It also has a major impact on society, enabling faster and more efficient access to information, data storage in electronic form and the easy sharing of data on the internet. This process is a key factor in the modern world and influences many aspects of everyday life. The changes occurring in society due to digitalisation represent a challenge for older adults.

Digitalisation has an impact on the functioning of society in several ways:

1. *Access to information* - digitalisation enables rapid and easy access to an enormous amount of information via the internet. People can search, retrieve and share information almost instantaneously, which affects the way they get information, learn and communicate.
2. *Communication* - digital communication, including e-mail, social media and other online tools, has changed the way people communicate, both personally and professionally. It enables a faster and more efficient exchange of information and connects people all over the world.
3. *Economy* - digitalisation has a fundamental impact on the economy. Businesses use digital technologies to improve efficiency, automate processes and develop new products and services. Online commerce and electronic payments are increasing and changing the way we shop and pay.
4. *Employment* - digitalisation is changing the structure of jobs. The automation of certain work activities may lead to job losses in some industries, but it also

creates new opportunities in the field of information technology and digital content.

5. *Education* - digitalisation of the education system is evident in the system of online education, e-books and other digital tools that are changing the way we learn and access knowledge.
6. *Healthcare* - digital patient records, telemedicine and digital diagnostic tools are all improving patient care and disease diagnosis.
7. *Culture and entertainment* - digitalisation has also affected cultural production and the development of new forms of entertainment, including video games, online media and digital music.
8. *Data Management* - organisations and governments are using digital technologies to better manage data, which helps in decision-making and policy planning.
9. *Changes in social behaviour* - digital media and social networks can affect social behaviour and opinions, including the spread of disinformation.
10. *Security and privacy* - as more and more data is available online digitalisation is bringing new challenges in cyber security and privacy.

The impact of digitalisation on society is complex and diverse. It can simplify and make many processes more efficient, but it also brings new problems and challenges that require adaptation and solution. It is important to ensure that digitalisation serves the good of society and individuals and that security and privacy principles are complied with.

If older adults want to understand the modern world it is necessary for them to develop their digital skills and competences in order to follow social changes. As members of society, they must communicate, exchange knowledge and information and communicate digitally; however, they have to cope with the challenges of using information technology and digital devices at home and the digital services that connect them to society.

According to the European Commission in 2019, only 16% of the population aged 55–74 had, at a minimum, basic digital skills; furthermore, as little as 6% of this same

demographic had higher digital skills. Participation in one educational activity with the aim of increasing digital skills was reported by 10% of EU residents aged 55–74, while in Slovakia the figure was 24%. Among the most common obstacles for not participating in further development, older adults mentioned financial reasons, time demands, lack of motivation, the difficulty of learning, and low awareness of the programmes available. We can consider older adults and other disadvantaged groups who do not have digital competence as digitally excluded, which is a category of social exclusion, since they cannot fully participate in social life. The consequences include, for example, the impossibility of finding a job in positions that require digital skills, limited use of eGov services, the impossibility of buying goods and services on the internet, and limited access to culture (such as e-books, online exhibitions, performances, among others). Older adults also lack communication with family and contact with wider society (e-mail, discussion forums, chats, and so on) (Partnership Agreement, 2021).

There should be support available to prevent the marginalisation of older individuals due to new technologies. Educational programmes and projects, at both the local and international levels, could include computer workshops delivered by universities and academies of the third age, as well as utilising the cooperation of libraries and clubs for older adults. New technologies open doors to new opportunities for older generations⁵ through informal learning; therefore, all educational initiatives aimed at combating the digital marginalisation of older individuals should be considered as key in the field of education.

4.1 The Impact of Digitalisation on the Education Process

Education is a dynamic process that includes many factors. It is founded on interaction between people and is conducted under constantly changing conditions. The *Programme for the Digital Transformation of Education – Proposal* states that it ‘... currently subscribes to the defined European framework of personal (self-regulation, flexibility, well-being), social (empathy, communication, collaboration) and learning how to learn (positive thinking, critical thinking, learning management) life competencies’ (JRC, included in The Ministry of Education, Research, Development

and Youth of the Slovak Republic, 2020). Schools and universities are generally understood as the main space for education; however, the importance of informal education is notably strengthening, and its significant connection with formal education is necessary to give it validation. The OECD sees school as a learning organisation that should continuously respond to stimuli from a broad circle of partners and thus create conditions for constantly changing and developing education (Schleicher, 2016).

Digitalisation has clearly not bypassed any sector, and education is no exception. The benefit of 21st-century technologies is undeniable, and sooner or later they will be a part of our everyday life. The incorporation of information and communication technologies in education, the increasing of digital literacy, the creation of e-learning applications (e-content, e-portals, educational software, e-materials with digital content) at the regional and national level with links to the EU freely accessible to schools and including access to a central archive of digital educational content, the provision of opportunities for education to everyone without distinction, as well as the support of studies in this field, have for decades all been addressed by several legislative measures, challenges and projects. We have selected only some of the great many steps and plans to look at in more detail; however, first we shall attempt to clarify the abbreviation ICT, as known as information and communication technologies. Several authors deal specifically with the concept of ICT in pedagogy.

Stoffová et al. (2001, included in Kadnár, J., Kadnár, M. 2011) understand ICT at the most general level as the methods, procedures and means for the collection, storage, processing, verification, evaluation, selection, distribution and timely delivery of the necessary information in a balanced form and quality. Vasil'ová and Alcnauer (2003, included in Kadnár, J., Kadnár, M. 2011) characterise ICT as the aggregate of technologies used in the processing of information systems. On the other hand, Kalaš (2011, included in Kadnár, J., Kadnár, M. 2011) understands 'ICT' to denote computing and communication means that support teaching, studying and other activities in the field of education in various ways. Kalaš observes that with the complex integration of ICT in learning, it can be seen that students ask more questions, have more courage to take risks and try harder to achieve their goals, have more motivation to search for

answers, and use richer information sources and more tools. Šušol, Hrdináková and Rankov (2005, included in Kadnár, J., Kadnár, M. 2011) state that ICT offers tools that have brought a new quality of working with information and information resources and mean a significant change in work processes. This is also supported by Hrmo, Krelová and Tóblová (2009, included in Kadnár, J., Kadnár, M. 2011), who further emphasise that the use of ICT in the teaching process is not possible without suitable teaching aids and didactic techniques.

Several authors and organisations have formulated the advantages and disadvantages offered by the use of ICT resources (Kadnár, J., Kadnár, M. 2011; Nocar et al., 2004, included in Stehlíková, J., Špačková, L., 2011; Intel, 2010a; Intel, 2010b; Pavlovkin J., 2010; Pavelka, J. 1999). We have summarised these as follows:

- They create conditions for productive and effective teaching and stimulate the creative activity of the student; they also help educators influence learners more effectively by using new forms, methods and organisation of teaching activities.
- The method of communication is immediate, very effective and individualising (it enables independent work at an individual pace - the student chooses the variant and transition to the programme, the speed of work, the frequency of repetition of the individual parts, the selection of information on the given topic, and so on).
- They combine image, text, sound, video and animation, and this enables the perception of information by several receptors at the same time; thus, information is acquired more efficiently.
- The length and number of video sequences, animations, images, diagrams, etc. used is precisely adjustable in advance and can be flexibly changed as needed during projection.
- They offer the opportunity to quickly return to any slide or part of it, as well as extensive branching options with varying degrees of difficulty for students of different proficiency levels.
- There is the possibility of using a broad scale of links to other electronic documents, websites, applets, experiments, etc.

- A suitably adapted presentation enables feedback in the form of solutions to the questions raised in the presentation, additional problem-oriented simulations and models, or real experiments.
- There is the possibility to work with information on the internet, both offline and online, depending on one's own discretion, intention and teaching goals.
- The academic results of students with a reduced ability to learn can be improved - e.g., if they have the opportunity to solve tasks through simulation programs, videos, games, and so on.
- They enable a quick way to innovate and update the education content, with the possibility of providing information in a live manner when applying and using various tools and programs.
- The presentation of video sequences and photographic material from the internet significantly saves time and financial resources compared to procuring them in another way; the inclusion of parts of a presentation in the individual phases of the teaching unit is also technical and timesaving.
- They enable teaching to be improved by illustrating knowledge or skills that were previously insufficiently mastered due to the impossibility of showing them (e.g., phenomena and processes that cannot normally be observed in formal learning conditions).
- Suitably constructed teaching programmes enable the teaching process to be speeded up, which makes it possible to put more emphasis on repetition, as well as the use of practical tasks.
- They develop user access to technologies and ways of working with information.
- They contribute to the development of self-regulation and self-control and enable a quick connection with the world (with practice).

However, the use of ICT resources also brings the following problems:

- New educational technologies make the education process more technically demanding (incompatibility of components, reliability of technology) and more expensive (especially considering the initial costs).

- The potential dependence of education centres on technologies will constantly require change, i.e., updating, innovation and practice in their control, constant administration, construction of local networks with the possibility of connecting to the external environment, and so on.
- The teachers and lecturers themselves and the management of education centres have not yet come to fully appreciate the need for, and advantages of, computer technology; there is still a shortage of qualified educators capable of operating it to its full potential.
- Computer technology can unfavourably affect human health: exhaustion, vision problems, orthopaedic problems.

The incorporation of ICT and the use of digital technologies in education in the Slovak Republic is supported by several legislative amendments. For example, *Millennium – National Education and Training Programme in the Slovak Republic for the Next 15 to 20 years* (Millennium, 2021) mainly deals with connecting schools to the internet and retraining teachers. The *Digiškola* [DigiSchool] project, incorporating the national project *Electronisation of the Educational System for Regional Education*, was approved in 2013; its main goal is to equip digital classrooms with digital educational content and to train teaching staff. The project was completed in 2015. Schools received 5,680 sets consisting of an interactive whiteboard and a laptop. Twenty thousand tablets, 1,000 Wi-Fi routers and 2,686 colour printers were also distributed. The digital content of this set, which is currently accessible on the website <http://dvo.digiskola.sk/>, is intended for primary and secondary schools of the Slovak Republic, as a supplement to textbooks, learning texts and workbooks (Digiškola, 2021). In 2018, the Government of the Slovak Republic approved the *National Programme for the Development of Education and Training. Quality and Accessible Education for Slovakia*, which, it states, ‘ will determine the direction of Slovak education for the next ten years’ (2018 – 2027). The document consists of 12 sub-goals (six for regional education and six for higher education) and 106 measures (Minedu et al., 2018). The basic starting material is the *Slovakia Learning* document, prepared in 2017. Another important document from The Ministry of Education, Research, Development and Youth of the Slovak Republic is the *Informatisation*

Strategy and Action Plan of Society in the Slovak Republic, which states the following main strategic aims:

- To educate a flexible and competitive workforce capable of applying itself in the conditions of the information society using the advantages that informatisation brings.
- To enable education for all persons in the Slovak Republic as a follow-up to lifelong education.
- To increase the competitiveness of Slovak education in terms of quality and forms of education when compared with advanced EU countries.

It is necessary to do the following at all levels of education to achieve the presented goals:

- To ensure the necessary information and communication infrastructure.
- To create conditions for obtaining and maintaining high-quality teachers.
- To innovate the content and form of teaching, including the digitisation of libraries.
- To ensure the digital literacy of employees in the state and public service (Minedu et al., 2010).

Another measure of the *Programme for Digital Transformation of Education – Proposal* is support for digital competence for the 21st century and the search for opportunities for both teachers and learners to develop it effectively. Digital skills and digital competence are defined in more detail by the *Joint Research Centre (JRC)* document entitled *European Framework of Digital Competence for Citizens*, abbreviated as DigComp. DigComp 2.1 describes twenty-one areas of competence, divided into five sections:

1. Information and Data Literacy – the main topics of which are: identification, search, assessment and use of information from various digital sources. The includes the ability to process and organise data and information.
2. Communication and Collaboration – the main topics of which are: effective communication through digital tools and media and the ability to cooperate with others through digital platforms and tools.

3. Content Creation – the main topics of which are: the ability to create and publish digital content such as texts, images, videos, audio and other media. The correct use of content editing tools is also covered here.
4. Safety – the main topics of which are: the ability to protect your own personal data and privacy online. Computer security includes the ability to identify and respond to various digital threats and risks.
5. Problem Solving – the main topics of which are: the ability to identify and solve problems using digital tools and analysing and finding solutions for digital problems.

DigComp is a framework developed by the European Commission for evaluating and describing individuals' digital skills and digital competence. This framework is used to measure people's level of digital and ICT skills. In 2022, the DigComp 2.2 framework was specified; it provides more than 250 new examples of knowledge, skills and attitudes that help citizens work confidently, critically and safely with existing digital technologies, as well as those new and still emerging such as artificial intelligence systems (Vuorikari et al., 2022).

The task of educators is to prepare students for life and work in a digital society. Therefore, in 2017, the JRC specifically prepared a European framework for the digital competence of educators (DigCompEdu), which describes 22 areas of competence for teachers in the field of using digital technologies, which it classifies into six sections. DigComp is a framework of digital competencies, but it does not include a method for developing or learning them, nor does it assess digital competence (Minedu et al., 2020). We consider that only experienced teachers who are digitally capable can develop these skills in their students and set an example for them.

Digital technologies can be an effective means for developing these skills to varying degrees. Information Technology Laboratory (ITL) research has shown that the quality of the tasks that the teacher assigns to learners has a significant impact on developing skills for the 21st century. One of the approaches that reflects the efforts to develop 21st-century skills and digital competence in teaching is represented by eduScrum. This is founded on the belief that if we want pupils and students to become

professionals in the 21st century, they need to have autonomy, skills and purpose. EduScrum, however, is not the only framework for developing skills for the future. The educator and his or her specific competencies, including digital ones, play an important role too (Minedu et al., 2020).

We identify with the statement made in the *Programme of Digital Transformation Education – Proposal* that ‘...technology is unable to and cannot replace a professionally developed teacher’ (Minedu et al., 2020). The potential for using digital technologies is wide, however, and educators as well as learners need to be digitally literate in order to use these resources to their advantage. The active use of such resources in education also indirectly develops the digital skills of all stakeholders. We view the digital transformation of education as a means, and not a goal in itself. The authors of the *Programme of Digital Transformation Education – Proposal* point to the fact that ‘...efforts for the digital transformation of education in our country have thus far been ineffective. All projects, initiatives and concepts thus far implemented remain without an initial or final long-term analysis of their impacts and sustainability; no new concept devotes attention to identifying the reasons why previous initiatives need to be repeated or replaced’ (Minedu et al., 2020).

Older adults, as well as many employees of public administration over the age of 55, often do not have the necessary digital skills to fully embrace the digital society. This can lead to their social exclusion and difficulties in finding a better-qualified job. This is also why the Ministry of Investments, Regional Development and Informatisation of the Slovak Republic, in cooperation with the National Coalition for Digital Skills and Professions of the Slovak Republic, launched a national project in 2021 called *Improving the Digital Skills of Older Adults and the Distribution of Tablets for Seniors*, through which Slovakia responds to the current situation and the effects of the pandemic on the most vulnerable groups of the population. Its main goal is to improve the digital skills of public administration employees over the age of 55, disabled people, and pensioners who do not belong to the senior group (i.e., they are under the age of 65 and have been granted a disability pension or an old-age pension) and older adults over the age of 65. Improvement in their digital skills is achieved through face-to-face education and e-learning. Another aim of the project is to provide data packages to

those older adults who have already trained with suitable technological devices, with the intention of increasing their motivation to use electronic services and e-learning training. Before this initiative no similar project had thus far been implemented in Slovakia. The training programme is prepared on the basis of recommendations from the preparatory study of Pavel Jozef Šafárik University (Košice) and other experts with experience in the education of digital skills for older adults. It is designed to develop the digital skills needed to effectively access digital public services and actively improve the digital literacy of older adults. The digital skills training is divided into four teaching modules, and educational materials for the individual modules are freely accessible on their website. These cover the following areas:

- The basics of working with digital equipment (for computers and tablets).
- Searching for information.
- Communication online.
- Information security.

The goal of the project is to fill the current gap in adult education in the area of digital skills, since there has until now been no systematic approach to this type of education financed from public sources in Slovakia (Digit@Ini senori, 2023).

Based on the information provided above, and through the examination of literacy references and our own experiences, we have identified key topics within the IT component of education. These educational topics are further bolstered by additional training from various thematic units from informatics, as outlined in the following programme for the University of the Third Age course entitled 'Active Ageing Using Computer and Smart Technologies':

- Introduction to the issue of information and communication technologies.
- Basic settings and configurations of work in a tablet PC.
- Internet browsers (Firefox, Google Chrome, Opera, Edge) and basic work with them.
- Creating an e-mail account. Basic work with selected Google applications.
- Searching for information on the internet – basic terms, techniques, search engines, printing information.

- The possibilities of communication in the digital space – e-mail and Skype.
- Social networks and communication with practical mastery of the Facebook application.
- The world of photos – creating your own photo album or postcards.
- Processing text and working with the MS Word text editor.
- Work with files and directories.
- Work with preparing documents and images for printing.
- Security and privacy on the internet.
- Shopping on the internet, ordering goods and services.

4.2 The Possibilities of Communication in the Digital Space – Samples of Good Practice When Teaching Older Adults

Several options for communication are available in the online space. The basic options include the following:

- Text communication is one of the most common ways of communicating in the digital space. This includes the exchange of written messages through various platforms, such as text messages, e-mail conversations, online chats and social networks. This method of communication is suitable for exchanging information, quick questions and answers or longer discussions. E-mail is an electronic form of communication that enables the sending and receiving of written messages between users via the internet. E-mail is widely used both for professional communications and personal purposes.
- Voice communication allows people to speak and listen to each other by means of voice calls. This is possible using telephones, smart devices, voice recordings, as well as software for voice calls (for example VoIP applications = *Voice over Internet Protocol*). Voice communication is more personal than text communication because it involves a real voice and intonation.
- Video communication enables users to see and hear each other in real time. This form of communication is often used by means of video calls or video conferences that provide visual interaction. Popular applications that provide

video communication capabilities include: Skype, Zoom, Microsoft Teams, Google Meet and FaceTime.

- Social networks are platforms that allow people to create a profile, connect with friends, share content, comment and interact with other users. These platforms offer text, image and video communication through posts, comments, private messages and live broadcasts.

Each of these forms of communication was used and practised with the course participants. For e-mail communication, we chose the most popular and commonly used e-mail service, namely Gmail, offered by Google. We included elements such as: adding a contact, setting a signature, setting an automatic reply during unavailability, sending an e-mail, replying and forwarding an e-mail, changing the settings, as well as the Drive cloud storage service and the tool for creating and participating in Google Meet video conferences. In the context of e-mail communication, we also focused attention on the topic of hoaxes. We applied the clarified knowledge and practical skills to the problem-oriented task of creating a claim for goods ordered, together with an attachment consisting of a photo and a description of the damaged products. We chose Skype to illustrate a communication application that allows users to communicate with others through voice and video calls individually or in groups, text messaging, chatting and screen sharing, and file transfer over the internet. We also included the advantages and disadvantages of other individual applications for internet communication, such as Zoom, Microsoft Teams, Google Meet, WhatsApp and FaceTime. Participants in the course went through the process of downloading the installation file and then they completed the installation on the computer or device. They created their own account, adopted the digital environment, tested the settings for use and verified in practice the communication options offered by the application. They familiarised themselves with the possibilities of social networks with the practical adoption of the social network 'Facebook'.

4.3 The World of Photographs – Creating Your Own Photo Album/Postcards – Examples of Good Practice When Teaching Older Adults

The goal of this module is to familiarise the participants with creative work in the context of photographs. It also practises downloading photos from mobile phones, cameras and cloud storage to a computer or tablet. While creating a photobook or postcard, course participants enlarged their skill set in regard to working with text through the module 'Processing Text and Working with the MS Word Text Editor'. We used freely available software solutions for our work; for the creation of the photo album we used the CEWE photo software (<https://www.cewe.sk/>), which has a number of instructions in the Slovak language, but other products were also used. Given the time-consuming nature of creating such outputs, we tried to select a product that the course participants could work with independently once they had mastered the basic functionalities. We used the online platform 'BeFunky' to edit photos (<https://www.befunky.com/>).

4.4 Processing Text and Working with the MS Word Text Editor – Examples of Good Practice When Teaching Older Adults

Text communication is also developed by obtaining practical skills practised in the MS Word text editor. The main topics we cover in this module are:

- Opening/closing a word processing application.
- Creating a new document and creating a document based on a template.
- Saving the file to a specified location, together with clarification of the possibility of the automatic saving of documents and saving documents in other formats.
- Various ways of displaying the document.
- Working with text (copying, cutting, inserting, deleting, marking text and its parts, searching and replacing within the text, etc.) and inserting special characters and illustrations into a document.
- Text and paragraph formatting along with using the 'copy format' option, as well as clarifying the advantages of applying styles to document text.
- Formatting a document, preparing a document for printing, and spell checking.

We then applied the clarified knowledge and practised skills to a problem-oriented task; this involved cancelling an insurance contract for a personal vehicle, which had to be communicated to the insurance company in writing but not via e-mail.

4.5 Safe Shopping and Payment on the Internet – Examples of Good Practice When Teaching Older Adults

Shopping online can seem a daunting task to those who are unfamiliar with it. However, with a little care and armed with knowledge, buying goods and products can be fun, productive and a great place to find a bargain or niche products that are unavailable elsewhere. It is important to observe the following, which are directly related to shopping and paying in an online store.

1. A trusted seller is the first step. There are various portals that rate online stores, such as heureka.sk, where we can see people's reviews of the given store, their experience with sales, the time for the delivery of goods and possibly also the method of complaint or returns. Suspicious online stores usually have a strange internet address, very low prices, weak product descriptions, poor product translations, incorrect information and we often cannot find ways to complain. A trusted seller must have terms and conditions published on the site, as well as terms and conditions for returning goods. It is important to pay attention to the name of the website, as scams often occur in which various so-called 'phishing' sites look like well-known shops.
2. Payment by card. Use card payment only when the website has the abbreviation 'https' at the beginning; this means that the website uses an SSL certificate and thus the communication is secure. There is usually a picture (icon) of a lock next to the https abbreviation, which can be clicked to find out who the page belongs to. Do not pay with a card over public Wi-Fi networks. If you need to pay for the goods, it is better to use mobile data, or have the goods sent cash on delivery. Another option is to pay using a credit card, which is often more secure in the case of fraud.
3. Payment gateway or Internet banking. With payment gateways, security is mostly ensured by 3D Secure, which is designed to verify the cardholder's

identification (often with this method, a window appears where additional identity verification is required), as well as the owner's identity with the card issuer. Another option is to pay online via PayPal.

In the practical part of this lesson, we use examples to show the difference between information and data. We demonstrate how to create a strong password and then, using an online password strength verification tool, we check the strength of the password. The course participants are also shown fraudulent e-mails, phishing communications, ransomware etc., along with how to purchase products on the internet, how to use the web portal heureka.sk, and how to proceed if we need to pay for the product using a payment card.

4.6 Virtual and Augmented Reality in the Life of Older Adults

Active ageing of older adults represents the active attitude of older adults towards life. One of the ways to take an active approach to life is to know, explore and integrate information and communication technologies in various activities in the life of the older adult, such as services, leisure, online shopping and many others. Among the rather wide range of these ICTs, we have chosen to focus our attention on technologies concerned with virtual reality (VR), augmented reality (AR) and mixed reality (MR). In general terms, we can characterise these technologies as those that can either simulate the real world or generate environments that are fictional. VR creates a three-dimensional (3D) environment in which users can interact using specialised devices, such as VR controllers, with which the entire simulated environment can be managed in a virtual application. In terms of usability, VR, AR resp. MR technologies have a wide range and possibilities of use, and they are employed and growing in many different industries and fields.

Through mass diffusion and over time, these technologies have found applications in industries such as healthcare, education, science and research, and robotics and innovation. They are also increasingly associated with training, where virtual environments provide realistic simulations for practising knowledge, skills and learning in a safe and controlled environment. There is also a huge interest in the use of virtual

or mixed reality in the field of medicine; through VR, AR or MR it is possible to train doctors in certain surgical procedures and rehearse complex procedures without the need to experiment and rehearse initial experiences on real live patients. The result in such a virtually controlled environment is that the doctor practises a specific procedure safely while building the confidence to proceed with difficult procedures in the real world. Another valuable medical application of virtual reality is the simulation of various complications and unforeseen common conditions that may arise, for example, during a surgical procedure. The aim of this chapter, therefore, is to consider the possibilities of using VR and MR for older adults, to indicate on what principles both technologies are built, and the benefits and risks are associated with their use.

4.6.1 Introduction to Virtual and Augmented Reality

We consider it important to first introduce the terms virtual reality (VR), mixed reality (MR) and augmented reality (AR). According to Flavián et al. (2019), the arrival of these technologies is shaping a new environment where physical and virtual objects are integrated at different levels. However, the boundaries between these new realities, technologies and experiences have not yet been clearly established by researchers and practitioners. For over thirty years, the Reality-Virtuality continuum introduced by Milgram and Kishino (1994) has been commonly used to categorise the various forms of reality; in addition, regular users could differentiate between them in regard to the amount of interaction and the level of immersion (how they engage the user and immerse them in the issues of the virtual world). The following definitions outline the generally accepted meaning of the following terms:

Virtual Reality (VR)

Virtual reality (VR) has become a trendy IT topic between users in the past few years (Wohlgenannt et al., 2020). There are a lot of definitions in connection with virtual reality; some are based on the technological perception, and some on the user's perception or attitude. LaValle (2023) defined virtual reality as inducing targeted behaviour in an organism by using artificial sensory stimulation, while the organism has little or no awareness of the interference. There are four key components that

appear in the definition: targeted behaviour, organism, artificial sensory stimulation and awareness. Another definition by Wohlgenannt et al. (2020) understands VR as the use of immersive technologies that simulate interactive virtual environments or virtual worlds with which users become subjectively involved and in which they feel physically present. Overall, VR offers a digital environment, often referred to as a synthetic (artificially graphically created) environment, in which all the objects we work with are digital. In other words, the user puts on a pair of virtual goggles (also referred to as a VR headset) and everything he or she sees has been graphically modelled, edited, processed and embedded into the image, which we collectively call the virtual world. The virtual goggles we put on provide a 360-degree view. In addition, once the VR headset is put on, the user is prevented from seeing any real physical image and can only see the models that are embedded in the application during development, such as buildings, trees, characters, and so on. The user has the ability to control this space through VR remote controllers, known as VR controllers. On the VR controllers there are buttons through which the virtual reality applications can be controlled. Examples of specific VR headsets include Oculus Rift, HTC Vive, Valve Index, Pimax, Playstation VR, XTAL and many others.

Augmented Reality (AR)

Mixed reality is a different way of seeing and controlling the displayed image to virtual reality. After putting the glasses on our face, we still see the real space we are in (as if we had put on a pair of dioptric glasses) but AR/MR glasses integrate digital objects into this real space. For example, applications that are focused on animals could create and simulate a lion, a cat and a camel which could walk into your living room. The objects (animals in our example) could be static (no movement), dynamic (moving), or perhaps interactive, meaning that when you squeeze or stroke the animal you will hear a sound, or you can see the animal running, or the animal will change its posture, and so on. These animals are not real; they are digital and only displayed through the glasses. A further example: in the case of bad weather, one does not have to go in person to a brick-and-mortar store to buy some home accessory; AR/MR glasses can simulate items for sale. The user might select, for instance, a virtual lamp, which the

user then sets up virtually in the living room at actual size to evaluate whether the design is appropriate and to the taste of the user. After that, the lamp can simply be ordered online.

In conclusion, mixed reality is aimed at integrating synthetic objects into the real environment. This technology can make use of glasses, or phones or tablets. In addition, mixed reality by also using the hardware of the device smoothly not only 3D models are displayed in the real environment and interactions are also handled with the same quality.

4.6.2 Principles

The technology itself is built on certain principles that immediately characterise it. They are:

- *Immersion* - one of the goals of VR is to create a sense of immersion in a virtual world. This involves engaging a person's multiple senses; initially sight was designed for integration with VR and MR, but now it is common for hearing and touch to be integrated into perception to create the most realistic experience for the user. The more senses we engage, the greater the immersion in VR or MR.
- *Interactivity* - apps are created and designed to allow interaction with the virtual environment. Various input controllers are available to the user, through which they can manipulate objects, explore the environment and perform actions in the virtual world, launch or close applications, display certain attributes, and so on.
- *Presence* - virtual reality should create a sense of presence. This can be achieved, for example, in the form of sophisticated graphics, animations or soundtracks (music) that can create a convincing sense of actually being emotionally and physically present.
- *Availability* - regardless of age, gender or any other criteria, virtual reality should be accessible to everyone, although it should be noted that a few health complications can restrict users using VR or MR-centric technology. Overall, the emphasis should be on developing, where possible, headsets that are as

technologically friendly as possible, and that are affordable and easy to use for all.

4.6.3 Classifications

Currently, there are a wide variety of spectra of classifications according to which VR/MR/AR can be divided. These classifications can include classification by manufacturer, image display method, object control, wireless or wired connectivity, and many other factors.

Classification according to the imaging technology.

- VR headsets requiring a connection to a computer

Specifically, these are headset glasses (or goggles) that require a connection to a powerful computer or game console that provides processing and the display of objects. Without a computer, these glasses will not work and cannot be used; therefore, it is necessary to find out whether a particular desktop or laptop computer is suitable for connecting the VR goggles we plan to purchase. These headsets also come with VR controllers which allow (by virtue of their technical connection) control of the application, such as displaying a menu, selecting an item, and so on. Advantages associated with the connection to a computer include the speed of the display and the quality of the redrawing and movement in the virtual environment. In addition, there exists also some disadvantages. One of this limitation include a cable that is connected to the computer on one side and to the headset on the other side. In real life or in practice, the point is that when the user moves around the space, the user does not have as much freedom as if the user could have a headset without a cable.

- Stand-alone VR headsets

These are VR headsets that work (display video, sound and allow control) without the need for a desktop computer, laptop or other device. As a result, there are no cable connections required to run and use the headsets. These devices are battery operated so they need to be connected to the mains electricity and fully charged before use. The

following VR goggles fall into this category: the Oculus Quest2, the HTC Vive Focus 3, the Pico Neo 2 and the Pico Neo3.

- VR headsets for smartphones

Many smartphones are also capable of supporting virtual reality. The VR headset displays the images after the app is launched and the phone is put in a special VR headset case. How well the image is displayed and how smoothly the app is displayed depends primarily on the quality of the phone that is used. Phones that are older will generally offer a lower quality image than phones that have a higher storage capacity and a faster microprocessor. It should also be noted that these devices are purchased together with a controller that is specifically designed for use with the headsets. Installation of the device (VR headset) on the mobile phone is required. Available devices include Samsung Gear VR, Google Daydream View, Destek VR, Merge AR/VR and others.

4.6.4 Technological Trends in Virtual and Augmented Reality

Virtual and mixed reality technologies have quickly spread among individuals, companies and corporations. A lot of the new uses and types of this technology will become standard, meaning that the basic ones available today will be rendered obsolete as the technology advances. Current trends are:

Wireless VR glasses

VR goggles which no longer use any wired connection to a computer are currently very popular, and the ease of the set-up process is helpful to older adults. The advantages are clear: there is no need to consider the installation or the type of connectors needed, it can be set up and operated quickly, there is no physical interface and separate device to start up, and many other advantages.

Inside-out tracking

These needed to be installed in order to record the user's location, which is a newer technology (compared to out-side tracking) that has been integrated into VR headsets. It is based on the principle that there is no need to have multiple so-called base

stations. These needed to be installed in order to record the user's movement in the space, which was provided by tracking the movement of the controllers (controllers in the hand) and the headset (display unit). Purchasing the so-called new generation of VR goggles means that there is no longer a need for VR stations (base stations), and thus there is no need to install them, calibrate them, configure them and so on. This is a significant simplification of the preparatory phase usually necessitated before using VR goggles, which, especially for less technically skilled users such as older adults, can be considered one of the biggest advantages.

Eye-tracking

This is technology that tracks the movement and activity of both eyes of the wearer while he or she is using VR/MR glasses. It can evaluate where the user is looking, at which specific objects, and what they are interested in while the application is initialised (running). Conversely, it is possible to evaluate which objects the user is not interested in due to the fact the user did not look at or interact with them during the running application. The above technology is directly integrated into many VR glasses, although it should be noted that not all goggles automatically have the above technology as standard. If the user is interested and sees an advantage in this technology and plans to detect and evaluate where he/she has looked during the running of the programs (applications), he/she should purchase VR glasses that are equipped with this technology.

Haptic feedback

This technology provides the ability to get feedback from virtual reality through haptics - touch. This is obtained, for example, through sensors that are placed either in special gloves or in a special suit. Each sensor, such as those on a suit, can be independently adjusted (programmed) so that when a certain action is performed a slight shaking or movement of the sensor occurs, which the human body registers and evaluates as an interaction. The number of sensors can range from a just few pieces to dozens all over the body. When a user is involved in a game or application in virtual reality it is these sensors that send a signal to the human body; practically, this means that a person who is using an app to spar and practise his or her boxing skills could feel a 'punch'.

This technology is currently limited to sensors that can be applied to the arms, legs, back or chest.

VR with specific accessories

This trend is related to apps which have enhanced assistive features, for example, for older adults or people with disabilities. Examples of these special add-ons include subtitles, alternative control options, audio interpretation (for visually impaired users), speech and gesture recognition, adapted applications related to rehabilitation or therapeutic focus, and many others. By continuously improving the hardware aimed at virtual glasses, and thereby substantially increasing the level and quality of the image, basic technical limitations have been solved. Hence, the time is ripe to develop and address specific requirements for different applications and users.

Mixed reality

There has been a rapid growth and development of mixed reality applications. The usability of this technology for older adults is diverse; they could serve as a means for physical or psychological rehabilitation, cognitive stimulation, health monitoring, and so on.

4.6.5 Benefits and Risks Associated with Virtual and Augmented Reality

Virtual, mixed or augmented reality are technologies that are constantly advancing, the potential of their use is constantly expanding, and new possibilities of application are constantly being discovered. Therefore, the innovations that are tied to these technologies and the associated benefits are by no means final; on the contrary, these technologies are expected to have even newer and broader applications and developments in various sectors in the future.

BENEFITS

Virtual and mixed reality can bring benefits and advantages to the family members of older adults and help contribute to finding solutions to the need for assistance for older adults. Today, it is difficult to predict with any precision what these technologies will bring in the future, or what their future uses will be; therefore, among the wide range

of benefits that VR technologies offer and possess or offer today, we have selected those that we believe are the most widespread.

Support and development of cognitive functions and memory.

The world's population is ageing; this is particularly the case in developed countries, where one of the key issues is how to address this situation. Research has shown that with increasing age there is a deterioration of a certain spectrum of cognitive functions, most often related to memory loss, decreased attention, difficulty solving specific or mundane (everyday) problems, and decision making. It is therefore essential that innovative ways of supporting, maintaining or improving the cognitive function of older people are sought. It is virtual and mixed reality technologies that are emerging as solutions and effective tools that can significantly impact the cognitive functions of older adults. This can be achieved precisely through the fact that VR provides immersive and interactive experiences in a variety of areas, including entertainment and education, and this could impact positively on the well-being and health of older adults.

Memory impairment and dementia are two of the manifesting problems of older adulthood. Virtual reality may be just the technology through which, within a modelled (simulated) environment, it is possible to generate a unique way of stimulating memory by creating significant events in the life of an older adult. This could lead to memory enhancement through positive displayed memories and emotions, perhaps in the form of video or pictures.

Research published on the web portal of the prestigious American technological university MIT in Boston aimed to help older adults who were suffering from deteriorating memory or some form of dementia. Winn (2019) reports that the research was conducted by Rendeever, a start-up company working towards providing older adults with new experiences and happy memories of their past through a virtual reality platform; it was reported that the participants felt rejuvenated after experiencing a virtual reality session. The content involved in the VR sessions utilised content such as photos, videos, and music that held significance to the older adult's past. Rendeever enables family members to get involved by sharing personal photos and videos to enable their older relatives to reminisce about cherished moments. Additionally,

families have the option to rent a camera to capture special moments during family holidays with their older loved ones. Showing repeated recordings of past events achieves the revival of memories. The company has subsequently applied its VR experiences to more than 100 communities exclusively comprised of older adults, and it has begun to work in hospitals to offer the world of VR to patients of all ages (<https://news.mit.edu>).

Realistic experiences

Today, VR and MR do not only allow visual images; touch, and hearing are becoming more commonplace, and there are devices that can simulate certain (albeit limited) smells. This all contributes to a better perception and experience of the user. It is not unreasonable to expect that, in the near future, an application will simulate a forest which the VR user will be able to walk through, admiring the wildlife and smelling the vegetation and trees.

Education and training

Winn (2019) argues that virtual reality has an important place in education; situations and scenarios that may be difficult or costly to create in real life are suitable for recreation within VR. As an example, a mechanical engineer learning to repair an aeroplane would find it challenging to purchase an actual aircraft, but in a VR environment the aeroplane can be modelled in every detail, allowing the mechanic to learn how to fix it.

VR travel

Tourist attractions and sights can be explored without having to physically travel, which would be of benefit to older adults and disabled people. While most people would say the experience of physically attending a sight cannot be equalled in a VR environment, it is nonetheless an opportunity for those people who cannot travel to learn about and enjoy a new destination.

Cultural experiences

Cultural events such as films, concerts and other live events can be attended through VR 'in person', where the technology gives you the opportunity to perceive the environment from a 360-degree view. Once again, older adults and those with disabilities would benefit by not needing to travel to the cultural event in person; nor would they be restricted by a lack of movement or mobility within the venue itself.

Social interaction

Loneliness in older adults is a serious problem. Communication in a virtual environment would render it possible to have 'social clubs', where groups of older adults could meet and socialise in a virtual space. Physically, the people involved in the interaction would be in different locations, perhaps even different countries.

Treatment

VR can be helpful for patients who are in pain; it can act as a distraction, thus alleviating the patient's pain, by generating an idyllic environment personal to that particular patient.

RISKS

There are disadvantages associated with technologies such as VR/MR or AR, along with certain risks. These do not directly threaten the health of the older adults, but rather that are related to the display of the virtual world and the loss of perception of the real environment. The most common risks, disadvantages or limitations associated with these technologies are as follows.

Physical risks

When VR goggles are used there is an almost immediate loss of orientation of real space perception, and when the technology is used for a long time the user may experience nausea, eyestrain and the like. A rapid loss of orientation could result in a loss of motor coordination, leading to falls and injuries.

Psychological risks

The VR user may experience symptoms of nausea or dizziness. This is most often due to sensory overload, which can lead to exhaustion. Therefore, it is advisable for older

adults who want to try VR/MR or AR technologies to try them gradually and for a limited time (perhaps five to ten minutes at first). If the user has got any problems (such as: nausea or headache etc.), immediately should be interrupted the activity in VR.

Social risks

If we are discuss about social contact, these technologies (VR, MR), despite their progress, should not replace real contact based on face-to-face encounters. Perhaps in the future, there will be or exist VR-based technologies that will be able to replace personal human contact, but it would be still advisable to retain the human form of socialisation despite future progress.

The emergence of dependence

Excessive and prolonged use of virtual reality can lead users to crave constant stimulation and escape from reality. This is mainly due to the highly immersive nature of the experiences, such as beautiful computer graphics, musical scenes, and elaborate applications. All of this can lead to addictive behaviour, resulting in neglect of work, education and personal responsibilities. The emergence of this type of addiction is classified as a 'non-substance addiction'.

Privacy and data security

As VR and MR technologies increase, so does the collection and storage of personal data and user behaviour patterns. VR can collect users' biometric data without their consent.

Cost and availability

Technology can be expensive in terms of procurement; the purchase price is often in the hundreds of euros, which can make the purchase of equipment unaffordable and therefore less accessible to individuals with limited financial resources.

Unrealistic expectations

Virtual reality cannot fulfil certain ideas that users or older adults may have. It is limited, both by its hardware limitations and software limitations. Therefore, it is advisable to first familiarise oneself with the technology, to find out what possibilities it has, what it

can offer for an individual, or perhaps conclude that, for the time being, the technology cannot meet the user's every expectation.

5 ICT AND ACTIVE AGEING IN THE LANGUAGE EDUCATION OF OLDER ADULTS

This chapter examines the basic concepts and terms in the field of welfare technologies, ICT and active ageing, and looks into the methods by which they can be effectively taught in a foreign language (English) to older adults. In addition to the basic didactic categories (aim, methods, forms and means, didactic principles), we look in more detail at educational content (i.e., the curriculum). This is related to two factors in our case: the profile orientation of the lecturer and the theme of the educational programme within the project 'University Enhancing the Smart Active Ageing (UESAA)'. We aim to provide examples of good practice.

A *term* is a word or phrase that has a precise meaning in certain usages, for example, in a particular scientific discipline (linguistics, aerology, botany, physics, medicine, etc.), art, or in a profession or subject. Thus, for example, the word *momentum* from the field of physics is a term and it could be defined as a vector of physical quantity defined by the relation $p = mv$ (Teplička, 2020, p. 44). Mistrík (2002) defines a term as '...a denotation of a concept defined in the appropriate linguistic system of concepts of a given field of human activity and knowledge'. Horecky (1956) lists the following seven necessary features of a term: semantic clarity; systemicity; stability; unambiguity and precision; load-bearing; vernacularity; internationality. Cabré (1999) states that terminology (the basic unit is 'term') is a communication tool and is used by two main groups of people: direct users and intermediaries. Direct users are experts in particular subject areas, where terminology becomes an essential communication tool and an important element in the conception of the topic itself. Intermediaries use terminology to facilitate communication for other users.

The area we have focused on when teaching older adults¹ is the area of welfare technologies and ICT. Users of ICT need to be conversant with many English terms which are used to interact with computers and the like; these often do not have direct equivalents in the Slovak language. The term ‘welfare technologies’ is understood as the introduction of products and services that help older adults and people with various disabilities, such as systems for monitoring vital signs, medical care technologies suitable for home use, smart textiles, houses, and so on (Research Agency: Call for Innovation and Business Development Announced Today; EEA and Norway Grants). The term information and communication technologies (ICT) for our purposes includes all hardware and software means in converged systems for processing, storing, presenting information and communicating. It includes terminal devices (computers, tablets, mobile phones and smartphones, digital cameras and camcorders, etc.) together with the necessary infrastructure (network elements, servers, transmitters, etc.)

The generation of older adults currently living in Slovakia was educated in the period of a different political system (called socialism or communism) when the compulsory foreign language at primary schools, secondary schools or universities was Russian. There was little call for or provision of other foreign languages, with the exception of German at some selected language schools; sporadically English was available, but this was not made accessible to most of the population. Any interest in learning a foreign language other than Russian was not stimulated by the possibilities of acquiring teaching material on the Slovak market (it was rarely available). However, nowadays English terms are unavoidable in the field of ICT and it is necessary to know them, otherwise the technologies cannot be used to their full extent (or even at all). For the younger generation – from school age up to middle age – it is more natural and easier to understand English concepts and terms in ICT and often other fields, even if the individual has not yet started to learn English at school or has never learned it before.

¹ In the chapter, we use the term ‘older adults’ to refer to the age group. According to Špatenková-Smékalová (2015), the term ‘senior’ is preferred as emotionally neutral and refers to a person across the age range of senium. For educational situations, in accordance with the terminology of lifelong learning, we use the meaning-neutral designation ‘trainee’ (Špatenková-Smékalová, 2005, p. 55)

The media, computer games and the use of ICT contribute to the general understanding of English terms at large. In the field of ICT, the young generation often uses anglicisms; they do not need a translation to Slovak. The word ‘gamification’ – ‘*gamifikácia*’ in Slovak – is a case in point. It is a word of foreign origin, which is not even included in the Short Dictionary of the Slovak Language (see, for example, the Dictionary Portal of the Ľudovít Štúr Institute of Linguistics of the Slovak Academy of Sciences). However, older adults had either no such opportunity to encounter English concepts or terms at all or, if they did, it was only in a limited way. Today's era and the introduction of ICT into almost all aspects of human life requires basic user knowledge to extract benefit from them, along with an understanding of some English terms in the field. It is therefore highly appropriate and necessary that older adults are able to be independent in this field as well so as to be fully integrated into society.

5.1 Learning Objectives - Example

The overall goal of both parts of the two-part course is for the learner to understand the basic terms and concepts in the field of active ageing and welfare technologies in the English language. In the first session (delivered in the summer semester) we examined these ideas in Slovak, sought to understand them, and assigned an English word to them. In the second session (delivered in the winter semester) the aim was to understand concepts in English related to the everyday practical use of the internet, and to associate them with possible Slovak equivalents. The overall learning objective is to enrich the knowledge of older adults to enable them to partake of other technology-based practical courses, such ‘An Introduction to the PC’, and similar programmes formulated to support active ageing with technology.

5.2 Methods, Forms, and Means of Training for Older Adults

Choosing appropriate terminology for use when teaching older adults and compiling the glossary presents several challenges; the trick is selecting words that are relevant and useful, while not being overly specific or technical. The methods used in teaching the terms were as follows:

- Explanation.

- Venn diagram.
- The five-leaf clover method.

The main method that was used was explanation combined with narration; by narration, we mean the trainer's own experience that related to the content of the learning. We incorporated the narrative method into the explanation when appropriate, giving a more common, human point of view, and thus more accessible. The part where the lecturer shares his or her own experiences is always popular with trainees, and this was applied in both semesters when explaining the concepts and terms contained in the glossaries.

Another method, which we applied only in the second part of the course, was the Venn diagram method. This method, according to the authors Špatenková-Smékalová (2015, p. 133), is highly recommended when working with older adults. We handed out a blank Venn diagram on A4 paper to the trainees; their task was to mark the relevant terms in the individual circles. Circle A represented 'General terms', circle B 'Safety of the older adults living at home', and circle C 'Automation, technology, equipment'. The terms that needed to be sorted were from the exercise that the learners completed at the beginning of the class (20 terms in total). These were the following: *rollator, device, inclusion, rehabilitation, active life, company, solutions, computer, smart home, disease, antivirus program, telemedicine, internet, pioneer, level, assistive technology, switch on, application/app, emergency, education.*

We explained the five-leaf clover method using word *pioneer* as an example. When the learners were comfortable with how this method works, we used the system with a word we learned in the second semester, 'Facebook'. We formed three groups of four trainees and one group of three trainees (15 trainees in total) and adopted the five-leaf clover method from the authors Grecmanová, Urbanovská (2007, p. 92), with the lecturer acting as the facilitator. After all the groups had finished writing in the boxes, we checked whether everything was done correctly, verified the number of word classes in each line, and finally a representative of each group read the results of the group work aloud. We compared the results and drew inspiration from each other.

We taught in the form of direct instruction. The material/didactic means we used in the teaching were: glossaries (one for the summer semester, the other for the winter semester), an exercise for completing the presented English concepts and terms, a Venn diagram, and an exercise applying the five-leaf clover method.

5.3 Glossaries

A glossary of terms and concepts in the English language was written and given to learners at the start of the course 'Safe and Independent Living with Smart Technologies', to enable them to clarify and understand those which were unfamiliar. In the second semester, a thematic glossary was compiled to cover the topic 'Everyday Practical Use of the Internet: Websites and Social Networks'. The terms in the glossary were chosen in such a way that they were not too difficult to deduce the meaning of, or too difficult to remember. Although English is a Germanic language (unlike Slovak, a Slavic language), it is part of the Indo-European language family, and thus there is a certain analogy of meaning derivation – e.g., the words: *pioneer*, *robot*, *project*, *inclusion*, *infrastructure*, *service*, *technology*, *toilet*, *rollator*, etc.

The first glossary was five printed A4 pages and contained 87 selected terms in three different subject areas: General Terms, (36 terms), The Safety of Older Adults Living at Home, (25 terms) and Automation, Technology, and Equipment (26 terms). In selecting the terms for the glossary, we were inspired by the handbook published by our Norwegian partner in the joint project entitled: Nordic Ambient Assisted Living Welfare Technologies for Active and Independent Living at Home (Nordic Innovation, 2019). The handbook uses the term 'older adults' to name the target group, and for this reason we adopted the term 'older adults' in the glossary instead of 'senior'.

The glossary contained three columns; the first column listed the English term, the second column listed the equivalent in Slovak, and the third column (listed as 'notes') was blank and could be used to write down either the pronunciation or the learner's individual notes. The headings of each section were enhanced with appropriate thematic pictures (glossary – sample 1). The glossary in the second semester contained 25 terms, which related to websites and social networks.

The next text we gave to the learners was a completion exercise which contained 20 sentences. The words to be inserted were selected from the glossary.

5.4 Good Practice - Teaching English Terms to Older Adults

This course comprised of two 90-minutes lessons, one delivered in the summer and one in the winter semesters. In the motivation phase at the beginning of the first lesson we welcomed the trainees, introduced ourselves, expressed our pleasure at being able to share our knowledge in our field of study, and formulated the learning objective. We explained the importance of understanding the meaning of different concepts and terms, especially with an emphasis on being able to orientate and not get lost in a world that is full of different technologies and that uses English names for its components. We pointed out the importance of older adults' self-sufficiency and their inclusion in today's world, as well as the possibilities that today's technologies can provide for older adults – e.g., the possibility of making new friendships through the internet, communicating with family members, self-sufficiency through ordering different goods online, services, etc. A quick survey (by asking questions directly to the trainees) gave us an overview of how many trainees had any level of English language skills (we were not interested in the exact level of language skills at this stage, which we investigated in the second semester). We handed out material-didactic means – glossaries. Before the beginning of the explanation of individual terms, the trainees had the content and structure of the material displayed both on the screen and in the printed form.

In the exposure phase, we proceeded with the explanation by reading each term in English, writing the pronunciation on the board and assigning a Slovak equivalent. The pronunciation was written in a simplified form, not using phonetic characters, by similar characters/letters from the vocabulary of the Slovak alphabet, which would resemble the sound as closely as possible, e.g., the pronunciation of the word 'computer' was transcribed as [kompjúter], instead of the phonetic transcription [kəm'pjutə]. It was necessary to keep in mind that the trainees either had not learned English at all (in ten

cases), had only A1 level proficiency² (three participants), A2 (one participant) or, the highest level of English language proficiency among our trainees, B1 (intermediate - one participant). For some of the pronunciation varieties (British vs. American variant of English), we included both variants as a point of interest and for illustration purposes. We proceeded slowly, with enough time so that learners could record pronunciation or notes in the glossary if necessary. We described the words and phrases in layman's terms and gave an example of the specific context in which the term might occur, or we commented with analogies. Where necessary, we supported the concept/term being explained with an example from the internet. The term 'gamification', for example, was first explained and then demonstrated using the Duolingo application (we chose this particular application as it is related to foreign language learning). We continuously provided feedback by asking whether the trainees understood the term or had ever encountered it in their everyday life. In this part of the didactic process, a lively debate usually started with questions directed towards the lecturer most frequently: *'Why is this word not codified?', 'Why don't we have a Slovak equivalent for this term?', 'How does the process of vernacularisation of a foreign word in the Slovak language work?'*. The other phases of the didactic process (fixation, diagnostic, application) were not implemented in the first semester for time and strategic reasons.

In the second and final session of the course we focused on English terminology in everyday practical use of the internet, such as websites and social networks.

The motivational phase of the didactic process was very similar to the motivational phase in the first session of the training – welcoming the trainees, briefly warming the atmosphere by asking how everyone spent their summer holidays, and using the explained English concepts and terms from the previous lesson to ask about the practical life of the older adults concerned. We handed out some exercises to the participants to reinforce the previous themes we had explored.

² In indicating the level of proficiency in a foreign language, we have drawn on the Common European Framework of Reference for Languages (CEFR).

In the second semester the focus was put mainly on fixation and diagnostic phases – consolidating the knowledge of terms and concepts from the previous semester, but also, albeit to a lesser extent, explaining new terms.

We again projected on the screen all the concepts and terms from the previous lesson, and the lecturer read the terms again in both languages (English and Slovak) and clarified any discrepancies. After reviewing the material, the projection was turned off and the trainees were instructed to fill in an exercise using the terms we had learned. Each trainee completed the exercise on their own but had the opportunity to discuss the completed term with a fellow trainee. The completed terms were then checked and corrected if necessary. Subsequently, we divided the trainees into four working groups. Each working group received a Venn diagram. The lecturer explained its meaning and the procedure for filling in the terms in the diagram by projecting it on the screen. The trainees had a set time to complete the diagram, with the lecturer acting as the facilitator. After completing the Venn diagram, a representative from each working group read out the results, which we then were compared together.

After the first part of the fixation phase, we proceeded to the presentation of the new material – the most commonly used English terms and concepts from the web environment and social networks. Trainees received a new glossary with 25 terms. The lecturer followed the same approach to explaining the meanings and pronunciation as in the first semester. Explanations were occasionally, and as needed, supplemented with narration. After the exposition phase, we again proceeded to the fixation phase where we implemented the so-called five-leaf clover method with short exercises. We explained the functioning of the five-leaf clover method to the trainees with an example (we projected the word 'pioneer' on a screen). We distributed the didactic aid to each working group and invited them to fill in the five-leaf clover, within a set time limit. The word to focus on in this exercise was the word 'Facebook'. Afterwards, we compared the results; some of the most apt names were written on the board by the lecturer in the appropriate column.

In the last diagnostic phase of the didactic process we distributed questionnaires to the trainees, which they were asked to complete. This was followed by a short

conversation about the usefulness and applicability of the presented terms and concepts for the everyday, practical life of the trainees.

English terms are now an integral part of our everyday lives, not only in the lives of the younger generation (e.g., in computer games) but also in the lives of the older generation. Most often we can encounter them, for example, when ordering products and services on the internet, keeping in touch via social networks, instructions on household appliances, when communicating with various companies, and when filling in various forms.

It is not always an easy task to educate, at least on an informative level, the participants of the training – older adults. Various factors come into play, such as the difficulty of learning and remembering at a senior age, shyness, low motivation (some older adults come to courses solely to satisfy their need for socialisation), and other reasons.

The goal of the *University Enhancing the Smart Active Aging (UESAA)* project was to introduce the participants to the basic concepts of active ageing, welfare technologies and the practical everyday use of the internet, using the English terms when necessary and offering them Slovak equivalents (if any exist).

It should be noted that a much larger time allocation would be needed to properly teach the English terms (2 x 90 minutes is not sufficient). In our case, however, the aim of the given training programme - enriching the knowledge of older adults to enable them to partake of other technology-based practical courses – was realised and enabled the older adults to approach further learning experiences on courses such as ‘The Basics of Tablet/PC Work’, ‘Developing Innovations and Technologies in the Process of Active Ageing’, ‘Memory Training and Technique’, ‘Active Ageing’, or ‘Basic Setup and Configurations of Tablets/PCs’

CONCLUSION

This university textbook was created as a result of the collaboration of experts with a transdisciplinary focus across the fields of public health sciences, social work, education, psychology, linguistics and computer science. The team of authors provided a multidimensional view of the problem and its solutions in the form of basic theoretical starting points, examples of good practice in the field of creating educational programmes aimed at a targeted group of learners, and a specific content focus.

We have concluded that older adults are motivated to take part in educational courses. Our project has contributed to the knowledge that human-centred technology can assist older adults in using digital devices and engaging in digital communities. Based on feedback from older adults, we know that smart technologies can improve their quality of life by utilising their abilities and continuously expanding their knowledge. When developing smart technologies, ICT development professionals should take into account the opinions and preferences of older adults. National strategic plans can provide comprehensive instructional support for educators and promote the use of smart technology. Additionally, reducing the cost of smart technologies through EU projects or special sales offers for older adults can facilitate their use. Communication technologies can help reduce loneliness among older people and strengthen peer and intergenerational relationships within families and communities. Older adults are aware that virtual reality can be used for memory exercises and entertainment. In Slovak society, it is important to support the digital skills of older adults and enhance their agency and social and cultural capital through the use of smart technologies and skill expansion.

Smart technologies have the potential to promote cognitive and physical activity, improving the quality of life for older adults; however, more research is needed to determine the effectiveness and address the barriers to their adoption. The active use of digital technology by older adults can directly promote active and healthy ageing, benefiting both individuals and society as a whole.

To bridge the digital divide among older adults, lecturers and professional helpers, such as social workers and public health workers, should implement effective

strategies, such as creating supportive environments and enhancing personal perception.

Supportive environments may include giving better access to digital devices, improving internet connectivity, and providing training programmes tailored to the needs of older adults. Improving personal perception requires addressing older adults' attitudes, beliefs, and self-efficacy towards digital technology, and providing them with opportunities to build confidence and skills. By implementing these strategies, along with others, older adults can overcome the barriers to digital technology adoption and fully participate in the digital age, leading to an improved quality of life and greater social inclusion.

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University textbook

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