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Exploring the virtual world of learning across generations

Information and communications technology for the educational support of immigrant youth

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Introduction

The idea for this book came about as a result of the ICT Guides project, which was funded by the Erasmus+ programme.[1] The project was carried out in 2015–2018 in Gothenburg (Sweden), Berlin (Germany), Madrid (Spain) and Sheffield (United Kingdom). The cities identified for the project all have a relatively high percentage of young school students with immigrant backgrounds. This group of Europeans in particular are at risk of early school leaving, and are over-represented in terms of unemployment.

The book addresses the issue of information and communication technology (ICT) use in an educational environment, and presents research results from the ICT Guides project. In order to discuss how ICT can be used as a means to prevent early school leaving among immigrant youth, this book explores the literature on how learning can be understood in the intergenerational context (Chapter 1); what the challenges are in preventing early school leaving (Chapter 2), and the prospects for ICT in education (Chapter 3). Finally, we present the findings of an empirical study on intergenerational learning with the use of information and communications technology (Chapter 4).

As reports[2] on youth in Europe show, young immigrants are most at risk of social exclusion. Employment is a strong protective factor against the risk of poverty, and – as identified in the EU 2020 strategy – one of the most important targets for a smart, sustainable and inclusive Europe. Immigrant youths suffer from having an incomplete education, partly because of the economic crisis in Europe, and partly because of the military conflicts and strife in places such as Syria and Afghanistan.

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[1] Programme: Erasmus+; duration: 07/12/2015-31/08/2018; coordinator: SDFUTB – Sektor utbildning, SDF Västra Hisingen Göteborgs stad (Sweden); partners: Sheffield City Council (United Kingdom), DGI-CM – Dirección General De Inmigración, Comunidad De Madrid (Spain), SENBJF – Senatsverwaltung für Bildung, Jugend und Familie Berlin (Germany), University of Lodz (Poland). The project was funded with support from the European Commission, No. 2015-1-SE01-KA201-012232. This publication only reflects the views of the authors, and the European Commission cannot be held responsible for any use made of the information contained herein.

[2] Examples include Eurofound, NEETs – Young people not in employment, education and training: Characteristics, costs and policy responses in Europe, 2012; European Commission. Commission Staff Working Paper – Reducing early school leaving. Accompanying document to the Proposal for a Council Recommendation on policies to reduce early school leaving, 2010. European Commission 2020. A European strategy for smart, sustainable and inclusive growth. 2010.

Our findings highlight the fact that ICT-supported learning is a significant sociocultural platform for knowledge exchange, at the same time reducing intergenerational and cultural distance. It helps work toward the common good, creates a sense of belonging and ensures mutual support, and encourages better understanding and harmonious coexistence between young immigrants and older citizens. The function of ICT in intergenerational learning is changing, from serving as its catalyst to facilitating its participants' learning about each other.

With this book, we want to submit our activities and results for international assessment in the hope that the results of our experience will be helpful in the future implementation of similar projects.

The Authors

Chapter 1

Intergenerational learning in contemporary education – a theoretical justification of the ICT Guides project

Marcin Rojek

Introduction

Study of the subject of learning is a complex matter, mainly undertaken in the fields of psychology and pedagogy, but also various other sciences. For example, biology, neurology, medicine, sociology, cultural studies and economics. This multidisciplinary approach has caused an increase in the subject's complexity, which can be seen in the nearly innumerable number of original and overlapping, new and refurbished concepts and theories of learning, as well as in the focus on the study of learning in educational practice. Learning has ceased to be a process reserved for childhood and youth, and has begun to be consciously pursued by people throughout their lifetime, from early childhood to late old age. Similarly, the process has expanded spatially, that is, it has ceased to be identified only with school, and has become a characteristic of all human spaces, such as the home and workplace, in public spaces and online.

The purpose of this first chapter is not to provide critical analysis of theories or the construction of new ones, because there are many separate scientific works devoted to this. Instead, its main aim is to present the generally-accepted knowledge of the subject of learning, and based on that, build and present the concept of intergenerational learning as used in the ICT Guides project's assumptions, and in practical educational activities.

1.1. Learning in preference to education

The first attempts to analyze the practise of learning were made in a philosophical context as part of the study of knowledge, which was treated as a result of learning. In his Theaetetus dialogue, Plato argued that knowledge is true belief, or convictions justified by earlier experiences and reflections. Almost two thousand years later, the Cartesian concept of the mind as an autonomous individual and John Locke's concept of tabula rasa created opposition to the scientific thinking of the individual and society. Thus, a strict division was introduced between humans as individuals and humans as a collective (society). It was soon noted that a person's environment is the basis for formation of their qualities and means of survival. Therefore, the need also arose to create synergies between people and their environment. The answer to this need was the

phenomenon of learning. Learning appeared as an integrational mechanism, which explains how individuals behave, what regulates their behaviour and how it does so.

Nowadays, learning is an interdisciplinary field and the subject of intense and ever-growing interest from researchers in various sciences and fields of knowledge. It is also highly appreciated by practitioners in formal and informal education, such as teachers, educators and social workers. This increase in research interests and the social importance of learning was noted in the middle of the last century by American psychologist, outstanding researcher and expert on the subject of learning, Ernest Hilgard, who explained this situation in the following way:

> The scientific study of learning is carried on primarily by psychologists. Psychology's claim to the field was staked in part by masterly pioneers such as Ebbinghaus (1885), Bryan and Harter (1897, 1899) and Thorndike (1898). Those who have followed in their footsteps have been primarily psychologists. Professional educators have been welcomed educational psychology as a foundation science upon which to build their practices, and studies of learning have gone on concurrently in laboratories of general psychology and laboratories of educational psychology, which interplay between pure and applied fields. Under the circumstances, it is very natural for psychologists to feel that the study of learning belongs to them.
> In addition to historical reasons, there is another basis on which to account for psychologist's interest in learning. This is centrality of learning in the more general systems of psychological theory. A scientific, along which the desire to satisfy his curiosity about the facts of nature, has a predilection for ordering his facts into systems of lows and theories. He is interested not only in verified facts and relationships, but in and parsimonious ways of summarizing these facts. Psychologists with a penchant for systems find a theory of learning essential because so much of man's diverse behaviour is the result of learning. If the rich diversity of behaviour is to be understood in accordance with a few principles, it is evident that some of these principles will have to do with the way which learning comes about (Hilgard 1956: 1).

The role of learning has always been greatly appreciated, but it is only modern man who has begun to realize that one can learn not only at school, but also (and perhaps above all), outside school, thus becoming a being that accomplishes by acquiring knowledge. Furthermore, the conviction that learning does not end with the completion of a formal (school) education is burrowing deeper and deeper into the social consciousness. Learning lasts a lifetime, is a necessary condition for adults to keep pace with rapid technological, social and cultural changes, and above all, to cope with social and economic demands. Of these latter, the most important include competitiveness on the labour market, entrepreneurialism, the ability to operate on the free market in an atmosphere of uncertainty, and a readiness to change jobs or professions. Thus, the phenomenon of learning is now characteristic not only of a person's school days, but also throughout their life. The learning renaissance, both during and beyond school, has already begun. It is a process aimed at making huge qualitative changes in education, and is a difficult and irreversible process. We are now standing in the twilight of the primacy of teaching over learning (at least, outside of school), due to the low effectiveness of 'teaching' compared to the enormous potential of 'learning'.

Peter Jarvis (2006: 13–17), a prominent researcher and expert on learning, argues that it occurs through stimulation of human senses by their external environment, both natural and physical, social and cultural. This contributes to the integration of the individual with the world. Over the centuries, a different understanding of learning has appeared that generally fits two perspectives: the psychological and pedagogical.

From the psychological perspective, learning is the emergence of a relatively permanent change in the behaviour of individuals (behaviourism), or assimilation of messages indicating the process and adaptive nature of learning (the cognitive approach). From a psychological point of view, even if learning occurs in relation to one's surroundings, and so has the character of an internal mental process in the mind of the individual learner, it still results in behavioural changes or acquisition of new knowledge, skills and habits. The pedagogical perspective points to the more humanist nature of learning and its relationship with school. In this perspective, learning is associated with a specific type of attitude to knowledge and to life, which requires personal commitment and initiative. Pedagogical learning is the more powerful figure in comparison to its original, psychological counterpart. It is frequently planned with the intention of achieving a particular purpose, for example, solving contemporary educational issues such as behavioural problems, lack of motivation for learning, a lack of desire for self-improvement, prevention of addictions and early school-leaving. This kind of learning is accompanied by the use of various symbolic systems, including language, concepts and theories.

Learning is not the only activity undertaken deliberately to assimilate knowledge or acquire skills. According to the world's leading educational researchers, learning is a mechanism of general human development, a kind of continuous response to events in order to achieve a sense of control over life (Biesta et al. 2010: 6). Today, there are many epithets, definitions and concepts of learning. In the intention of its creators, each new theory or concept of learning is designed to overcome the limitations of the previous theories. Two British learning researchers – Sarah-Jayne Blakemore and Uta Frith – postulate that the multiplicity of the concept of learning and great interest in the research on it, should lead to the establishment of a new interdisciplinary science dedicated to learning, drawing on the achievements of neurophysiology, psychology and pedagogy. In their view, it must also take into account the fact that learning lasts a lifetime (Blakemore, Frith 2008: 190).

The first step towards solving our research questions is to present the current understanding of intergenerational learning, as it was applied in the ICT Guides project. The human being is thus an individual fulfilling themselves through the acquisition of knowledge. In contemporary culture and society 'a learning renaissance' is clearly visible. This applies to the learning of youths, adults and seniors, as well as to formal and informal learning. It is a process aimed at making a huge qualitative change in education for certain people and institutions (e.g. schools), and for some it will be difficult, but

once started is irreversible. Nowadays, we can see the signs of the end of the supremacy of teaching over learning, because of the low effectiveness of teaching compared to the high potential of learning. In contemporary considerations about education, emphasis is placed on the fact that people should learn from each situation that occurs in their life, and draw conclusions from it for application in the future. This is because 'human life – development – learning' forms a distinctive ontological-anthropological triad determining humanity. Learning is therefore more important to becoming, rather than being a human. The worth of a person is thus defined by their learning. To paraphrase the famous quote, you could say 'I learn, therefore I am'. To undertake research on the practise of learning it is essential to familiarize oneself with the different points of view on the process. Analysis of the scientific literature shows that the term 'learning' has become fashionable and is being increasingly used. A multitude of kinds of learning have appeared, with a multitude of definitions of learning and types of learning. These include learning from biography (one's own and others); life-long learning; general learning (vs. partial learning); learning by work; incidental learning; learning by tests and mistakes; involuntary learning; learning by imitation; unintentional and intentional learning; learning by uncovering; observational learning; learning from memory; cognitive learning; learning by relations; learning to learn oneself; learning by strategy; planned learning; organized learning; self-learning; associative learning; conditional learning; learning by rule; 'all or nothing' learning; series learning; selective learning; subliminal learning; intergenerational learning, and many more. Some of these are only presented as intuitive and colloquially understood slogans, while others seem to form a prospective field of inter-disciplinary research. It is quite difficult to obtain an overview of the current understanding of the topic of learning while sticking to only one perspective. According to various authors, the learning process can be understood as:

- A process of reacting to external stimuli and responses (Edward Thorndike, Ivan Pavlov, John Watson, B. F. Skinner, Edward Tolman).
- Cognitive development based on the computational process of acquiring and storing data (Kurt Lewin, Jean Piaget, Kurt Koffka, Wolfgang Kohler).
- Acquire a way of representing 'recurrent regularities' in their environment effecting the concepts, categories and problem-solving procedures invented previously by national culture, as well as the ability to 'invent' these things for oneself (Jerome Bruner).
- Controlling, modelling and imitating others (Albert Bandura).
- Interaction between the learner and the environment, in order to acquire mind tools (Lev Vygotskij, Aleksei Leontiev, Aleksander Luria, Max Wertheimer, Wolfgang Köhler, Theodor Adorno).
- Transforming external mental structures into internal structures that allow the expression of beliefs and opinions (Jack Mezirow, Paulo Freire Jürgen

Habermas, John M. Dirkx, Robert D. Boyd, J. Gordon Myers, Rosemary R. Ruether).
- Interaction between cognitive, emotional and social processes (functionality, sensitivity and integration) effecting the acquisition of knowledge, skills and competences (Knud Illeris).

The above are just a few examples of what learning is. But they are enough to prove that the scope of our understanding of this process is quite broad. Taken together, all of these perspectives cover a wide range of:
- Types of learning (acquiring information, skills, habits, developing abilities and attitudes).
- Forms of learning (learning by trial and mistake, by imitation, discovering and activities).
- Learning conditions (age, environment, motives, stimuli, abilities).
- Learning results (increase in knowledge and skills, development of abilities and attitudes.
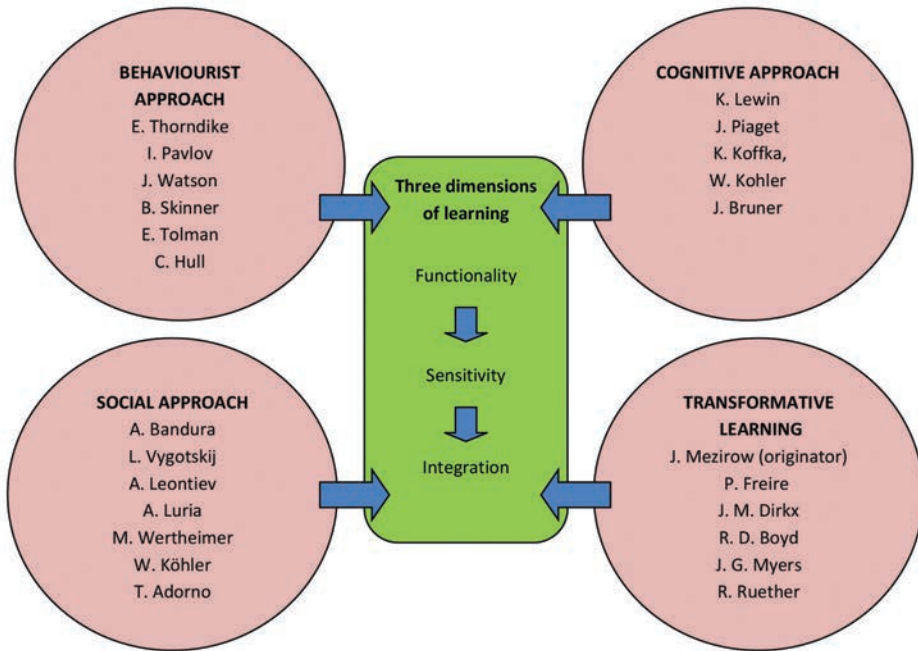
Figure 1. The main theoretical perspectives of learning
Source: original study

- Knowledge transfer – the consequences of learning information and skills and passing them on to others.

At the same time there is no one general, universal or most representative theory of learning. The modern understanding of learning is a conglomeration of theses from various theories, which can be conventionally included in the five

theoretical perspectives of/ approaches to learning given above. In the following subchapters, they will be characterized more closely.

1.1.1. The behaviourist approach to learning

The behaviourist view of learning was developed by Edward Thorndike (1911, 1931), who presented a theory of learning that incorporated the consequences of behaviour in the form of how the behaviour was reinforced. Thorndike then developed his 'law of effect', which stated that behaviours that are rewarded tended to recur, while behaviours that are punished or not rewarded tended to weaken the character. Later, Thorndike (1931) refined his law of effect to reflect the fact that he found that punishment did not weaken the stimulus-response connection, but rather led subjects to avoid the situation, or initiated feelings of anxiety or fear. The significance of this to the study of learning was summarised by Thorndike himself as "we may increase our confidence in positive rather than negative learning and teaching" (Thorndike 1931: 46).

Nowadays, behaviourism is perceived as a scientific approach, shaped on the basis of psychology and first appearing in the United States at the beginning of the 20th century. The leading representatives of behaviourism are Edward Thorndike (1874–1949), Ivan Pavlov (1849–1936), B. F. Skinner (1904–1990), John Watson (1878–1958), and Clark Hull (1884–1952). They sought to develop a theory of the preservation of organisms without considering what might be happening in their minds, which they considered unscientific. Instead, the behaviourists, aiming to explain human behaviour, made learning the central concept. Following Darling's idea that man is a continuation of animals, they assumed that the way in which both people and animals learn is similar, and involves experiences gleaned from the environment. To further examine this theory, they used strict research methods culled from the natural sciences. The result was the statistical recognition of the relationship between objectively measurable stimuli and the reactions they trigger. Pavlov and other behaviourists then used the same research methods in their own scientific work. The result was, amongst other things, the theory of conditioned reflexes, also known as the physiology of higher nervous functions. They assumed that learning takes place in the neural system. If learning causes a change in the behaviour of the individual, the reason is a change in the way their neurons (the most important cells in the human nervous system) are communicating. From a biological point of view, learning is the creation of new connections between nerve cells in the brain, or the stimulation of these connections. However, knowing what is happening between neurons is of little help if it is not embedded in a broader context, as it does not create a broader picture and as such is not subjectable to interpretation. Taking the neural theory of learning as a basis behaviourists have developed two main theories of how information from the environment is processed, explaining the relationship with changes in the behavioural potential of the individual. These two theories also constitute two methods of research on

learning. These are classical conditioning and instrumental conditioning. In classical conditioning (conceived by Pavlov), reinforcement (unconditional stimulus) is applied regardless of whether the subject reacted. Classical conditioning as learning (or a method of research on learning) consists in the production of temporal relationships (conditioned reflexes), by combining factors for neutral individuals, i.e. they do not elicit any reaction with non-indifferent factors, or evoke a specific reaction. Inert factors are usually congenital reactions (at a species level), or are acquired reactions and are strongly fixed as a result of previous experiments. The combination of neutral and non-neutral factors means that neutral factors become indifferent to the body and trigger a specific reaction. Pavlov famously proved this in (amongst other things), his research on animals. As a result of multiple repetitions of a situation consisting in the emission of a light signal (an inert agent) before feeding a dog its food (an indifferent factor that causes salivation), the thus-far neutral factor became non-neutral, i.e. the emission of the light signal itself caused the dog to secrete saliva. At present, any stimulus-reaction reaction is considered to be classical conditioning. It is also known that unconditional reflexes occur at the level of the spinal cord, and conditional reflexes require the participation of the brain and consciousness in order to coordinate muscle movements, which is the essence of instrumental conditioning. This means that a person creates the direct animal-type connections between sensually-perceived situations and their responses to them as a result of multiple repetitions, or pleasant consequences. These connections (associations) arise as a result of Thorndike's three laws: the law of exercise (law of exercise), the law of association (law of associative shifting), and the law of effect (law of effect). The law of exercise consists in repeatedly inducing connections between stimulus and reaction, which strengthens the relationship between them. The law of associative shifting states that if one of the two stimuli triggers a motor reaction and the other does not, then the second will also trigger it. However, the law of effect consists in the elimination of activities that do not lead to the goal, or so-called error testing. The pleasure of effective trials strengthens the relationship between the action and its effect, while the negative effect of the errors weakens the relationship between the goal and the action. This applies to both animals and people. The difference in the learning of people and animals is that man has the additional ability to acquire a huge set of ideas, to think about what happened and in what he has participated. He can analyze, reason and apply. This is all thanks to the enormous number of neural connections and cells in the brain – an incomparably larger amount than in animals.

Thus, the biological (quantitative) change in the number of nerve connections and cells causes a qualitative change in the form of, among others, abstract thinking. In this way, the source of human experience is not only the external environment, but also the thoughts and reflections resulting from being a member of society and participating in culture. Thorndike's view that reward or reinforcement is a learning attitude shared by the third of the main representatives of behaviourism – Burrhus Frederic Skinner. His research confirmed that

a person tends to learn a given reaction if it is strengthened afterwards (reward). In Skinner's concept, however, strengthening is treated as being more neutral than the reward, because with previous experience, the same reinforcement can at once be subjectively perceived as a reward, and at other times indifferently. Skinner distinguished two types of activities in the learning process: reactive reactions and efficient reactions. Reactive reactions are based on Pavlov's theory of classical conditioning and rely on the formation of connections between stimuli. According to this assumption, learning is a reaction to environmental stimuli. Skinner was of the opinion that such learning occurs in man, but learning by conducting conditioning happens much more frequently. Causal conditioning as a learning process is an increase in the likelihood of a reaction occurring as a result of its direct reinforcement. The person first performs a reaction and then suffers its consequences in the form of stimuli. An example of this is the behaviour of children in the classroom. The teacher's reaction to their previous behaviour is her smile. Over time, behaviours that cause a smile are more common than others.

This approach rarely occurs in a field of formal education in a 'pure' form, but behavioural thinking about teaching has taken over teachers' minds and pupils' learning. The dominance of behavioural learning manifests itself in program teaching, the use of teaching machines (computers), the use of simulations and fitness exercises, and in the precise determination of what students are supposed to learn. The role of the teacher is to guide and control students' learning, providing direct feedback and strengthening the desired student behaviour. Contemporary criticism of the behavioural approach to learning consists in questioning the possibilities of complementary descriptions of learning solely through stimuli, reactions and reinforcements. Behaviourism also does not take into account the variables that mediate learning that are inherent in the social environment and culture. It is a psychological direction, the representatives of which were aware of the difficulty of finding a methodologically correct way of defining mental phenomena. Ultimately though, behaviourism bypassed this problem more than it solved it.

1.1.2. Cognitive learning

The cognitive approach to learning is associated with the development of cognitive psychology, in which the learning ideal is the constant and continuous cognitive activity of the learner. Cognitive psychology deals with the processes of acquisition, processing and use of information, and the mechanisms for creating internal representations and operations performed on them. Great contributions to the understanding of cognitive processes were made by representatives of British empiricism George Berkeley, David Hume and John Stuart, and later, Noam Chomsky, who challenged the behaviourist thesis that language is only the result of learning. Karl Spencer Lashley was the first to assert the

need for psychologists to go beyond behaviourism. Lashley was a former student of John Watson, co-creator of behaviourism, and opposed the behaviourist understanding of the brain as a passive organ reacting to external stimuli. He believed that the brain is an active organ dynamically planning human actions. The cognitive stream is the last great note of psychological thought, within which reflections on learning were made and research was carried out in this area. It is not completely uniform, and does contain different views. Nevertheless, there are also common elements.

Cognitive psychology was born from (amongst other things), criticism of behaviourism, which makes the following assumptions about people and the world around them:
- People are independent subjects, active in their environment, and give meaning to the signals coming to them from the environment.
- People react reflexively and not automatically.
- People processes data from the environment to control its behaviour.

The central concepts in cognitive psychology include cognition, perception, thinking, attention, memory, representation and concepts. In the context of learning, memory deserves special attention because it is the basis for acquiring knowledge and learning. Memory is created structurally or procedurally. In structural terms, memory (also known as warehouse memory, multi-warehouse or block memory) consists of several 'depots' differing in structure and functioning. The two principal warehouses are for the short-term memory and long-term memory. A characteristic feature of the concept is that some of the data from the environment will never reach long-term memory storage, because it will be diverted to the short-term memory stores or lost during the transition process between warehouses – hence the phenomenon of forgetting. In contrast, the processual approach is a response to the criticism of the structural approach, and states that memory can not be divided into separate 'warehouses' because it is the process of information processing by the human cognitive system. This process is based on the fact that information can be handled at various depths, from shallow superficial sensory analysis to the deepest semantic levels. Memories remain as a by-product of this processing, and their strength depends on the depth of their processing. If a memory is limited to the sensory level, it will be weak, and if the information is understood and 'sinks in', a much stronger memory will be created.

Both types of memory are important in learning. Their importance depends primarily on the purpose of the learning. Measurably better learning outcomes are achieved when the way information is processed during memorization meets the learners' needs and abilities. Thus, the relationship between memory and learning, and the results, is clear.

Psychologists representing the cognitive approach treat learning as an active, goal-oriented process. Learning in this sense is constructive and cumulative – the learner does not acquire knowledge from outside, no one 'puts it' into their head, but they build it themselves in their mind or reorganize knowledge

already stored in the light of new data. Learning therefore leads not to an increase of knowledge (quantitative changes), but above all to qualitative changes – the reorganization of cognitive structures, the emergence of new structures, the collapse of earlier ones. Learning includes actions that modify knowledge stored in the mind, incorporate new information from existing structures, or change structures when new information requires it. Learning is also about acquiring the readiness to process specific types of information: about objects, phenomena, processes and values. Information understood as a reduction of uncertainty about a situation is the main concept of cognitive psychology, and finds form in a wide variety of computing analogies and metaphors. Learning is not a cognitive activity that takes place in a vacuum, on the level of pure cognition, but in a particular person with their own unique traits (e.g. their age and current level of development).

However, this regularity is not a universally applicable law, because it sometimes happens – and this is a more complicated situation – that new information conflicts with stored knowledge that has already been strongly established, and derived from everyday experiences and observations. When that happens, the understanding of learning as gathering information and data to enrich knowledge, must be replaced with an understanding of learning as a conceptual change, that is, the reconstruction of existing knowledge. But the phenomenon of conceptual change does not have to be understood literally, that is, as replacing one concept with another, or changing the understanding of a given concept, or replacing erroneous beliefs and views with certain scientifically proven views. In fact, from the point of view of building a coherent knowledge system, conceptual change is best understood as the development of various points of view, leading to the creation of a more general, abstract perspective. In cognitive learning, it is personal understanding and independent construction of knowledge that is most important, while the acquisition of knowledge from other people is of little value.

The notion of 'learning' in cognitive terms includes 'information', 'knowledge' and 'wisdom'. In practice, there is a real danger of identifying information with knowledge. Information is just a material for building knowledge, but the act of collecting information does not itself build knowledge. Knowledge is not accumulated in disarray – even from huge amounts of information – but only through ordered collection. Knowledge is objective, but it is not absolutist because it changes with scientific discovery. In addition, every human being constructs their own knowledge system from information, not only on the basis of scientific information, but also from their own past and current experiences in everyday life. Even such an ordered and extensive knowledge system is not wisdom. Wisdom from the point of view of cognitive psychology is the sum of individual experience, which allows the knowledge to be used in various situations to help people cope.

Important conclusions can be reached for school education from the cognitive approach to learning, which is largely based on students' memorisation of content provided by the teacher or textbooks. The first is that content that evokes students' interest is remembered more quickly, saved more securely in

their memory, and retrieved faster when they need it. This principle is part of – amongst other approaches – the problem-based teaching method.

The second conclusion is that information and skills that are important to the individual and that are needed in life, are permanently stored. This can be seen in the teaching and learning of adults and adult students; one of the features of adulthood is making life plans. Adults learn the information and skills they need to implement their life plans, and see the possibility of their use based on previous experience.

The third main conclusion that can be drawn from the cognitive approach to learning is that such lessons are better remembered, longer-lasting, and easier to extract from the learner's memory of the understood content. Understanding is facilitated by the combination of what the learner knows, what they know they need to learn, what they can see and hear, and what they can imagine or read, then imposing their own understanding on all this – not just by passively accepting the understanding of others. Learning in this sense is not synonymous with acquiring knowledge or knowing things. In cognitive terms, learning is a means of acquiring knowledge, not the acquisition of knowledge itself. It consists in comparing acquired knowledge to knowledge already possessed, organizing it into larger memory structures then ordering it in the form of abstract principles. When knowledge acquired in this way is stored, some of it is forgotten too, and then recalled with prompting, hints or context.

Research conducted by cognitive psychologists on the process of acquiring knowledge, memorizing and learning, has led to the development of methods supporting these processes, which are known as mnemonics, or 'the art of memory'. Taking into account the characteristics of people's cognitive processes, mnemonics aid memory by making use of more than one representation code in the process of acquiring a specific piece of information. It does this by assigning alternate forms of representation to the information, or by organizing and structuring previously-unstructured information. The most popular mnemonics are: the so-called interactive image method; categorizing; the word-hangers system; the place method, and cognitive maps. Experiments testing the effectiveness of mnemonics show that they do increase the effectiveness of memorisation of information from reading by about 10–15%.

The cognitive approach to learning described here has a psychological genesis, and is based on the definable psychic rules of the functioning of the mind. It is described in the literature as a language proper to psychology and referring to purely psychological (cognitive) processes. This does not mean, however, that the cognitive approach is not used in pedagogical practice. Cognitive learning is correlated with teaching, which is understood as the process of organizing learning, is related to Jean Piaget's theory of cognitive development, and is used in teaching and the planning of students' learning by teachers.

1.1.3. Social learning

Social learning theory is sometimes considered a bridge between the behaviourist and cognitive learning theories, because it encompasses attention, memory, motivation and social participation.

The behavioural approach in psychology became a dominant force in the first half of the 20th-century, and had a strong impression on people's perception of the learning process. Behavioural theories of learning suggested that learning outcomes were the result of associations formed by conditioning, reinforcement and punishment. In contrast, social learning theory proposed something new – that learning can also occur simply by observing the actions of others. From the behavioural point of view, all learning is the result of direct experience from the environment by a processes of association and reinforcement, while direct reinforcement can not account for all types of learning. According to the social approach to learning, people can learn new information, behaviours and competences by watching other people and participating in society and culture. As such, social learning is commonly known as 'observational learning' (although this name is misleading and has not found widespread acceptance in science). Social learning can be used to explain a wide variety of behaviours, including those that often cannot be accounted for by other learning theories.

The social approach to learning says that people learn from one another by observation, imitation, and modelling. It is often considered a bridge between behaviourism and cognitive learning theories, as it encompasses attention, memory, and motivation. People learn by observing others' behaviour and the outcome of those behaviours. Social learning theories focus on the learning that occurs within a social context. Amongst others, Albert Bandura is considered a leading proponent of the social approach. His general principles of social learning theory are that:

- people can learn by observing the behaviour of others and the outcomes of those behaviours;
- learning can occur without a change in behaviour, but with changes in thinking;
- social and cultural cognition plays an important role;
- in recent years, learning theory has become increasingly cognitive in its interpretation of human learning, and that awareness and expectations of future reinforcements or punishments can have a significant effect on the behaviours that people exhibit;
- social learning theory can be considered a bridge or a transition between behaviourist learning theories and cognitive learning theories.

The social learning approach arose as a response to the weakness of behaviourism, which couldn't explain everything that it observed. Behaviour and environment affect each other reciprocally, and social learning braids the learner's personality with their behaviour and environment. After defining this relationship, the philosophy of behaviourism turned more toward the cognitive.

The beginning of cognitive theory then lead to expanded research on language acquisition, learning, and self-regulation.

Social learning explains human behaviour in terms of continuous reciprocal interaction between cognitive, behavioural, and environmental influences. In essence, learning always occurs in a social context and cannot be separated from it. Consequently, instructional strategies that promote the distribution of expert knowledge – in which students work together to conduct research, share their results, and perform or produce a final project – help to create a collaborative community of learners. This is especially visible in the case of intergenerational learning. Knowledge construction occurs

> Within a social context that involves participants' collaboration on their real world problems and interests that builds on each person's language, skills and experience, as shaped by each individual's culture (Vygotsky 1978: 102).

A. Bandura recognizes the direct experiences that result from the behaviour of the individual as the most elementary means of learning. These experiences can be positive or negative. Behaviours that people experience as positive persist, while those with negative experiences are weakened. Experiences, understood as the consequences of their own reactions, fulfil three functions: they convey information, motivate and have the ability to automatically reinforce the reaction.

The information function consists in observing the various results of one's own actions and formulating hypotheses about which behaviours are the most appropriate in a given place and time. Reasonable hypotheses are those that trigger effective actions, and erroneous hypotheses lead to ineffective actions. Information obtained in this way is used to plan future activities. In contrast to the behavioural approach, in which the modification of the behaviour of the individual is mechanistic (physiological), in the social theory of learning changes in the behaviour of the individual are made through the process of thinking. In this approach, information is considered a cognitive process and obtaining it causes slight changes in the behaviour of the individual. If, on the basis of other sources of information, people do not think that a behaviour will be rewarded in the future, then the probability of their behaving in that way will not increase.

Motivation is the second function of the consequences of human activity. Its basis is the human ability to predict events. If a person predicts that in the future their conditioned behaviour will have specific benefits, they will repeat that behaviour. What's more, people are able to modify their behaviour to bring predictable benefits.

The above-described learning from one's own reactions is characterized by the prevalence of its occurrence, but it is not the only thing modifying human behaviour. A second source of modification is – according to A. Bandura – learning by modelling (observation). Learning by modelling is not about the effects of one's own actions (as with learning from one's own reactions), but observing

other people. It is about making an opinion on how to perform new behaviours, which then becomes a source of guidance for further action. In this sense, learning by modelling is primarily an information function.

Social learning shows the multi-aspect and dynamic connections between individual factors, behaviours and environmental (social) stimuli. These connections are the key mechanism of human functioning, and learning. In this researcher's view, learning does not consist in automatic changes in behaviour as a result of artificially created stimuli acting on the individual. Learning is a continuous and complicated process of interaction between personality and environmental factors.

Figure 2. Components of the social theory of learning: an initial inventory
Source: Wengler 2010: 211

In social learning, the components necessary to characterize social practice as a process of learning and of knowing are integrated (Wengler 2010: 211), and are as follows:
- *meaning* – talking about peoples' changing ability in individual and collective dimensions to see their life and the world as meaningful;
- *practice* – talking about common historical, cultural and social resources;
- *community* – talking about the social and cultural configurations in which peoples' enterprises are perceived as worth pursuing;
- *identity* – talking about how learning impacts people, who they are, their personal and social histories and wider community context.

In this sense, learning is not an activity separated from the historical, social and cultural environment and circumstances. Instead, it is based on attention, which means that various factors increase or decrease the amount of attention paid. These include distinctiveness, affective valence, prevalence, complexity, and functional value. Remembering helps people pay attention to symbolic coding, mental images, cognitive organization and symbolic rehearsal, but it cannot

be done without motivation – having a good reason to imitate. This includes motives such as the past (behaviourism), the promised (imagined incentives) and the vicarious (seeing and recalling the reinforced model).

As a result, instructional strategies that promote literacy across the curriculum play a significant role in knowledge construction, as well as the combination of whole class leadership, individual and group coaching, and independent learning. Moreover, teachers need to provide the opportunity to students for a managed discussion about their learning. Discussion that has a purpose, consists of substantive comments that build off each other and meaningful exchange between students, will result in questions being asked that promote deeper understanding. A discussion-based classroom using Socratic dialogue, in which the instructor manages the discourse, can lead each student to feel like their contributions are being valued, and this results in increased student motivation.

The teacher, or local expert, plays the important role of facilitator, creating the environment in which directed and guided interactions can occur. Many other educational theorists have adopted Vygotsky's social process ideas and have proposed strategies that foster deeper knowledge construction, facilitate Socratic student discussions, and build active learning communities through small group-based instruction.

Social learning theories explain how people learn in social contexts (from each other), and show how active learning communities are constructed. Learning takes place through the interactions students have with their peers, teachers, and other experts. Consequently, teachers can create a learning environment that maximizes the learner's ability to interact with each other through discussion, collaboration, and feedback. Moreover, social learning argues that culture is the primary determining factor in knowledge construction. People learn through this cultural lens by interacting with others and following the rules, skills, and abilities shaped by their culture.

1.1.4. The transformative approach to learning

A transformative approach to learning was introduced in 1978 by Jack Mezirow, professor of adult education at Teacher College, Columbia University. Mezirow had been an adult education consultant for many years in various developing countries, inspired by the Brazilian Paulo Freire and German Jürgen Habermas. At the same time, as part of his work with women's adult education in the States, he defined a wide-ranging form of education that reaches into identity changes. Mezirow then elaborated his theory of transformative learning, presenting it in 1978 in an article entitled *Prospective Transformation*, published in the "American Adult Education Quarterly" journal.

The concept of transformative learning serves the humanistic development of all learners, thereby realizing the liberating functions of education. The emergence of this concept changed the idea of adult education. Previously, adult

education and adult learning had not been treated as complementary processes, but the opposite. They were a kind of progressive enslavement, involving the preparation of adults for specific social, professional and family roles. As such, they did help with adapting to a permanently changing world, requirements and living conditions. Adult education and adult learning were also based on the a priori assumption that the attributes of an adult person include active participation in a social and cultural life, to which it seemed there was no alternative. The exemplification of this understanding of adult learning is – amongst other things – an institutionally-recognized emphasis on the importance of learning specific messages, skills and habits for use in work, family, socio-cultural and political life, or for one's own satisfaction. The learner is subject to an orderly educational influence, which in a conscious way helps them acquire the relevant knowledge, skills and habits.

The transformative learning process leads to deep changes in the way people perceive and interpret both themselves and the world, and changes the reality that surrounds them (Mezirow 1991: XVI–XVII). The essence of this theory of learning is transformation in an individual reference frame[1] of references, leading to the liberation of people interpreting their experience as fixed, dysfunctional patterns of meaning. Transformation is a kind of epistemological revolution in the individual development of people trying to reach the truth about themselves and the world that they're shaping, and increasing the range of their own independence in thinking and acting. This process involves changing the way in which people give meaning to their experience; on separating what they accept uncritically from others, or use habitually and self-support through conscious, critical reflection. The central point is that people gain experience constantly, by being in touch with reality and the process of its interpretation. This process is crucial to human existence and operation, because people's interpretation of the world has a strong impact on their actions and hopes, their satisfaction with life and the effectiveness of their actions (Mezirow 1991: XIII). The process of interpreting individual experiences, like raw data flowing from the outside or from the inner world of the individual, consists in giving them meaning (Mezirow 1991: 34). This means production in the individual consciousness of the human symbolic representation. being a reflection of the perceived world. The process of

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[1] A "frame of reference", initially called "perspective of meaning" by J. Mezirow ('meaning perspective'), is a structure built of assumptions and expectations through which we filter sensual impressions. It includes cognitive, emotional and motivational dimensions. It selectively shapes and defines people's perception, cognition, feelings and motivation by creating certain predispositions about their intentions, expectations and goals. A frame of reference provides context for broadcasting meaning, in which people choose sensory experience, which is interpreted, as well as the manner in which it is interpreted and/or used (Mezirow 2000: 16). The frame of reference compacts the whole, composed of previously-created associations, concepts, values, emotions, conditioned reactions; it shapes the perception, cognition and feeling, it also sets the direction of our activities. It is, therefore, shaped during daily life, in consciousness it is the construction that defines the way we interpret our world and experiences. It affects thinking, experiencing and acting. A frame of reference is a structure constructed from accepted assumptions (premises), and expectations (aesthetic, sociolinguistic, moral-ethical, epistemic, psychological), through which they filter and give meaning to our world.

giving meaning to our experience involves our perception, thinking and memory (Mezirow 1991: 4). This process consists of two interactive processes: scanning – the perceptual, pre-cultural mapping of perceived objects, (the source of cognition is in this case the senses), and reasoning – using a specific language code and conceptual model of reality as perceived by the senses. These two processes of constructing meaning are involved in two dimensions of consciousness, the representational and the propositional. In the consciousness, an image of what is perceived is created, and a specific thought or opinion is made about it (Mezirow 1991; 2000). Mezirow, referencing the views of Jerome Bruner, is of the opinion that in human development there are four ways to give meaning: intersubjectivity, action, normativity and the propositional (Mezirow 2000: 4).

Adult learning understood and organized in this way and sense was a barrier to multidimensional and full development. Development is here, adaptation to the external requirements of the individual of the world, which is always limited – physically or symbolically. In this light, transformative learning can be an interesting alternative to adult education and learning. In this approach, the framework of learning is culture and language, which construct our understanding through the coherent attributes of our experience. According to Mezirow:

> transformative learning is defined as the process by which we transform problematic frames of references (mind-sets, habits of mind, meaning perspectives) – sets of assumption and expectation – to make them more inclusive, discriminating, open, reflective and emotionally able to change. Such frames are better because they are more likely to generate beliefs and opinions that will prove more true or justified to guide action (Mezirow 2010: 92).

To participate fully in educational discourse, adults should:
- have appropriate and complete information;
- be free of external/internal constraints and demobilizing requirements;
- be open to alternative points of view – be empathic and able to take into account other people's thoughts and feelings;
- be able to understand and take into account the importance of objective assumptions and arguments;
- take into account the context of – and make critical reflections on – their own and other people's assumptions;
- have an equal opportunity to participate in various roles in educational discourse;
- be able to check the credibility of new perspectives, comparing arguments for a better understanding (Mezirow 2010: 92).

Various features of the human mind allow us to categorize experiences, beliefs, other people, events and ourselves. Psychological structures, social rules, criteria, codes, patterns, standards in culture and society, values and opportunities, as well as individual language, feelings and patterns of action are all involved in this categorization process, and this perspective on understanding the process of learning has the following dimensions:

- *sociolinguistic* – consisting of cultural canon, social norms, customs, ideologies, paradigms, language structures, political views and secondary socialization (thinking appropriate to a teacher, doctor, policeman, etc);
- *moral-ethical* – conscience, moral norms and values;
- *learning styles* – preferred learning methods, focus on the whole or individual parts, individual learning or in groups;
- *religious* – commitment to doctrine, spiritual and transcendental world views;
- *psychological* – theories, patterns, beliefs about one's self, personality traits, personality types, dispositions, prohibitions;
- *health* – ways of interpreting health problems, rehabilitation, experiencing death;
- *aesthetic* – values, a sense of beauty, a sense of 'taste', standards, criteria of beauty and ways of expressing it, reactions to beauty, ugliness, tragedy, humour and boredom (Mezirow 2010: 93).

With reference to Jürgen Habermas's views, Jack Mezirow distinguishes three types of leaning: instrumental, communication and emancipation.

Instrumental learning is based on technical interest and is associated with the work, production and technical organization of a person's social life. The result of this learning is descriptive knowledge – impersonal, formal, not affecting personal development but objectified, which can be perceived as its main asset. It includes understanding of the complexity of technical tools needed to operate in the world.

Communication learning is based on the assumption that communication, i.e. symbolic interaction, is an indispensable condition for experiencing life, defining the position it occupies, our orientation in the patterns that other people move in within it, and in the expectations we formulate of people. In this universe of social interactions, people constantly encounter information, predictions, explanations, arguments and claims. In deciding what is good and what is bad, correct and incorrect, justifiable and wrong, appealing and unappealing, people draw on social norms established in the way of evaluating consensus, and that is permanently present in social interactions. This kind of learning is based on metaphor, which captures what cannot be directly articulated. Through insight into the content of metaphors and critical reflection upon them, a person learns to understand themselves and their surrounding reality. This changes their currently-employed patterns of meaning, and enters the area of other meaning perspectives, and this widens the limits of intersubjectivity.

The third type of learning is emancipation learning. In this case, the main means of learning is critical reflection. This consists in freeing ourselves from the linguistic, epistemological, institutional and environmental forces that limit our rational control over our own lives, and which we have silently overlooked while living in society. By accepting the points of view of other participants in the social discourse, people evaluate them and test them in the light of their own knowledge and experience. In this way, we learn to notice the connections between our lives and the institutionally-shaped social order. At the same time, emancipation learning is not separate from the two previous types of learning,

but can be associated with instrumental and communication learning, based on them, but going beyond them. Thanks to this, our social world expands, with its borders are determined by our conscious participation.

Transformative learning is a radical change in the development of the cognizant subject. Such learning accompanies us in our everyday life, and is a natural phenomenon. Knowledge results from being alive in the world and constantly confronting information from the world with information from our life experience. It is not a canon of top-down truths that must be mastered and then followed. On the other hand, it is authentic knowledge, because it has a source in the everyday relations of the human-world type. This knowledge is particularly useful in the so-called transitional periods of life, requiring the reorganization of life and setting of new priorities. Transformative learning can also support the operation of larger social groups, such as social movements.

The theory of transformative learning also enables a new and different view of the phenomenon of learning. With regard to adults, it confirms constructive traits for adulthood, such as independence, self-control and freedom, and at the same time their social position. As such, it is a theoretical model that is attractive to education researchers. The author's statement quoted at the beginning of this chapter is not surprising, given that the transformative learning theory, despite the passage of time, has not only not lost its importance, but is also still dynamically developing.

1.1.5. The three dimensions of learning by Knud Illeris

Knud Illeris (born 1939) is a professor of adult education at two Danish universities: the Danish University of Education (University of Aarhus) in Copenhagen, and Roskilde University. Both universities are leading research centres in adult learning. Illeris also works with many universities in the United States, Europe and China. Currently, he is focusing his research on the general theory of learning. From the early 1960s to the late 1980s, he dealt with the general theory of education and was involved in the vocational training of youths and adults. From the beginning of the 1990s, he has focused his scientific activity on adult education, the implementation of the idea of life-long learning, and building of a theory of learning of adults. He is the author of several hundred books, reports and articles in this field, in which he redefines our understanding of learning. Based on his practical experience with the learning of adolescents and adults, as well as observations made in the 1960s and 1970s in one of Copenhagen's vocational schools, he has pointed out the weaknesses in our current understanding of learning. Consequently, he has built his own theory of learning based on three dimensions: the cognitive, emotional, and social (examined in more detail further on). Illeris's book on the subject quickly found global recognition, and Illeris himself became a significant figure in research on education and adult learning. One expression of this was when the European Parliament, during the Danish presidency, granted him the status of Consultant on education policy. Currently, Prof. Illeris mainly

conducts his research at the Danish Learning Institute of the Denmark Consortium on Workplace Learning, which he also established himself.

According to Prof. Illeris, education is "the social institution" playing an increasingly important role in contemporary societies. At the same time, it is an institution oriented towards intentional learning, which raises the social rank of learning.

In our everyday understanding, learning is the acquisition of new knowledge, new skills or the changing of one's views. Education systems include learning as an answer or reaction to being taught according to a set program. However, in light of Illeris's theory of three dimensions of learning, one statement is crucial: we can not learn without learning something. This 'something' can not be reduced only to the content or knowledge acquired at school or college. But learning also has an emotional 'something' in it, as it is always part of a context. Thus, it is a kind of interaction between the learner and their surroundings. The environment is always real and is characterized by a wealth of situations conducive to learning, or simply causing such situations. In his theory of learning, Illeris assumes that learning is:

> […] all processes leading to constant change – a psychological, cognitive, emotional change in skills, in views and social relations – which are triggered not only by biological development or aging. This means that this theory of learning also includes processes such as personal development, socialization, development of predispositions and qualifications, but only to the moment when they can be considered in the perspective of learning. […] it is important that learning must be understood as an actively constructed process. The learners themselves develop and construct their own learning, such as a teacher who can not really teach anything to anyone, but only enable him to learn (Illeris 2004: 90).

Illeris notes that in the traditional approach to learning, the age of the learner was not taken into account, assuming that it was not relevant. This resulted from the way learning was researched back then – researchers tried to learn about learning by observing humans and animals in laboratories and artificially-designed situations. However, the increasingly popular idea of life-long learning has forced scientists to consider whether, according to this idea, learning is to last for a lifetime, or whether in subsequent life stages it is the same, or if there are differences, and if so, what. According to Prof. Illeris (2004: 71–106), many researchers, including Malcolm Knowles, took the position that from a psychological point of view, adult learning is the same as that of child learning. Similarly, Alan Roger thought that adult learning has no specificity. Illeris argues that learning must be differentiated over the centuries, because the interaction between the individual and the environment at different stages of life is different. Learning in childhood is a type of acquisition, for 'conquering' the environment. A child is born in an unknown world and must 'acquire' this world. Learning here is parallel to biological development, and is possible as much as biological development permits. In childhood, learning is broad, comprehensive, 'uncensored' and full. It continues almost constantly and almost everywhere, and is limited only by the child's biological development. At the same time, in their learning children are significantly dependent on adults (parents, guardians, teachers), on their preferences and everyday behaviour.

Children learn the language or culture from adults, even when the adults are not specifically trying to.

> […] basically describing the child's learning, it can be said that as they grow, they are more and more absorbed in discovering the world through which they perceive themselves as part of it. In addition, and it is equally important factor, children expect suggestions and indications from parents and other adults about what and how they should learn. During infancy, they are linked to the surrounding world through the mother and other adults. The first discovery consists in separating oneself from the surrounding world. In this way, subjectivity begins to arise – a gradual release from the control of adults (Illeris 2006: 222–223).

Children's relations with the environment were originally seen as being uncritical. This theory is modified by today's increasingly complicated world, in which children experience a multitude of relations with their surroundings, and secondary experiences through the media, or the chaotic nature of the adult world. The media in particular is a source for children of:

> […] new experiences far greater than parents or other adults. They contain a lot of impulses, including such phenomena as disasters, violence and sex. These experiences, previously unavailable to children, can exert a strong influence on them and complicate the subsequent acquisition of their own experiences in these spheres (Illeris 2006: 223).

The experience of childhood affects learning in youth, which according to Prof. Illeris lasts from the moment of biological maturity to the moment of starting work and establishing lasting relationships with your life partner. Learning in this period is related to the formation of identity and the 'identity work' that young people do, their experience-building, building relationships with their life partner and finding their place in the social structure. In the past, this place was determined by family, gender, class background, profession and values promoted by young people. However, now:

> […] all this disintegrated and became ambiguous. Young people have to look for their own way by making independent choices. This does not apply only to education, professional career, partner and family. The lifestyle and identity must also be chosen. The changes that take place in these areas have been overwhelming. Young people and society as a whole now have to deal with new processes which have never been compared before, whose conditions change almost overnight. New educational opportunities and consumer, new communication systems, offers of new lifestyles, create a sense of chaos and confusion. Everything seems possible. And although young people still see countless limitations, and many possibilities are completely inaccessible to the majority – only few can become actors or sports heroes – many dream about them and hope to achieve them (Illeris 2006: 227).

For young people, the most important thing is to learn what factors favour the formation of their life orientation, and to make informed choices, "do not let life be wasted on trivial things" (Illeris 2006: 229). Society and employers require maturity and responsibility, and academic qualifications do not always

faithfully match professional tasks and remain valid for five or ten years at most, after which they need updating. This is why young people must be open and knowledge-oriented. As stated above, the period of youth ends when a person begins working and starts a family. However, this is not an age of stabilization, the continuation of a life course determined earlier, in youth:

> […] there is no way to permanently determine the course of life in our youth and expect that the rest of life will pass on its implementation (Illeris 2006: 231).

In fact, becoming an adult is not a one-off act, but a multistage process. Responsibility, problems, how to communicate, what to communicate, patterns of behaviour and lifestyle choices. Thus, the basic difference between learning as a child and learning as an adult is life experience. Adult learning is a self-directed process. (Illeris 2004: 123–125). It is a kind of education, and often expected (Illeris 2004: 123–125). At the same time, adults generally do not want to be treated like students (or in other words, children). Adults generally feel that this deprives them of their authority, and makes them feel that they should do better. From the perspective of learning, adulthood is usually dominated by a multitude of actions and thoughts. These are the criterion for choosing content and learning opportunities. In some cases, the choice can be conscious and purposeful, and in others automatic and unreflective. Adult life plans are often associated with family and professional ambitions. They can also be about free time, interests, politics and religion. Taking into account their life plans, adults give specific meaning to learning. They are able to learn a lot and learn how to plan a lot. Prof. Illeris provides the following example:

> […] when we watch TV, for example an information program, we can treat some information as we do not pay attention to it. received them in the first place. Many of them are interested in the field of computer science, adults learn to drive a car, but one of them will get them sooner or later (Illeris 2004: 124).

Illeris developed his theory of three dimensions of learning because in his opinion the then-current theories of learning, built on psychology, were too one-sided and too narrow, and hence insufficient in situations in which learning is the basis of a post-modern human's functioning:

> […] so far no theories of learning have appeared that would fully recognize the essence of learning in all its complexity. The behavioural theory of learning, which traditionally dominates this field of research, only takes into account a very limited part of this complex subject; other, broader theoretical structures, aimed at capturing the structure of learning, always do it from a specific point of view, which makes certain elements of theory emphasized while others remain in the shadow. Traditional competition between different schools of thought and different approaches to learning also seems to be unfavourable. Different aspects of learning, if they are absolutized, often lead to closure in positions that can not be described as erroneous, but which are rather one-sided (Illeris 2006: 15).

Illeris treats the ability of people to learn as a natural, biological ability, but also notes that in the postmodern condition it is a necessary ability. He also believed that at that point, no theories of learning had emerged that would fully recognize the essence of learning in all of its complexity. The behavioural theory of learning, which traditionally dominates this field of research, only takes into account a very limited part of this complex subject; other, broader theoretical structures, aimed at capturing the structure of learning, always do so from a specific point of view, which emphasises certain elements of theory while leaving others in the shadow. Traditional competition between different schools of thought and different approaches to learning also seems to be unfavourable. The different aspects of learning, if absolutized, often lead to closure in positions that can not be described as erroneous, but rather are one-sided (Illeris 2006: 15).

Prof. Illeris's theory of learning involving three different dimensions (cognitive, emotional and social) can also be analyzed from three different perspectives. (Hence, his theory is also considered to be comprehensive).

In the first dimension – the cognitive – learning is a process controlled by the central nervous system, and consists in acquiring knowledge and developing new skills. Referencing the learning theory of Jean Piaget, which focused on the cognitive aspect of learning, Illeris includes in his theory Piaget's idea that learning is a feature of the human species that is developed in phylogeny. This is the ability to adapt to environments in order to maintain a balance between the individual and the environmental, by assimilation, including cognitive structures drawn from the environment. Considering the cognitive dimension of learning, Prof. Illeris also evokes learning theories developed by other researchers, including David Kolb, Jack Mezirow, Lev Vygotsky, Alexander Luria, Thomas Nielsen, Gregory Bateson and Yriö Engeström. Based on analysis of their theories, Illeris further distinguishes cumulative learning, assimilation, and accommodation in the cognitive dimension of learning. In detail, these are described as follows:

- Cumulative learning usually occurs in the earliest years of life, when a person has to learn something 'from the beginning', that is unconnected with their prior knowledge. This is rote learning, also known as mechanical learning. It takes place under strictly pre-set conditions and its effects are unstable, and can also be considered 'unnatural'. Specific examples of cumulative learning are memorizing poems and formulas, and learning new skills (cycling, skating, etc).
- In assimilation, the mind absorbs impressions from the outside, which expands its existing library of experiences and differentiates them. The results of this kind of learning are knowledge and skills that can be used under various natural conditions – not just in the classroom or in other designed circumstances, as with cumulative learning. Assimilation is much less reliant on existing cognitive structures and the creation of new structures. Its main effect is the growth of consciousness. Learning from experience transforms into knowledge, which Illeris accepts in the same way as David Kolb does. Therefore, any learning is learning by experience

and thus has four stages: concrete experience, reflective observation, abstract conceptualization and active experimentation.

- Accommodation is the reconstruction of pre-established cognitive structures through their dissociation and reorganization. By accommodation, it is here meant that a person's internal world has to accommodate itself to new evidence with which it is confronted, and adapt to it. This can be a difficult and sometimes painful process, as it means learning information that does not fit pre-existing the fields and categories that person may have. Therefore, development of new fields and categories, to accommodate the new information, becomes necessary.

Another of the dimensions of learning highlighted by Prof. Illeris is the emotional dimension. In the cognitive dimension of learning, the key question is the course of the learning, while in the emotional dimension it is the impact of the learning on the person. Learning is about shaping mental structures, so that the structures are 'marked' emotionally. Emotions formed while learning determine the effectiveness and durability of the knowledge. Based on the scientific legacy of the American psychologist Hans Furth, whose proposed understanding of learning is an attempt to combine the theories of Sigmund Freud and Jean Piaget, and on the views of the German psychologist Ute Holzkamp-Osterkamp, Prof. Illeris comes to the following conclusions:

- People have a natural ability to learn, which is a source of energy.
- In childhood and youth, cognitive and emotional learning are integrated, but in school they are usually separated.
- Cognitive and emotional learning should be treated as two aspects of the same phenomenon.
- All of a person's mental structures are emotionally marked and their emotions influence what people want to learn, what they actually learn, how effectively and how long it remains in their memory.
- The emotional dimension is created and developed through relatively stable patterns of emotional behaviour.
- Cognitive learning is an element of emotional development, and occurs through assimilation and accommodation.

The third dimension of learning discussed by K. Illeris is the social, in which learning in the cognitive and emotional dimension is the reference point. Cognitive and emotional learning are primarily rooted in the biological and genetic abilities of the individual, while social learning is rooted in their social contexts and society. Learning in the social dimension is not biologically conditioned, but historically and the sociologically. Material objects also have a social character, because they are manufactured and transformed by people. Illeris here links to the social learning theory of Albert Bandura and the views of British researcher Peter Jarvis, and evokes a critical theory developed by the Frankfurt School – learning in the social dimension is associated with social interaction, the impact of socialization and interaction through the media, especially new media and ICT. It is associated with perception, transmission, experiences, imitation, active participation,

independence, responsibility and reflexivity. Nowadays, in post-modern societies these processes and competences are just as important as reading and writing, or even more so. Learning in the social dimension is primarily related to participation in social practice, action in communities of practice, and development of the meaning and feeling of social identity. With regard to the social dimension of learning, K. Illeris has arrived at the conclusion that a generally contemporary, post-modern society will be characterized by openness to social interaction.

The theory of the three dimensions of learning seems to be an interesting research proposal for a project on intergenerational learning and ICT use. The choice of this theory as a foundation for the project can be justified as follows:

- The broad view of the phenomenon of learning allows for a close scientific look at the practice of learning, including intergenerational relationships.
- It defines the subject of learning quite broadly, thereby minimising the risk of something important being overlooked.
- It takes into account the context of social relations, social openness, and focuses attention on new technologies that mediate communications and relations between members of society.

A schematic approach to Prof. Illeris's theory of three dimensions to learning can be illustrated as follows:
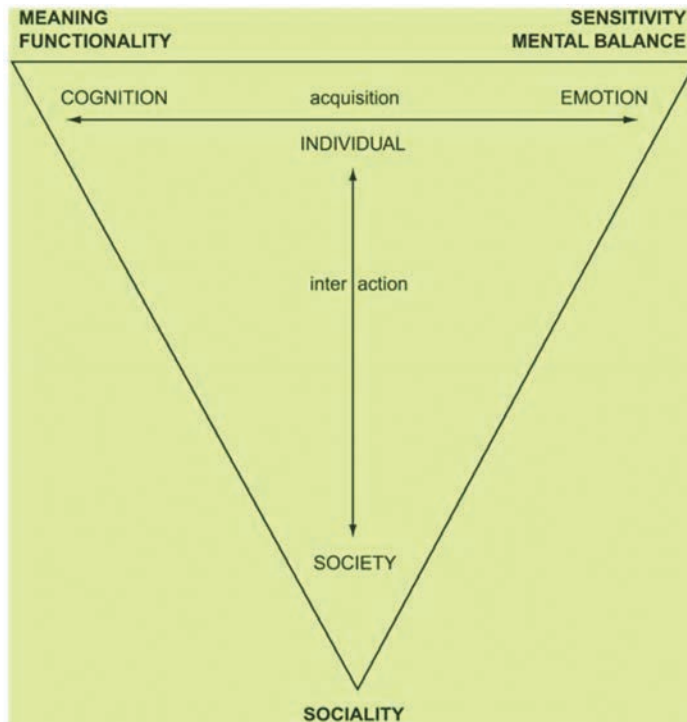

Figure 3. The three dimensions of learning
Source: Illeris 2009: 10

The model presented above, like every graphical and schematic representation in the social sciences, is a simplification of the theory developed by Prof. Illeris, but nevertheless approximately illustrates the basic assumptions and relations between the various elements of the theory of learning developed by Illeris, which is the theoretical basis of our own research.

The three dimensions of learning constitute a theoretical framework that has the potential to support practical work, ideas, and empowerment. This is why how people behave is not so much about what they were taught in school, but what they learned from the community and culture they live and work in, their emotions and experience, and the kinds of technology they use.

The renaissance of interest in the problem of learning that can be observed now can be associated with the entry of modern societies into postmodernity. One feature of post-modern societies is the increasing complexity and fluidity of social relations and the far-reaching fragmentation of human experience, and that institutional education must give up its current right to make sense in favour of preparing people for independent and subjective interpretation of meaning. The ability of people to learn is considered by Illeris to be a natural, biological ability. Under the conditions of postmodernity it is also a social necessity. Therefore, actions to improve people's competences in independent, reflective and critical learning must be treated as building their social survival potential. The problem is that previously developed theories of learning are characterized by the intellectual monoculture proper to the psychology of learning, which makes them too narrow and one-sided. Prof. Illeris's theory is not only based on knowledge of broader disciplines, but also embraces its subject in a broader cultural perspective. It defines learning as:

> […] any process that in living organisms leads to permanent capacity change and which is not solely due to biological maturation or ageing. This definition implies that processes such as socialisation, qualification, competence development and therapy are regarded as special types of learning processes or special angles from which learning is viewed (Illeris 2007: 5).

The three-dimensional model of learning theory is primarily a normative methodological postulate for researchers. It is also a useful tool for social research. By entering any concept of learning into a three-dimensional field of tensions, one can determine the degree to which these concepts take into account each of the distinguished dimensions.

The theory also tries to fill the gap between learning understood as acquiring knowledge, learning in social relations, and learning understood as the transformation of cognitive structures. The popularity of this theory is also evidenced by the enthusiasm with which Prof. Illeris is received in research centres around the world, and the constant and growing interest in translations into foreign languages of the professor's book on the theory.

The theory of three dimensions of learning seems to be an interesting proposition for research on adult learning, including for studies on the

intergenerational learning of teachers at school. However, this doesn't mean that the theory is devoid of weakness, although critical positions are relatively rarely raised at the current stage of development of the science of learning. Critics of the theory state that, first of all, it aspires to be 'comprehensive', but is so generalised that it applies to everything that has or can have an impact on learning. By focusing on everything there is the danger of losing what is unique. I am aware of this threat, but I think that the opposite is true; that is, the narrower understanding of the phenomenon of learning, which does not take into account its real aspects, is even less favourable. Too narrow an understanding would not explain the intergenerational learning phenomenon in the project. From this 'totality' another accusation arises, that this theory was created by combining or challenging selected theorems from previously existing theories, such as the theory of personality development of Jean Piaget, constructivism, the cognitive theory of learning from Thomas Nisssen, David's theory of learning A flask, Jerome Bruner's theory of learning, Sigmund Freud's psychoanalytic theory of personality, the socio-cultural theory of Lew Vygotsky theory, and Critical Theory. So it is a theoretical construction, built from fragments of other theories, through their acceptance or negation. Nevertheless, as the history of science shows, the rule is that new scientific theories arise either by questioning old theories, or by changing them, or just by combining them. In light of the characteristics of the selected learning theories presented here, I consider the theory of the three dimensions of learning to be an interesting proposition for research on intergenerational learning between young migrants and seniors, for the following reasons:

- Through its broader view of learning, this theory enables close scientific review of the practice of intergenerational learning.
- It takes into account the socio-cultural context of the location of learners.
- Its broader view of learning minimises the risk that something significant in the intergenerational learning of teachers will go unnoticed, at the same time opening new horizons for research.
- It does not reduce intergenerational learning to just one of many scenarios (behavioural, cognitive, constructivist, cognitive, social or cultural), and so creates an opportunity for a holistic view of learning. This also allows us to expect that research will result in a relatively holistic description of the intergenerational learning of teachers.
- It explains the significance of the subjects attributed to intergenerational learning.
- The theory is in line with the current tendency in education to depart from describing learning using purely psychological language.

The theory of three dimensions of learning devised by Prof. Illeris best corresponds to the research problem raised by the ICT Guides project, and appears to be the most suited to describing the nature of intergenerational learning. The three learning dimensions highlighted by Illeris constitute a theoretical framework for studying and explaining the course of intergenerational learning in the

workplace, while systematizing and integrating scientific knowledge on the subject. How young immigrants and seniors behave is not so much about what they have been taught in school, but about what kind of community and culture they live in, as well as their emotions.

1.2. The potential of intergenerational learning in educational problem solving

1.2.1. The educational potential of generations

It can be initially assumed that any collaborative work between people representing two different generations, consisting in sharing skills, knowledge and achieving goals, can be considered an example of intergenerational learning.

The idea of intergenerational cooperation and learning is derived from projects carried out in the 1960s and 1970s, in which elderly people looked after children with educational and emotional deficits, and difficult youths. In the 1980s, scientific research was begun on the subject, to try and elaborate a theory of it. At the same time, discussions on the practical possibilities of intergenerational learning began. Interest in intergenerational learning and intercollegiate relations in the educational context then intensified in the 1990s with the clear aging of an increasing number of societies and the growing awareness that the educational potential of intergenerational relationships was not being fully exploited. At present, intergenerational programs are interdisciplinary and function within the framework of pedagogy, gerontology, social work, psychology and political science.

From a biological point of view, the understanding of generations lies in the sequences of generations of organisms, the heredity of genetic characteristics and generative behaviour in the sense of reproduction. In these contexts, the term 'generation' has been used to describe the reproduction of a species based on a sequence of generations with alike genetic material. In the social sciences, a variety of views on generations can be found, with the term referring to a cyclic model, a basis for calculating the age of mankind, and as a category of cultural history:

> The genealogical idea of generations follows the biological approach and was introduced to social sciences by detaching it from its biological context and by conceiving of human generations as a constellation of relationships. When thinking of children, parents, and grandparents as generations within the family, then belonging to a generation also implies the assignment of roles which change more than once during a lifetime. Associating a human being with a certain generation thus is related to a stage of life and not to the year of birth (Schmidt-Hertha 2014: 146).

Researchers in the social sciences, including pedagogy, cite the views of Karl Mannheim (1893–1947) most frequently, and most of their work references his works and opinions. According to famous British researcher Gert J. Biesta,

> Most definitions of generation tend to follow Mannheim, but even so most generational catego-
> ries tend to be rather broad, and their boundaries fuzzy (Biesta et al. 2010: 74–75).

Mannheim perceived generations and intergenerational relations as being important from the point of view of science, and clearly emphasized the educational character of intergenerational relations. He claimed that a complete misunderstanding is the supposition – as many researchers make – that the real problem of generations only exists until it is possible to determine their rhythm, repeating at unchanged intervals. But even if it would be impossible to determine such intervals, the problem of generations would remain a fruitful and important field of research. According to Mannheim:

> Two approaches to the problem have been worked out in the past: a 'positivist' and a 'roman-
> tic-historical' one. These two; schools represent two antagonistic types of attitudes towards
> reality, and the different ways in which they approach the problem reflect this contrast of basic
> attitudes. The methodical ideal of the Positivists consisted in reducing their problems to quan-
> titative terms; they sought a quantitative formulation of factors ultimately determining human
> existence. The second school adopted a qualitative approach, firmly eschewing the clear day-
> light of mathematics, and introverting the whole problem. To begin with the former. The Posi-
> tivist is attracted by problem of generations because it gives him the feeling that here he has
> achieved contact with some of the ultimate factors human existence as such. There is life and
> death; a definite, measurable span of life; generation follows generation at regular intervals.
> Here, thinks the Positivist, is the framework of hum destiny in comprehensible, even measur-
> able form. All other data are conditioned within the process of life itself: they are only expres-
> sion of particular relationships. They can disappear, their disappearance means only the loss
> of one of many possible forms of historical being. But if the ultimate human relationships are
> changed, the existence of man as we have come to understand it must cease altogether-cul-
> ture, creativeness, tradition must all disappear, or must at least appear in a totally different light
> (Mannheim 1927/28: 276–277).

The biological foundations of a generation are important, but definitely not enough to explain the complexity of this phenomenon. A generation is above all a social group that characterizes specific patterns of behaviour and understanding of reality, and not just a group of people described by the time of their coming into the world and ancestors. People raised in different social, cultural and historical circumstances have different approaches to life, and different visions for solving problems based on their life experiences – they will then have different ways of thinking and different experiences, resulting from their interpretation of events from another point of view.

As a social construct, the members of a generation establish specific ties with each other, to create together and at the same time objectively define their generation's social identity. Individual members of the generation are similar to

each other in that they think about themselves in the same way, creating the same, characteristic way of understanding reality and relating to significant historical events. As a kind of heuristic simplification, one member of a generational might assume which ideals are important to other members of the same generation. This approach determines behaviour in certain social situations and creates a certain social bond that can influence, in a fundamental way, the creation of new cultural patterns in history:

> Generation location is based on the existence of biological rhythm in human existence-the factors of life and death, a limited span of life, and ageing. Individuals who belong to the same generation, who share the same year of birth, are endowed, to that extent, with a common location in the historical dimension of the social process. Now, one might assume that the sociological phenomenon of location can be explained by, and deduced from, these basic biological factors. But this would be to make the mistake of all naturalistic theories which try to deduce sociological phenomena directly from natural facts, or lose sight of the social phenomenon altogether in a mass of primarily anthropological data. Anthropology and biology only help us explain the phenomena of life and death, the limited span of life, and the mental, spiritual, and physical changes accompanying ageing as such; they offer no explanation of the relevance these primary factors have for the shaping of social interrelationships in their historic flux. The sociological phenomenon of generations is ultimately based on the biological rhythm of birth and death. But to be based on a factor does not necessarily mean to be deductible from it, or to be implied in it. If a phenomenon is based on another, it could not exist without the latter; however, it possesses certain characteristics peculiar to itself, characteristics in no way borrowed from the basic phenomenon. Were it not for the existence of social interaction between human beings-were there no definable social structure, no history based on a particular sort of continuity, the generation would not exist as a social location phenomenon; there would merely be birth, ageing, and death. The sociological problem of generations therefore begins at that point where the sociological relevance of these biological factors is discovered. Starting with the elementary phenomenon itself, then, we must first of all try to understand the generation as a particular type of social location (Mannheim 1952: 290–291).

Mannheim assumed that through shared experiences and mutual relations, each generation creates only the right knowledge. This is because people always see things already formed in a special way. They come up with concepts defined in terms of the specific context. Form and context depend in each case on the group to which we belong. Real assimilation with a group requires more than just acceptance of its peculiar values – it requires seeing things from its specific viewpoint, giving concepts specific shades of meaning and experiencing psychological and intellectual impulses in the configuration characteristic of the group. This means further absorbing those interpretation-forming principles that allow the individual to deal with new impressions and events in a predetermined way by the group. The Hungarian-born Mannheim explains it in the following way:

> In contrast to the imaginary society with no generations, our own-in which generation follows generation-is principally characterized by the fact that cultural creation and cultural accumulation are not accomplished by the same individuals – instead, we have the continuous emergence of new age groups. This means, in the first place, that our culture is developed by individuals who come into contact anew with the accumulated heritage. In the nature of

our psychical make-up, a fresh contact (meeting something anew) always means a changed relationship of distance from the object and a novel approach in assimilating, using, and developing the proffered material. The phenomenon of 'fresh contact' is, incidentally, of great significance in many social contexts; the problem of generations is only one among those upon which it has a bearing. Fresh contacts play an important part in the life of the individual when he is forced by events to leave his own social group and enter a new one-when, for example, an adolescent leaves home, or a peasant the countryside for the town, or when an emigrant changes his home, or a social climber his social status or class. It is well known that in all these cases a quite visible and striking transformation of the consciousness of the individual in question takes place: a change, not merely in the content of experience, but in the individual's mental and spiritual adjustment to it. In all these cases, however, the fresh contact is an event in one individual biography, whereas in the case of generations, we may speak of 'fresh contacts' in the sense of the addition of new psycho-physical units who are in the literal sense beginning a 'new life'. Whereas the adolescent, peasant, emigrant, and social climber can only in a more or less restricted sense be said to begin a 'new life', in the case of generations, the 'fresh contact' with the social and cultural heritage is determined not by mere social change, but by fundamental biological factors. We can accordingly differentiate between two types of 'fresh contact': one based on a shift in social relations, and the other on vital factors (the change from one generation to another). The latter type is potentially much more radical, since with the advent of the new participant in the process of culture, the change of attitude takes place in a different individual whose attitude towards the heritage handed down by his predecessors is a novel one (Mannheim 1952: 293–294).

This means that knowledge is socially produced and depends on historical position. Mannheim notes that people, regardless of age and occupation, can acquire knowledge (learn) and transfer it to others under appropriate conditions. It follows that our concept of science is much too narrow in relation to existing areas of knowledge, and that possible and transferable knowledge does not end where the results of scientific research end. Therefore, intergenerational relationships give access to knowledge that is not yet included in the scientific framework. This is pre-scientific knowledge, often based on intuition. But that does not mean it is less important and valuable. On the contrary, it is important because it complements the lack of scientific knowledge, allows new research problems, broadens horizons and enriches human experience. In this approach, a person and their generation produce and master unique knowledge, just as every historical moment is unique. The scientist does not have access to this knowledge; it cannot be developed in the form of a textbook, and the teacher at school cannot give it to students (a younger generation). Such knowledge, understood here broadly as a result of communication, perception, judgments about scientific theories, beliefs and views, is a way to supplement scientific knowledge derived from the absolute by means of quantification, classification and systematization that does not capture the specific temporal location of a human being. Mutual relations between people representing different generations and communities allow access to knowledge, taking into account the historical, social and cultural context of its creation. At the same time, the limitation in thinking, consisting in the historical placement of a given person, is removed. According to Mannheim, however, what is certain is that there is a very large range of content available either only for specific individual entities, or only for specific historical stages, or

only open to specific social trends. An example of the first situation is that only a person who loves or hates can perceive a beloved or hated person, who is not otherwise visible in this way to other people. But it is also a purely sensual condition of cognition that specific features of other people can be included only through cooperation. Firstly, because observation of another person takes time, and secondly, that other person does not have any separate properties that – as is usually incorrectly said – can come to light. In a human being, a dynamic process takes place, that is, the person develops in action and confrontation with the world. Also, our self-discovery does not take place in contemplative self-observation, but only in confrontation with the world. It follows that there are skills and knowledge whose learning is not only conditioned, but above all caused by historical conditions, such as the presence of one and not another authority, characteristic figures, events, ideas, levels of economic development, fashion, spiritual life and personal desires. Replication of the complex sequence of these conditions is impossible in the following generations, so their learning will have a different character (object, content, results, means), and will lead to different types of knowledge and skills.

Mannheim's position, quoted here, is the most valid for undertaking the issue of intergenerational learning. First of all, because Mannheim draws attention not so much to ties of blood or time of birth, but to other, specific kinds of ties, such as social, cultural, economic and political. For social research, this second understanding seems more appropriate, which by its own definition could be called a socio-cultural approach – a qualitative approach in which a generation is a group of people born at a similar time, having the same historical and ideological experiences, different from the experiences of preceding and following generations. The process of formation of a generation acquires significance when it can simultaneously be separated from existing ideas, and have the opportunity to create new ideas, which often contradict the existing ones. Due to the fact that in a certain period of time two contrasting cognitive, ideological and ideological currents can co-exist, from members of their own group (the newly-formed generation), loyalty and devotion are required. These elements create a conceptual framework for determining the meaning of a new generation, and also assume a socializing factor integrating new members of the nascent generation.

The qualitative aspects of its functioning are characteristic of each generation. The concept of the generation in Mannheim's context assumes, however, that it is a group of people of a similar age who share the historical experience they have lived together. Mannheim points to the high value and pedagogical and educational potential of mutual intergenerational relations.

In education, the emphasis is put on the utilization of opportunities that are present in all representatives of the generations. This is expressed in the interest of educators in setting the developmental environment, developing young people's skills in finding and choosing values, and supporting their creativity. In relation to adults, it means providing them with support in appropriate work and enabling the experience of older people.

The fate of individuals of different ages, whose specific historical events are involved, is very logically connected with the concept of man and the concept of education understood as help in development, and this accompanies the development that can be shared by the individual in different periods of their life. This means that the same person, being a representative of one generation, can participate in various configurations, depending on their biological age, life phase and expected social roles. This concept of 'generation' includes everyone participating in a given historical time and introduces a significant dimension of time and space, constituting the framework of the activity. So the generation is then a group of people with common attitudes or value systems that are the result of a shared historical experience.

Nowadays, as a result of socio-economic changes and a pluralizing society, an increasingly significant cultural difference can be seen between generations. This difference consists in a complex of religious imagination, knowledge, values, morals, customs, and behavioural patterns. Contemporary culture is strongly created by relationships between generations. M. Mead distinguishes three types of culture: the post-figurative, configurable and pre-figurative. In each there is a different way of thinking about the individual units forming a generation and other approaches to solving the life crises of the individual. The parents of modern teenagers had the opportunity to develop in the post-figurative culture, but now not only is the transition to a configurative culture being increasingly observed, but also a significant change in the way intergenerational functioning is defined as a pre-figurative culture. Intergenerational differences appear in the way people think about life, and in the definition and characterisation of these three types of culture.

Cultural transmission in post-figurative cultures is predominantly from the elder to the younger members of a society. Post-figurative cultures are strongly oriented on the past, and family honoraria and ancestor veneration often figure prominently. The second one – configurative culture is present-oriented. Cultural transmission is between contemporaries (Mead 1970: 32). Configurative cultures, such as the youth culture of the 1960s and 1970s, arise when a post--figurative culture breaks down. 'I' is characteristic of the configurative culture in which people's relationship with the past is weak, creating a permanent weakening of the sense of belonging. Children in such cultures have the feeling that due to various distractions and atomization of the content offered to them, they live in a world of constant change. The result of this is uncertainty of behaviour and an unstable value system. Back in the 1960s–1970s, it was much more difficult to forecast future trends and changes, and so it was harder to tell young people how to live so that their futures would be of a good quality of life. There was no support from adults, either, as they were themselves in a new situation for which they had not been adequately prepared.

The new kind of culture is pre-figurative. The shift to pre-figurative culture has been driven by the rapid development of information technology – the so-called Digital Revolution, or 'future shock' (Toffler 1970). Pre-figurative culture

is future-oriented, and cultural transmission predominantly occurs from youths to elders. As M. Mead predicted,

> I believe we are on the verge of developing a new kind of culture, one that is as much a departure in style from configurative cultures, as the institutionalization of configuration in orderly – and disorderly – change was a departure from the post-figurative style. I call this new style pre-figurative because in this new culture it will be the child – and not the parent and grandparent – that represents what is to come (Mead 1973: 204).

The culture of literacy, also called book culture, persisted from the sixteenth century until the twentieth century and created a monopoly on adult knowledge, insofar as only literate adults had full access to recorded information. However, with the development of open-access information technologies, such as mobile-phones, smart-phones, computers and the internet, the knowledge hierarchy collapsed. The process of making information uncontrollable, according to Neil Postman, has resulted in the disappearance of childhood as a social category subordinate to adults controlling access to information. As a result, for the first time in history, adults (teachers) and children (pupils) have access to the same sources of knowledge (Postman 1982). However, access to knowledge itself does not equate to willingness or readiness to use it.

Pre-figurative cultures are set for the future and for fast change, and quick responses to change are a necessity. A characteristic feature of this culture is adaptation to the contemporary environment, which is focused on the development and creation of new technologies (in this case, ICT), which is helpful in the everyday life of a human being. In the pre-figurative culture there is a break with tradition, the past and history. New traditions are created and new ways of life are looked for, because old solutions can not be used anymore. In this culture, a stance on the future becomes a central value, which is expressed in the slogan 'the future is now'. New forms of communication between generations will emerge. The younger generation learn to communicate with adults, while adults and elders have to learn new relationships with the young. Subsequently, new challenges arise in the field of intergenerational communication. More and more attention is paid to increasing the responsibility for communication processes. All participants in communication are sources and recipients simultaneously – not, as was before, that older generations were communication sources and youth was recipient). This model assumes mutual intergenerational coopera-tion, which occurs spontaneously as a result of the communication process and whose course and results are difficult to predict. Certainly, an important role in intergenerational communication is played by new media and new technolo-gies, which not only mediate in communicating, but also help create cyberspace, which is a place of intergenerational meetings. This means that intergenerational relations, communication and learning do not take place in a contextual vacuum. Instead, this context is most often the new media that give the messages an interpretive dimension, and this forces further inter-generational interaction. This

then means that the tools used to communicate strongly define the way in which people communicate, and vice versa: the means of communication influence the development of these tools. Individuals participating in intergenerational relations acquire skills conditioning how they communicate with the environment.

Assumptions about the benefits of international cooperation have influenced many educational and social activities. These are more and more specially-designed forms of intergenerational education, such as integration meetings, reading together, theatre classes, computer, culinary and art workshops, DIY, cultural and tourist events, and regional education activities. These are formal activities that take place in pre-schools and schools of all levels. On April 29th, European Day is celebrated in solidarity between generations. This holiday was created by the European Union in 2009.

The issue of 'generations' takes into account the thesis that man is a relational being, developing in a mutual relationship with the socio-cultural environment, of which modern technologies are becoming an increasingly important part. But in spite of its undoubted educational advantages, the generations have not yet been fully developed in the practice of educational activities.

1.2.2. Intergenerational learning as empowerment

Empowerment (social strengthening) has been seen in our thinking about social action and social work for over 30 years now. In the face of cultural changes and emigration, the idea of empowerment has grown. This is the direction of action in a social policy and social work. It consists in processes of knowledge, skills and confidence development. It builds social cooperation and opens up positive environmental factors as sources of changes and improvements. The aim of this is to strengthen and support individuals and social groups in difficult situations, or that are deprived.

As history shows, the nineteenth century was known as the century of the child. However, the 20th century, especially in the second half, was characterized by a growing interest in adult education. This came from, amongst other sources, social and economic changes requiring lifelong learning. In turn, in the 21st century, careful attention is being paid to all members of society, regardless of age, in accordance with the idea that 'society is for all age categories'. In modern social policy, old age and the elderly (who affect both the shape of a society's life as well as individual lives), are moving towards participation, and thus towards intergenerational integration, in accordance with the slogan 'towards intergenerational solidarity'.

Having explained the concept of learning, it is time to move on to the key issue in this work, which is a special kind of learning – intergenerational learning. In intergenerational learning the assumption about the educational potential of intergenerational relations is an accepted fact. It is a form of involvement between two generations in an activity to achieve mutual benefits. In the course

of this activity specific learning outcomes are produced. Based on the interpersonal relations at play, which stimulate people to learn and develop different strategies of communication, the elderly – in contact with youths – recall the ideals to which they aspired in the past. In addition, older people are intellectually stimulated by younger people.

Nowadays, intergenerational learning is being undertaken more and more often. It's validity is recognised by scientists, who have reflected upon it in numerous scientific publications (Bengtson, Biblarz, Roberts 2002; Bengtson, Furlong, Lufer 1974; Brannen, Moss, Mooney 2004; Brown, Ohsako 2003; Cappella, Heiner 1990; Davis, Larkin, Graves 2003; Doumas, Margolin, John 1994; Jacker 1992; Mazor, Tal 1996; McClusky 1990; Newman, Hatton-Yeo 2008; Noël, de Broucker 2001; Prettner, Praskawetz 2010; Quiet, Smith 2011; Silverstein 2004; Storm, Storm 2001; Tapscott, Frick, Wootton, Kruh 1996; Thomas 2009), as well as various practical educational activities. The European Commission treats intergenerational learning and the intergenerational transfer of knowledge and skills as the primary factor in achieving the objectives of the Europe 2020 Strategy.

The social and educational role of intergenerational relations is a constant element in this kind of learning. The basic thesis of intergenerational learning assumes that the key role is played by the process of socialization, or more precisely that it is based on the assumption that experiences in socialization have a decisive impact on knowledge, skills and value systems, thus having other important educational consequences.

The role of intergenerational transmission is important, including in the process of upbringing and socialization, in lifestyle, in social status, recognized values, principles of conduct and life goals. Generally, in intergenerational learning, it can be assumed that:

> A generation consists of a group of people born during the same time period and who are united by similar life experiences and a temporarily coherent cultural background. People belonging to the same generation have the same location in historical dimension of the social process (Antikainen et al. 1996: 34).

Recently, the role of this kind of learning has become more important, because of social and international changes:

> Particularly, migrant groups, inter-generational exchanges appear both to help maintain existing collective identities while simultaneously enabling adjustment to a new context. A recent qualitative sociocultural study of children/grandparent learning among Sylheti/Bengali-speaking families in east London explored ways in which grandparents served as 'founds of knowledge ' that had been passed on in the past, including key social and communicative competences that older adults had not previously accessed, such as familiarity with new technologies (Kenner et al. 2007: 78).

Gert Biesta draws attention to the relationships between learning and generations having a long history in educational thinking, especially in terms of the

intergenerational transfer of knowledge and values (Biesta 2011: 6). His study noted the important role played by many grandparents, in the context of mothers being increasingly engaged in the labour market (Biesta et al. 2010: 83). Biesta and his research team, drawing on the sociology of Karl Manheim's knowledge, adopted the assumption that intergenerational relations allow "fresh contact" with the collected heritage of different generations. Relations between generations have a long tradition of research, but have so far been reduced to the transfer of knowledge and values from older to younger generations, that is, it has been a one-way process of raising the younger generations by the older ones. However, nowadays, rapid development of modern technologies and social and cultural changes have reversed the direction of transfer. This is beneficial from an educational point of view but it can lead to intergenerational conflicts. From a scientific point of view, knowledge of intergenerational learning is underdeveloped compared to the practice of it. There is no coherent theory explaining the course of intergenerational learning. This is expressed by the fact that so far there are only indications, but no scientific evidence, that intergenerational relationships positively influence learning, that they support the development of individuals, societies and national economies. The research on intergenerational learning that has been conducted so far has mainly been from the perspective of children and young people, and shows that it can reduce social isolation and increase self-esteem. At the same time, the intergenerational relationships themselves are not directly 'learning', but only its circumstances and opportunities. Intergenerational relations are a method of social localization, and also influence attitudes towards one's own learning.

Ethnic identity plays an important role in intergenerational learning. Especially in immigrant groups, it helps to maintain a collective identity while enabling adaptation to new socio-cultural conditions. Intergenerational learning takes place particularly intensively in families that abound in personal and cordial relationships, which means that each subsequent generation is similar to the previous generation in certain ways. In studies on intergenerational learning in a group of Bengali-speaking families, it was proved that the grandparents were treated as a source of knowledge that had been passed on to them in vain, including social and communications competences. At the same time, the children acquired skills that their grandparents did not have, such as knowledge of new technologies. It was also found that the particular role of intergenerational learning is attributed to situations in which the mothers are professionally active.

Intergenerational learning is not only about children, but also adults and the elderly. Adults compare their knowledge with the knowledge of the elderly, but also with the knowledge of children, and try to adapt. It can also happen that intergenerational relationships are barriers to learning, when there are prejudices or communication misunderstandings. An example here is the learning of women, which mainly results from the fact that it is usually women and not men who must care for the children and elderly relatives (Biesta et al. 2010: 72–83).

Despite some weaknesses, intergenerational learning is considered beneficial for human development. For young people, their often unrealistic view of the world, when brought into contact with older people, is subjected to strong correction (McClusky 1990: 65–73). The parts of intergenerational learning that stand out (Brown, Ohsako 2003: 151–165) include:

- *Learning from each other* – different generations share their experiences, and the result is knowledge, skills and competences.
- *Learning with each other* – this is common learning about the world, society, historical events, etc. It is learning facts rather than objectives, which for whatever reasons are important to the members of both generations.
- *Learning about each other* – this is the exchange of experiences, and sharing outlooks, values and aspirations.

In the field of study of intergenerational learning it is considered that the impact of all partners involved is equal, or even – in a special way – the role of the young people is overemphasized (Storm, Storm 2011: 133–146). This is a kind of 'rebound' effect: after a time, the youths have been mainly just listening to their elders (parents, grandparents and teachers), because their elders have a monopoly on knowledge.

The appearance of new technologies and universal access to knowledge has caused profound changes. Young people are skilled with new technologies, and thus have greater access to knowledge. In the face of this, their elders mostly function as consultants, advisers and facilitators. Intergenerational relationships have an educational character and potential for the future, because the structure and culture of schools, as created by the middle generation, mainly affects the youngest generation (children and adolescents). In addition, the generations and their attitudes can influence others. An example of this is the baby boomer generation (1946–1964), who perceive themselves as eternally young and enthusiastic about learning, because they treat learning as a form of expression of their youth.

Intergenerational learning is usually considered to take place freely and spontaneously in society and culture in intergenerational relationships. However, it is possible to create convenient conditions for the processing of intergenerational learning by educationists and educational institutions. Therefore, before running the intergenerational learning courses within the ICT Guides project, specific recommendations and principles were formulated to the facilitate the successful course of the workshops.

In intergenerational learning, bridges are created between the past, present and future. The biographies, experiences, events and stories of events are reconstructed. However, in the context of intergenerationalism, the differences between children and adults should be taken into account, as well as the social organization of these differences. This is not about the issue of generational justice, and therefore the distribution of benefits, resources and opportunities between children, adults and seniors (which is evident, for example, when granting social benefits or providing opportunities for further education). Instead, it is mainly about the characteristics of social and cultural processes that make individuals 'children', 'adults'

and 'seniors'. Intergenerational learning should be considered in conjunction with the impact of social and cultural structures, which shows social and cultural diversity and mobility. Context for the ongoing shrinking and expansion of families, as well as the consequences of these processes for particular generations, are the new heterogeneities, ambivalences and conflicts born in modern societies. These affect family configurations, activities, interactions and self-concepts, and intertwine with scientific and practical areas of social work.

The basic principle of implementing intergenerational learning is to ensure proper interpersonal communication, including creating the conditions for participants to establish intergenerational dialogue based on understanding, tolerance and kindness. It is also necessary to inspire the different generations to work together within jointly-designed and implemented projects. To facilitate interpersonal communication, at the first intergenerational meeting it is worth setting the ground rules with all the participants. All intergenerational educational activities should begin by determining the resources inherent in the participants. It is worth developing a so-called information bank of data on the participants (their knowledge, skills, interests, passions, abilities and so on). An understanding of the needs and expectations of the participants is also vital, and it is also extremely important to establish the mutual knowledge of the class. Proposals for fun classes can be asked for here. Play activity has many positive effects on people of different ages, including easier familiarization for all participants. The subject matter of the classes given to the different generations should be interesting for both the youths and the older participants. Opportunities for each participant to actively participate in the classes should also be ensured. It's worth designing scenarios for all classes, to enable each person to be able to present their own resources. One significant way of implementing this principle is by carrying out a detailed diagnosis of the needs, expectations and opportunities of the participants. Intergenerational education classes should be evaluated by all of their participants. It's worth taking into account what the participants liked and didn't like, what they thought of the classes generally, and what they think could be improved. Intergenerational learning creates knowledge through its sharing between older and younger people; it strengthens the harmony between generations and opens a new approach to thinking about other generations throughout the entire life cycle. It provides purposeful reinforcement of self-esteem and life satisfaction for its participants, increases social capital from generation to generation, and empowers individuals and groups within and between generational groups.

Potentially, these are the benefits of intergenerational learning, but nevertheless we must clearly define the goals to be achieved by it. While learning is usually associated with an individual process, education is perceived as a systematic, organized, often hierarchical process that is conducted by institutions in which assessment and accreditation can occur. Due to its informal nature, elements of cooperation, reciprocity and democratic strategies, intergenerational learning is easily interpreted as an obvious good.

Summary

The issues of learning presented in this chapter, then narrowed down to a particular type of learning (intergenerational learning), allow us to formulate a key constitution for the problems covered in this book. The conditions for intergenerational learning are direct or mediated (for instance, by ICT tools) intergenerational relationships, but at the same time, the relationships themselves are not the same as learning, only the possibility of the learning. Intergenerational learning consists in acquiring new knowledge, skills and competences, but also fosters the creation of knowledge, skills and competences that the participating generations did not originally have access to. As such, it plays a very important role in human life and contributes to the stimulation of lifelong learning. It is a perfect complement to the scientific knowledge acquired at school, as it allows the acquisition of knowledge that science has not captured yet, assuming that the boundaries of knowledge are not the same as boundaries of science, but endlessly wide. This is also knowledge that can't be taught at school. The effect of intergenerational learning can be scientific knowledge (objective), supplemented by individual reason, and thus more fully explaining the learner's increasingly confined reality. Knowledge acquired through intergenerational learning is not contrary to scientific knowledge, because it is a different type of knowledge and contradiction can not occur. It also allows for cultural resources absent in formal education to be accessed.

Another result of intergenerational learning is the ability to go beyond our own knowledge and change the context of our thinking, which is a pro-developmental factor. Generations are living contexts and as such are more attractive to learners in form and content than school lessons and textbooks. They allow us to look at ourselves from the perspective of others and vicariously live the lives of other generations. This enriches us not only intellectually, but also spiritually, allowing us to distinguish ourselves from others and thus further shaping their identity. Familiarizing ourselves with the problems of other generations helps us to identify, understand and solve our own problems. It endures the non-historical character of cognition and thinking, and allows us to see ourselves from the perspective of time, which in this sense does not pass. Reflecting on what was possible, we can consciously participate in what will be. Intergenerational learning is a way of experimenting with learning in relatively safe conditions, with a wide range of freedom in entering the individual into intergenerational relationships. It depends on freedom, not coercion, and thus develops volitional processes to which school is not conducive.

Chapter II

Immigrant youth education and early school leaving – challenges to contemporary education

Joanna Leek

Introduction

This chapter focuses on selected issues in the education of refugees, and in this context also on early school leaving as a challenge for European educational systems. In the Conclusion, recommendations are presented on how to prevent students dropping out of school, and how to support the education of young immigrants. These were formulated as part of the research conducted within the ICT Guides project. Before the project started, we assumed that if properly implemented it would offer new contexts for promoting social inclusion among the youths that would be actually conducting the ICT classes for the older, resident adults. With the ICT Guides project, we wanted to provide the refugee youths taking part with opportunities to be part of the decision-making process, to get involved in work that is relevant to youth, and perform challenging tasks allowing them to share power and collaborate with the adult staff and volunteers (Benson et al. 2006; Zeldin et al. 2005). The two-level recommendations in this chapter for schools and policy makers are of a universal nature. Thus – as we believe – their implementation might improve the education not only of immigrant youths and early school leavers, but of the entire young population of Europe and beyond.

2.1. Education of immigrant youth – an overview

The United Nations High Commissioner for Refugees (UNHCR) reported that in 2015, nearly 65.3 million people around the world were forcibly displaced from their homes. Of these 65.3 million refugees, 38% were forced to leave their country and become asylum seekers (UNHCR 2016). More recent reports show that people are becoming refugees mostly because of war and conflict, but also natural disasters, political risk and civil unrest (UNHCR 2017). One distinctive feature of refugees is their forcible displacement, which differs them from other kinds of migrant groups, such as expatriates and skilled migrants. Their displacement can be from one place to another within their own country, or across borders, when they are forced outside their country (Hollifield, Martin, Orrenius 2014). Accompanied by broken family and social structures, immigrant youths suffer in many cases from loneliness and isolation, as well as the interruption to their education.

Following forced migration to another country, individuals receive refugee status when they legally settle there (Sheikh et al. 2018: 23). Once their residence status is established, further challenges arise for the newly-arrived. For youths, they begin learning the language and enrol in school, however in some cases they might lack the ability to meet the levels of knowledge and skill required by their schooling. The demands of being a student in a new country entail several "behaviours or skills, formative experiences and a great deal of knowledge" (Miller, Mitchell, Brown 2005: 25), which might be challenging for young refugees. As school students, in a lot of cases refugees experience the distribution of power within a schools' social, cultural and institutional structures in combination with a sense of their own agency or power within these systems (Datnow, Hubbard, Mehan 2002).

A student's engagement in education is the sum of their individual motivation, school policy, institutional bias and various risk-factors (Brown, Rodríguez 2009). Researchers claim that with socially just aiming in mind, schools can empower students with refugee backgrounds (Major et al. 2013). They can support students' social capital through explicit teaching of values and development of a culture of inclusion, respect and reciprocity in school (Woods 2009; Block, Somers 2014). Even so, after arriving in a new country, refugees experience culture shock, or find the foreign lifestyle challenging (Hocking, Kennedy, Sundram 2015), and in many cases are at risk of dropping out of their new school.

Current studies on refugees and their school attainments show, as Mehak Sheikh and Joel R. Anderson (2018) claim, that it is their highest extant level of education that most supports their general integration and well-being. This is because participation in education is an opportunity to interact with individuals from other cultural groups, outside of one's own (Morozov 2011; Valtonen 1994), and to develop relations with school-based peers (Dinh et al. 2013).

A distinctive feature of a refugee's life is the educational gaps in which young refugees are without access to formal education. Educational gaps also happen when refugees have recently arrived in their new country, and are still in the process of finding out how its education system works. The results of research clearly show that this transitional period is critical for refugees; the longer young immigrants go without access to education, the more likely they are to become marginalized or excluded (Chan, Loveridge 1987; Stein 1981). Therefore, as Sheikh and Anderson (2018) put it, in this context "it is important for this education gap to be as minimal as possible, and efforts to reduce the negative impact of relocating for refugees could focus on the provision of quality education while refugees are displaced, awaiting resettlement or upon arrival to a new community" (Sheikh, Anderson 2018: 30).

2.2. Youths – between early school leaving and social exclusion

Europe is a popular destination for refugees from different parts of the globe. From the various refugee crises to the moving of the EU border at the English Channel, migration is influencing politics and the social landscape of the 'Old Continent'. The European Commission promotes the full participation of everyone living in Europe, introducing integration policies and promoting and protecting cultural pluralism. Immigration policies are Europeanized through treaties that obligate the countries that sign the agreements. However, there remain differences between national integration policies and Europe-wide immigration rules.

In the 2010s, the European Union faced a worsening of the social situation caused by the economic crisis, which was undermining the sustainability of social protection systems. 24% of the EU population was at risk of poverty or social exclusion, including 27% of all children in Europe (Eurostat 2015). As highlighted in the 'Youth on the Move' document (European Commission 2017), detailing one of the EU's flagship initiatives dealing with this problem, a significant decrease in the number of pupils dropping out of school represents an investment not only in youth, but also the future of the EU itself – especially for its social cohesion and wealth. For example, 100,000 youths start high school in Sweden every year, but approximately 25% drop out or leave without graduating. 50% end up being socially excluded. Unemployment is sky-high in general, but for the young who were born outside Sweden the unemployment rate is 70% higher than for youth born in Sweden. Early School Leaving (ESL) was recognized in 2010 by the European Commission (European Commission 2010a) as one of the main challenges faced by European societies, mostly because of recognition of the role of education in social and economic growth. In the Europe 2020 strategy, the European Commission (EC) set a target for reducing ESL to less than 10% by the year 2020 (Commission Communication Europe 2020, 2010a).

European reports on early school leaving directly indicate the connection between refugees, early school leaving and social exclusion. Social exclusion can be understood as isolation and alienation from economic, social, political and cultural life, as well as isolation from even informal support networks (Robinson, Oppenheim 1998). Another definition emphasizes the length of time that individuals and groups spend in poverty, in relation to the decrease in social resources and mutually-supportive local networks (Gregg 1998). Ruth Levitas et al. (2007) describes social exclusion as a complex and multi-dimensional process. "It involves the lack or denial of resources, rights, goods and services, and the inability to participate in the normal relationships and activities, available to the majority of people in a society, whether in economic, social, cultural or political arenas. It affects both the quality of life of individuals and the equity and cohesion of society as a whole". Despite the different understandings of social exclusion, there are several common determinates of youth exclusion in Europe:

discrimination, lack of citizenship and/or residence, poor education, and poverty. All of the determinates affect all youths living in Europe, but particularly immigrant youths in terms of discrimination based on nationality, ethnic background and language. Preconditions for enjoying basic economic and social rights in European countries such as a permanent address, a residency permit, and legal status in the host-country, are often missing for immigrants or those born in an EU country to immigrant families. Important determinates of social exclusion are bad experiences in education, which in many cases lead to early school leaving. Lack of vocational training or barriers to affordable, quality education lead to poverty and unemployment.

The use of ICT is widely recognized as having an impact on different aspects of society, including education, training and employment, and contributing to universal access to education and equity in education. There are also some research findings emphasizing the positive influence of ICT; improving student motivation, engaging low achievers (Balanskat, Blamire, Kefala 2006), improving students' performance, and contributing to a more efficient learning process are often quoted as benefits and confidence and engagement boosters (Blamire 2009). A 2013 UNESCO report (UNESCO 2013) provided extensive evidence that ICT improves affordability, accessibility and adaptability in education. Using ICT in education allows students to efficiently access digital information, supports student-centered and self-directed learning, produces a creative learning environment, promotes collaborative learning in a distance-learning environment, offers more opportunities to develop critical thinking skills, improves teaching and learning quality and supports teaching by facilitating access to course content (Fu 2013).

The research conducted within the ELFE-ESL project (Teacher Unions Preventing Early School Leaving through the Use of ICT in Education) aimed to identify how innovative pedagogic use of ICT can help attract potential drop-outs back to school and to learning. The research findings have been presented in the form of recommendations to teachers, teacher unions and other stakeholders on the European level. Recommendations for immigrant pupils emphasized the need to take into account their social and cultural backgrounds when discussing re-integration of drop-outs and those at risk of early school leaving. What is significant here is taking into account these backgrounds, and adjusting the teaching material in to the needs of the pupils, to re-engage and motivate potential early school leavers. Other recommendations from the project are the need to regularly update IT equipment to be sufficient for use. Additionally, on a school-wide level the teachers should be trained on how to use ICT tools, and potential early school leavers should be given the responsibility of choosing the methods and ICT tools that fit their vision and needs.

2.3. Profile of the early school leaver

The profile of the early school leaver varies considerably within the European Union (EU) according to the student's highest achievements their status on the labour market and their ethnic origin. While the reasons for early school leaving are highly individualised, ESL as a social phenomenon follows certain patterns. Becoming an early school leaver is a process and not a one-off event. In general, early school leavers come from: (1) poor, socially disadvantaged and/or low-education backgrounds; (2) disadvantaged minorities with migrant backgrounds, and (3) vulnerable groups, such as youths with public care backgrounds, teenage mothers and persons with physical and mental disabilities or other special educational needs (European Commission 2010: 9). Marie Lally has divided the common reasons why young people leave school early into four groups (Lally 2012: 2). The first group is personal reasons. Lally mentions low self-esteem, substance misuse/abuse, undiagnosed or not effectively supported learning difficulties, and lack of motivation. The second group is social reasons, such as anti-social behaviour, poverty – pupils living in low socio-economic neighbourhoods who opt out of school due to the costs involved. Family reasons are the third group listed by Lally (2012). These include conflicts in the family, changes in the family such as death or separation, and family poverty. Family reasons are connected with economic reasons, which result in pressure on young people to leave school early and start earning, in order to support their family. The fourth of Lally's groups of common reasons for early school leaving are related to school itself. These are low levels of literacy and numeracy, leading to poor performance and consequently to low self-esteem or behavioural problems. Age differences, for example in situations in which the pupil is older or younger than their classmates, negative relations with teachers leading to bad behaviour or suspension on a regular basis, and low achievement leading to lack of motivation, are all also school-related reasons.

Measures taken against Early School Leaving are often preventative, interventional processes that compensate for missed learning, and are also relevant to pupils in compulsory education (European Commission 2010: 13). There are clear overlaps between the different measures, which tend to be effective, coordinated strategies spanning various levels of government and different areas of policy, such as social, supportive, youth-oriented and integrational. Schools need to be involved in creating such strategies, by working with teachers and parents. The quality of a school's education has a great impact on the incidence of early school leaving at that school. Improving the quality of education in both schools and at a systemic level helps all students, and at the same time reduces the risk of dropping-out (European Commission 2010: 15). As described above, early school leaving is a social phenomenon with causes that are not purely educational, ranging from the student's immediate sphere to wider society, from country to country and also within regions. Consequently, there is no single

reason for it and no single solution. But common to all reasons is the fact that employability depends strongly on the level of qualifications achieved at all educational levels, in formal and informal environments.

In 2013–2014 an education project was conducted entitled Early School Leaving and Second Chance Education (The ESSE project), financed under the Lifelong Learning Programme. The project undertook to identify examples of good practice for tackling early school leaving, whilst also highlighting the best-practice methodologies and philosophies adopted through this work. An important element of the approach taken by the ESSE project was its focus on three specific categories of early school leaving and second chance education – prevention, intervention and compensation.

Preventative strategies seek to tackle the problem before the first symptoms are visible. They look at pre-conditions for successful schooling and the design of education and training systems. Examples of preventive good practice identified by the ESSE project are those created locally, in the communities and schools. In many cases, the projects are based on schools and education authorities working together, and social services with the parents or families of the early school leavers. All age groups are at risk of early school leaving, not only children in primary schools but also teens in high school and often also adults in adult education. Apart from early school leavers and their parents, the project identified examples of ESL prevention good-practice for teachers and trainers working with at-risk youths.

Intervention strategies aim to avoid ESL altogether by improving the quality of education and training and providing targeted support to pupils or groups of pupils at risk. These include early school leavers with immigrant backgrounds in economically and socially deprived areas, and pupils with disabilities or disorders. The methodology of most projects to prevent ESL is based on a transition plan between primary school and secondary school, in order to ensure educational continuity. Some intervention strategies are built on early detection of the support needed for learning. In most cases, intervention projects are designed to identify the difficulties young people face, and devise supportive strategies that enable learners to re-engage with their education and improve their academic performance.

Compensatory strategies focus on creating opportunities for those who have left their education or training prematurely, but who later in life still want to gain their qualifications. The aim is to reintegrate them into formal and informal education. The methodology of compensatory projects is based on the idea of re-integration to formal education. Similarly to preventative measures, good-practice examples involve cooperation between schools and municipal social services.

Early school leavers are much more likely to come from families with a low socio-economic status and low household income. In particular, those with unemployed parents, parents with a low level of education themselves and parents with low involvement in their children's education are all increasingly giving up education prematurely (OECD 2012; European Parliament 2011; Eurydice

and Cedefop Report 2014). Low socio-economic status refers to families living in 'disadvantaged areas' with high unemployment, or in remote areas and small cities (compared to medium-sized or large cities), which all increase the chance of becoming an early leaver (Eurofound 2012). Another factor contributing to early school leaving is gender. Male students are over-represented amongst early leavers in general education, and both international and national research confirms that male students are more likely to be early leavers than female students (Eurydice and Cedefop Report 2014).

Apart from low socio-economic status and gender, migration is another factor that contributes to early school leaving. Because there are different definitions of immigrant pupils between European countries, it is difficult to present reliable figures. However, for the purpose of giving a general overview, the figures presented in the Eurydice and Cedefop Report (2014) clearly show how important a factor the migrant or minority student's background is in early school leaving in Europe, and how early school leavers born abroad are largely over-represented among the early leavers in many European countries. The data in Figure 1 represents the country of birth of early school leavers: those born abroad (defined as foreign-born) and those born in their country of residence (defined as native-born). However, much of the literature discussed here considers students' ethnic origin, rather than their country of birth (Eurydice and Cedefop Report 2014: 38–39).

The main impacts on the educational attainment of migrants with low socio-economic status is a lack of parental support and insufficient skill in the language of instruction (European Commission 2013a). Other issues are insufficient attention to the needs of migrant pupils, reflected in teaching methods, followed by ethnic discrimination that in some educational institutions can further impede the students' chances of success (Luciak 2004). In consequence, a lack of educational support for pupils with migrant or minority backgrounds can lead to educational disadvantages and potential risk of early leaving.

A study of the educational support given to newly-arrived migrant children (European Commission 2013), emphasized the need to improve, on a European level, the possibility of monitoring European education support policies for native and different groups of immigrant students, prioritizing the recommendations for immigrant inclusivity policies. On a national level it is essential to ensure equal opportunities, which is vital for integrating immigrants into formal education. Initial language barriers and a lack of prior schooling prevent immigrants from succeeding in their new school, and this leads to early school leaving. Another recommendation is giving schools and municipalities a reasonable level of autonomy, so that they can better address the specificities of their local needs. In this way, schools can quickly and effectively adapt to local challenges and conditions. A crucial factor in immigrant students participating and performing well in school is proficiency with the host language. Therefore, language support should have an important place in migrant education policy. Beyond language support, it is important to highlight several other pedagogical and organizational

strategies that are particularly relevant to improving teaching and learning in socially, culturally and linguistically diverse schools. Finally, it is important for governments to develop a comprehensive system of monitoring and evaluation of implemented policies and the achievements of migrant students (European Commission 2013). In general, it is believed that ICT can empower both teachers and learners. However, there are currently very limited data to support this belief, and so the positive impact of ICT use in education as well as ICT as a tool for prevention of social exclusion has not been proven. The impact of ICT use on pupils' educational achievement remains difficult to measure, and open to much reasonable debate.

2.4. Supporting the educational attainment of youths – recommendations for policy and practice

There is no single definition of Early School Leaving in Europe, as there are no unified best-practice models for reducing early school leaving in Europe. At the EU level, ESL rates are defined by the proportion of the population aged 18–24 with a lower-secondary education or less, who are no longer in education or training. Different EU member states define ESL in different ways. While the reasons for early school leaving are highly individualised, ESL as a social phenomenon follows certain patterns. Early school leavers in general come from poor, socially disadvantaged and/or low education backgrounds, and disadvantaged minorities with migrant backgrounds belong to vulnerable groups. The effects of dropping out of school on the individual and social levels are multiple and widely studied. Leaving the education and training system without reaching a certain level of qualification strongly limits an individual's range of life chances. In terms of professional careers, it leads to integration in less-qualified employment segments characterized by low pay, a disproportionally high risk of precariousness and unemployment, and weak mobility prospects. Dropping out of school also inhibits full participation in community life, either directly – due to deficits in interpretation and expression skills, speech organization, critical capacity, etc – or indirectly, through a self-image of precariousness and low income in a society in which employment and consumption are central elements of identity. In summary, leaving school early imparts disproportionally higher risks of poverty and social exclusion throughout an individual's life. Strategies for reducing ESL should be comprehensive and include prevention, intervention and compensation measures. They need to be employed both in and out of schools. This is why two-level recommendations can be drawn based on the findings in the preceding chapter, and applied at the school level (teachers and other didactics staff, head teachers, etc), and within educational authorities (staff from immigrant offices and employees from other authorities who can provide support to young immigrants). It is important to stress the universal nature of

the recommendations, and that their implementation would improve the general educational situation. This would benefit not only early school leavers, but also the entire young population of Europe.

Recommendations at the school level:
- It is essential to determine the needs of students at risk of ESL in the school. Knowing these, measures should be taken that reflect possibilities for developing and supporting motivation and engagement in the education of those students.
- Schools should ensure that students feel their individual strengths and abilities are recognized.
- Measures need to support not only the students at risk of ESL, but the teachers and head teachers too. Education staff should be informed about the extent of ESL, and the prevention, intervention and compensation measures available to them. Teachers should be equipped with the skills to provide pupils with the assistance they need, and schools need to be supplied with the resources to support those at risk of ESL. School headmasters needs to envision a whole-school approach and be open to supporting extra-curricular activities.
- It is essential to work with the parents (family) of early school leavers. Training sessions are recommended on how to encourage and motivate young people at home to aim high educationally.
- Youth immigrants are over-represented among early school leavers in Europe and are recognized as the main target of ESL prevention. Ensuring equal opportunities for those at risk of ESL is essential. The crucial factor in immigrant students' engagement and performance in school is language proficiency. Assuring different forms of language support in school is important. Beyond language support, it is important to highlight several other pedagogical and organizational strategies that are particularly relevant to improving teaching and learning in socially, culturally and linguistically diverse schools.
- It is believed that specific use of ICT can have positive effects on student achievement when used appropriately to complement a teacher's existing pedagogical philosophies. The IT equipment needs to be regularly updated and sufficient for use as a tool to help mitigate early school leaving.
- Additionally, at the school level, teachers should be trained in ICT use when working with early school leavers, and be allowed to give the students the responsibility for choosing the methods and ICT tools according to their own visions and needs.

Recommendations for educational authorities:
- Measures outside of school should be taken at the local, regional and national levels, to properly broaden the range of possibilities on offer.

- Extra-curricular activities present an opportunity for many potential early school leavers to develop a sense of identity with education, or a connection to their school.
- Second-chance education should offer an alternative way of re-engaging with education and gaining desirable qualifications for the labour market. Ideally, they would provide access to other educational pathways too.
- The consequences of early school leaving are very often social exclusion, deep and long-term damage to living conditions, health, social and economic participation. If early school leavers have immigrant backgrounds, it is important to give municipalities a level of autonomy to better address the specificities of pupils' needs.
- Use of ICT, development of curricula, pedagogical frameworks and guidelines to prevent ESL, all need to become main fields in European and national/local education policy.
- ESL prevention, intervention and compensation measures need to be included in the national social dialogue with education authorities.

Summary

Given the focus on the increasing rates of displacement around the world, bridging the divide between forced migration, the educational attainment of refugee youths and school drop-out issues in the European context, this chapter examined in general the complex challenges in terms of education for refugees and the early school leaving phenomenon in general. It also pointed to the many ways in which education can support immigrant students at risk of social exclusion. Opportunities for the success and personal development of every student in a school, with or without immigrant backgrounds, can be enhanced with relevant activities at different levels of education. European school practices are shaped by national policies and developed on the European level. Thus, the recommendations made in this chapter are not only addressed to teachers and head teachers, but also to the staff of educational authorities and policy makers. Implementation of these general recommendations would not only support prevention and interventions measures against early school leaving, but also the entire population of young students in Europe.

Chapter III

Information and communications technology – a prospective approach to education

Petr Svoboda

Introduction

The aim of this chapter is to highlight the importance of information and communication technologies as a support for, and complement to education. There are currently many questions about what influence and impact digital technology has on education, and whether its use in teaching is truly directed to educational objectives. Digital technologies consist of computers, tablets, mobile phones and the Internet, and these allow the continuous exchange of information in training and educational contexts. The young generations are using these technologies intensively. The dynamic transformation of society is reflected in the demands for changes to the education system, in which teachers must prepare pupils for professions that currently do not even exist. This fact is also reflected by the European Commission, which has issued recommendations for member countries on how to define teachers´ necessary digital competence. These recommendations were built on the previously-developed Digital Competence Framework for Citizens (DigComp), and on the definition of a digitally-functioning educational organization (DigCompOrg). The tumultuous development of digital technologies affecting most of human life spheres takes place in our 'information society', which is based on 'knowledge economy', in which ideas and knowledge are commodities. A particularly heavy impact of this is reflected in the new possibilities for industry, known as Industry 4.0, and so a new generation of digitally-literate workers must be trained for the needs of this industry. Teachers play a very important role in this, as they must prove that they have sufficient digital competence. Increasing attention is being focused on the competence required by our information society, which has led to individual schools and the entire education system introducing necessary changes within their curriculum. The aim of modern education is to develop digital literacy and computer science in pupils, to improve their competence in working with digital technologies, and to introduce new learning methods. Teachers' digital competence is thus the key to streamlining the existing processes and tasks of teaching work, as well as being a ticket to qualitatively new ways of managing the learning process for pupils and students. The change in the content of education, accompanied by expanding demands on teachers' competence, is reflected by the amount of scientific studies, research plans and scientific literature now available. The chapter also attempts to define goals and visions for the future. Barriers to integration into the teaching process of ICT tools are also

mentioned, as well as their main advantages and disadvantages. It is possible to name the positive and negative aspects of new technologies and to overcome contradictions, by seeing the positive and negative impacts that it has on the younger generations. It is especially important to show the importance of mutual learning when using the Internet, and to compare the views of both teachers and students.

3.1. Information and communications technology (ICT) in education

At present, the importance of new technologies is growing as a support for, and complement to, education. This is a response to the new needs of companies whose competitiveness requires the readiness of a population to meet industry requirements 4.0 (National Initiative Industry 4.0, MPO). Pat of the Digital Education Strategy (MŠMT 2018), is to equip everyone, regardless of their background, with the competence enabling them to live in the information society and make use of open learning opportunities throughout their lives. It is also in line with the Education Policy Strategy (Resolution CR 927, 2014), which includes the challenge of opening education to new methods and ways of learning through digital technologies, and ensuring the conditions for development of digital literacy.

Students, in particular, are at the centre of research (see, for example, the analysis of the results of the ICILS 2013 and PISA 2012 international surveys on the use of ICT in teaching and other pupil activities). Research findings in the fields of social and technical sciences have arrived at the idea of the onset of the 4th Industrial Revolution – the profound transformation of educational processes in a society whose competitiveness is based on the means, speed and quality of information processing. At the same time, profound changes in the educational functioning of schools are expected to make more use of individualized learning pathways, self-learning and peer-to-peer activities for learning pupils. New skills, often referred to as skills for the 21st century, are coming to the fore. All of these can also be deduced from the 2015 Innovating Pedagogy report. New technologies are used as a support to increase the efficiency of education, and as an expanded way of teaching for students. It can be said that with the use of ICT tools, the learning process is flexible, accessible and individual, which corresponds to needs for improving the quality of education (Svoboda, Lorenzová 2018: 6625–6629).

In general, without the inclusion of innovative didactic resources in education, schools will lose credit with modern educational institutions. Digital technology (e-technology, ICT) are meaningful parts of the modern educational reality, and help to educate talented and disabled students. Without digital technologies, students cannot be prepared for further education and application in a knowledge

society and Industry 4.0. (Svoboda 2017: 195–206). Because of technological changes and innovation, developments have been greatly accelerating. Pedagogical activities promote the formation of many different skills. Digital technologies are included in the pedagogical practice management model and the role of the company Director is crucial in introducing new technologies into the educational process. What matters most here is the role of the teacher who has digital competence, working with information and data through information and communication technologies. New trends in education are certainly oriented this way, and it is apt that we now put the digitally-trained teacher into the forefront of practice. It is necessary to use digital technology throughout the school year, and to focus on analysis of the current educational situation in the teaching of vocational subjects at secondary schools, as well as in the research in this field (ETA TACR PID: TL01000192, 2018).

3.1.1. New technologies and the current most frequently-used didactic tools

Information and communication technologies (ICT) currently affect most the human activities and disciplines, including our educational reality. Teachers are increasingly being asked to use technology in their lessons. A digitally-competent teacher (Svoboda 2017: 195–206), will achieve a good level of digital competence and pass on and develop their knowledge and skills of working with ICT. Several research projects (such as STEPS, UNESCO, ACOT, Horizon Report Europe, and the Survey of Schools: ICT in Education), as well as teaching experience, show that digital technologies and innovative didactic tools can help to improve the learning outcomes of pupils if using appropriately chosen methods and forms of teaching. New technologies and didactic tools are instruments that have the advantage of fostering collaboration and teacher-student communication among students, fostering professional development, cross-curricular links and more active engagement in learning. They offer access to different sources of information, the opportunity to work with pupils and professionals from other countries, the use of virtual laboratories and museum tours, and allow greater flexibility in education, e-learning, blended learning and personalized learning. The weaknesses in this idea include: the ICT literacy of teachers and pupils; sources of false information; limitations in the functionality of the techniques (or the total malfunctioning) of the chosen teaching methods; many sources of stimuli and associated attention; inappropriately-chosen font sizes in presentations and learning aids, and the lessening of real contact with others.

Since the teaching process can be understood as a controlled process of transferring target structures into students' consciousness, the educator's tools can be considered didactic tools, i.e. everything that helps to achieve the educational goals. In this conception, besides the material, technical basis of teaching (material didactic tools), we can also consider teaching methods

and forms of teaching and learning (non-material didactic tools) as didactical tools. Non-material tools can also become a goal in themselves (Rambousek 1991: 150–200).

The material technical basis of instruction consists, for example, of teaching aids, methodological aids, technical equipment, didactic technique, school supplies and teaching facilities. It should be noted here that most of the material didactic tools has a functional character, it can contribute to the achievement of different goals. Therefore, material didactic resources are not used in isolation, but used simultaneously with integrated multimedia systems to promote and enhance each other (Rambousek 1991: 180–220):

- *New didactic tools* – the use of new teaching aids in teaching opens up many possibilities. Digital technology uses multimedia, which helps us to integrate more sensory perceptions into the learning process. The most effective use of this is in multimedia classrooms.
- *Multimedia classrooms* – place great demands on teachers. The teacher must monitor the development of technologies and, if necessary, update the software and equipment. Conventional multimedia classroom equipment consists of:
  – a multimedia computer, notebook or tablet,
  – projector,
  – audio and video technology,
  – interactive whiteboard,
  – voting equipment,
  – reprographic devices.

ICT includes a large number of services and devices that are used to retrieve, transfer, share, process and present information in digital form. School ICT equipment can include: computers (desktops or laptops, ideally with a webcam); tablets (phablet, 2v1); digital cameras/camcorders including a tripod; storage devices (HDD, SSD, flash drive, etc); data projectors; visualizers; audio devices (speakers/headphones/microphones); DVD players; printers; voting (feedback) devices; styluses; connectable sensors (for example, temperature, oxygen, light sensors, GPS etc); remotes; resp. virtual laboratories; connectable microscopes; multimedia players for streaming video; scanners; touch screens; other digital players and smartphones; iBeacon devices (simply put, a Bluetooth device for transferring information to tablets and smartphone); special keyboards; 3D printers; virtual reality goggles; programmable kits (e.g. robotics), and networking equipment – Internet, intranet (LAN), Wi-Fi, routers and switches (Vališová, Svoboda, Andres 2016: 75–78). In addition, interactive technology can be found in multimedia classrooms – touch screens and tablets, interactive monitors, interactive whiteboards, interactive tools (eBeams), interactive tables, interactive walls, interactive mats, contactless technology and SmartTVs. In the pre-research for the current research and development project in support of applied social and humanitarian research, experimental development and innovation (ETA TACR PID: TL01000192, 2018), it was found that secondary

schools make the most use of desktops, tablets, interactive textbooks, and voting devices. Virtual reality goggles, digital assistants and interactive walls were the least-frequently used, or not at all.

3.1.2. New tools in distance education and blended learning

'New tools' are here defined as extensive resource sets for facilitating, accelerating, and processing data. Virtualization and gamification have become increasingly popular, with both seeing dynamic growth in recent years. This is reflected in the emergence of a range of tools applicable for use in education:

- *Remote laboratories*. The first remote laboratories were created as server-client applications, wherein the client programme had to be downloaded and installed, after which remote lab tasks were accessible. The contemporary concept of remote laboratory tasks is now approaching the concept of traditional laboratory tasks. These task include a description of a theory, the actual work to be done, and measurement guidelines. Written papers can also be submitted through the labs. Access to these remote laboratories is now made via web browsers (Lustig 2008).
- *Virtual laboratories with applets*, simulations, and models are emerging technologies in the natural sciences. Data is transmitted via a clipboard between the user's location and the virtual lab in both directions, so that real data can be compared with virtual data, and vice-versa, to import into real-time measuring software (Lustig 2008: 4–12).
- *E-technology parks* with remote and virtual laboratories – free Internet access is provided not only to finished laboratory tasks (including text and methodology), but also to the technological basis of their own remote tasks. It is comparable to standing at lab tables, on which the laboratory task is completely assembled, and choosing our own role (text, tasks, methodology) in the assignment.
- *New didactic resources* in teaching enable more efficient use of teaching methods and thus help more effectively achieve set goals. Students are not only reliant on perceptions of transmitted knowledge, but are offered opportunities to manipulate objects or reproductions and images, using modern technologies (Lustig 2008).
- *Hypermedia* – this term usually refers to online documents that contain links to other items of text, images, videos, music, etc. The most common examples are pages on websites on the Internet, and interactive encyclopaedias on disc (Čadílek, Konupčík 2008).
- *Virtual classroom* – an interactive web tool that distances geographic distances; this is software for mediation of communication, cooperation and exchange of experiences in meetings without the personal presence of the participants, via computers connected to the Internet, using microphones, speakers and headphones (so-called on-line access). Didactic

games can also be used here (gamification). Lectures, presentations, Q&A in writing or orally, results, notes, and other supplementary information can all be given, and even entire sessions recorded for later playback and self-study.

- *Virtual and augmented reality* – education in 3D virtual spaces. The use of 3D virtual reality and 3D multi-user virtual environments provide students and teachers with a sense of social community, and virtual social relationships. This has been made possible by the convergence of 3D virtual simulations, online computer games, and social networks. Virtual Reality (VR) allows social interaction between users through virtual avatars that meet in the virtual reality environment, where they can communicate in a manner very similar to real-world communication (including non-verbally). Game-oriented play and story-based role-playing are also possibilities in virtual spaces, which use methods of experiential learning and simulation learning. VR employs principles of connectivity and constructivism – they require the active collaboration of people in manipulating 3D virtual objects (working in groups), using virtual simulations of real professions (experimental learning, simulator). Much research suggests that in recent years there has been a growing interest in introducing AR (Augmented Reality), mixed reality and 3D models into teaching. The research has pointed to the effectiveness of augmented reality in education. This has been most widely applied in elementary schools, and has led to the improvement of learning outcomes. 95% of pupils approached augmented reality tools positively, stating that they helped them better remember, learn and understand new subjects (Horizon Report 2016).
- *Personal assistants* (Virtual Assistant, ChatBot, Digital Assistant, using artificial intelligence (AI)). These are programmes that use AI to generate dialogue with users, completely autonomously. ChatBot has a database of predefined responses, and learns based on its interactions and artificial intelligence. ChatBots are useful in education, for example, when enrolling and registering for educational events, and when collecting input questionnaires. AI communications can also help draw students into online education, especially MOOC (Massive Open Online Courses) courses, where it is difficult for the large numbers of participants to ask the teacher a question.
- *OzoBots.* Current trends in teaching emphasize the development of computer science thinking. The first steps are most often realized through specialized miniature robots. These are interactive toys that develop creativity and logical thinking. They are a didactic tool that represent a clear path toward programming and robotics. In the classroom, students draw different paths that the robots (Ozobots, mBots) follow, and add extra commands to modify their behaviour.

These new tools in teaching enable more effective use of existing teaching methods and thus achieve set goals more effectively. Students are not only

dependent on the perception of transmitted knowledge, but also are offered the opportunity to manipulate objects or reproductions within virtual environments. The most effective use of this technology is within the multimedia classroom.

3.1.3. Advantages and barriers in the use of new technologies in education

The use of new technologies in education, teaching practice, continuing education, and lifelong learning offers several advantages, including:

- *As teaching aids* – new technologies such as art and design editors can be used to create production programmes, knowledge tests and thought maps, photo and video processing, animations, presentations, image documents, interactive models and multimedia educational materials, and distribute them to students on DVDs and websites.
- *Archival possibilities* – teachers don't have to keep documents in paper form; their lesson plans and classroom materials can be kept easily and cheaply in digital form, updating information continuously, including with references to other electronic or printed resources. Learning Management Systems and cloud services (see Section 3.4.3) can be used for this.
- *Extension of teaching* – with new technologies in the classroom, it is possible to meet the individual needs of students, at the same time as everyone actively participating in the work, adding new data, doing tasks, working with different models and changing their parameters, tracking experiments and so on. This promotes diversity, and especially clarity, in explaining the subject, including with simulation and modelling.
- *Communication and interaction between all participants and actors in education* – targeted cooperative teaching allows presentation of school work and projects on web pages, and e-publishing in online school magazines. Videoconferencing facilitates meetings between students and experts outside the school. Interactive tutorials can be used to practice, test, or verify knowledge and skills. Educated parents can have access to their children via school websites. LipDubs can be made (a combination of lip synching and audio dubbing to make music videos).
- *Learning management* – all obtainable information can be processed by the teachers, analysed and stored in electronic databases, for creation of subsequent lesson planning in consideration of the results of both individuals and the whole class. Teachers can interact with each other and their school management to share all the data, and consult.
- *Self-education and personal development for teachers* – existing communication programmes, on-line courses, webinars, MOOC courses and combinations thereof offer teachers a variety of forms of personal and professional growth, as well as collaborative opportunities in their professional communities (creating Personal Learning Environment – PLE).

- *Improving the learning of students and improving their results* – this is still the subject of discussion and some expectation, but experts agree that new technology enriches the curriculum and helps lay the foundations for learning that links the real world (institutions, authorities), with the school.
- *Troubleshooters, Creative Support and Presentation Skills Toolkit* – modern didactic means and technologies provide students with the opportunity to research, discover, experiment or simulate a variety of situations and authentic environments; at the same time, they can create their own presentations and multimedia learning media, and publish joint results on the school website, or report on public projects being run at school. This simultaneously combines the knowledge of several subjects, as well as several kinds of programmes and a range of technologies.

We can now state that the advantages of new technologies outweigh the disadvantages. The disadvantages of new technologies are, for example, small displays, limited battery life, some mobile devices not being suited to extensive document editing, various technical specifications, and compatibility between devices. New technologies can effectively help and support educational processes, but can – on the contrary – be complicated, unclear and for some even useless and dangerous. Such barriers to the use of new technologies in education are associated with dynamic developments in the world of technology, some of which render digital and multimedia tools out of date, requiring their replacement with more recent tools. These are then sometimes incompatible with currently saved files and work.

According to professional publications, the weaknesses of new technologies include different forms of addiction, the occurrence of negative social effects, digital dementia, increased child aggression and new forms of social pathology, such as cyberbullying. K. Šeďová i J. Zounek (2008) enumerated the barriers to smooth integration of ICT into the education sector, which exist at the 'input' level of teachers: a lack of ICT skills; lack of teacher motivation and confidence with ICT use, and a lack of opportunities to further develop their existing skills in ICT.

Barriers at the school level include missing or poor quality technological infrastructure; obsolete or poorly maintained hardware; a lack of appropriate training programmes; limited access to ICT; limited experience with online projects or project-oriented learning, and insufficient integration of ICT into the functioning of the school. Barriers at the state level of school authorities include the rigid structure of traditional school systems, and a restrictive curriculum or educational content.

From the point of view both of pedagogues and ICT experts, new technologies should be perceived as tools for use in certain spheres of teaching. Even so, in other areas of teaching they can be less efficient than traditional methods, and sometimes even counter-productive. School children and students are acquainted with modern technology at home, and many of them also with computers (Vališová 2005). Children prefer playing computer games to educational programmes, and the developed world is experiencing huge development,

production and sale of computer games. If a child plays massively excessive amounts of computer games or sits all day and night watching YouTube, it results in a lack of exercise, restricted creativity and mental and psychical weakness. School should have many other means of balancing and overcoming the potentially undesirable aspects of excessive use. As for the educational function of ICT, it also changes the social task of actual books, and cannot be replaced in any case (Vališová, Svoboda, Andres 2016).

3.1.4. Extension of new technologies in education

According to a survey undertaken as part of the Professionalization of Key Competence of School and School Management at Charles University project (CŠM PedF UK 2013), the barriers to dissemination of new technologies in education are the lack of school equipment (30%); a lack of student interest (20%), and distrust of new and untested practices 35%). Only 15% of respondents believe that the extension of new technologies to education is barrier-free. In detail, these barriers were described as follows:

• *Barrier 1 – insufficient school equipment*
Teachers do not include new technologies in their lesson plans due to the lack of material facilities owned by schools; limited network options within the school building; having to find suitable software for teaching; their reluctance to actually use these resources, and financial restrictions on their acquisition and operation.

• *Barrier 2 – the disinterest of students, teachers*
The second main reason teachers do not incorporate new technologies into their teaching is that some students still prefer to search for information in books, rather than using digital technology. For the teachers surveyed, this is primarily about their older adult students, whose lack of interest stems from the fact that they find technology complicated and need more time to master it. The opinion that in some areas of teaching it is not suitable for in teaching was also expressed. One reason for this barrier is that students prefer to use technology for entertainment, rather than studying. Use of ICT tools is therefore a distraction from the core of the teaching.

• *Barrier 3 – distrust of new and untested practices*
Teachers are also reluctant to bring new technologies into their classrooms because some have a lack of confidence in new things, excessive fear of untested methods, and wariness of the financial risks. Ignorance of the possibilities and a lack of experience are also reasons for not including ICT tool use in lesson plans.
These statements indicate that the main obstacles to the use and subsequent expansion of new technologies into schools, classrooms and learning

practices are financial concerns and mistrust in the new, as well as a lack of infor-mation or awareness. It is clear that the personality of the teacher, their interest and willingness to embrace digital technologies to increase the efficiency and attractiveness of teaching, all play a significant role here.

If we look to the future to develop new technologies that are appropriate and meaningful to our educational reality now (Gartner.com 2015) we can find a huge list of appropriate technologies: m-learning; personal learning environ-ments; MOOC; new distant learning tools; wikis; blogs; RSS feeds; use of Cre-ative Commons; cloud-based sharing of electronic learning support; u-learn-ing; t-learning; educasting; educatching; virtual reality; augmented reality; artificial intelligence; robotization; gamming; programming; seamless learning; social networks; omnipresent smart phones and tablets, and an overall move to mobile technology. New skills, often referred to as 'skills for the 21st century', are becoming a focus of interest. This can be seen from the Innovating Pedagogy report (Innovating Pedagogy 2013–2016).
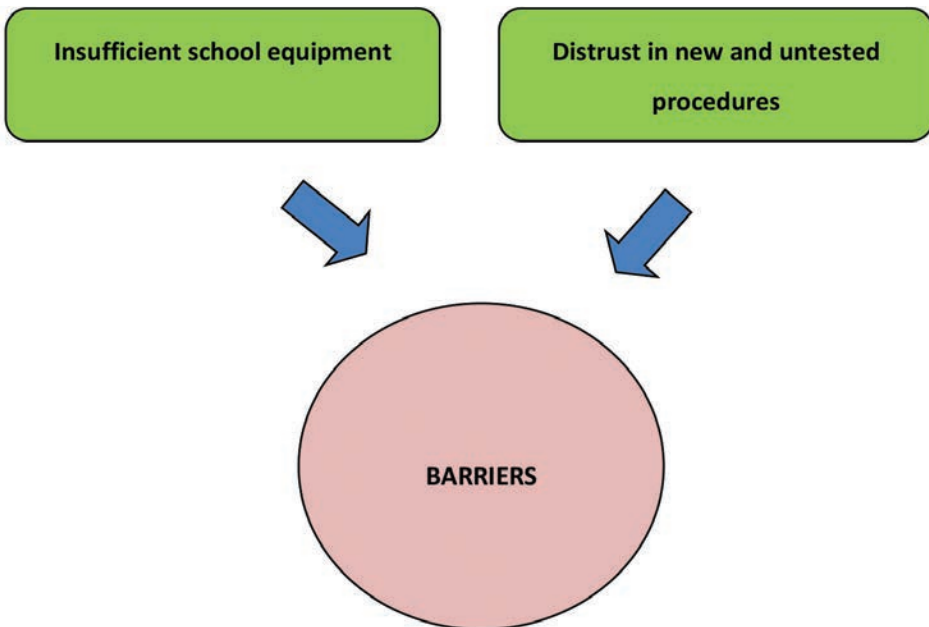
Figure 4. Selected barriers
Source: original study

Other barriers include ethical risks, such as about student privacy, protec-tion against cheating on tests, and legislative barriers. The opposite problems are teachers and schools who, for various reasons, don't use technology at all. There is a so-called digital divide between well-equipped schools that make effective use of the opportunities new technologies represent, and those that

do not have these technologies, or cannot adequately handle them (Svoboda, Lorenzová 2018). ICT tools can be welcomed by teachers with an enthusiast's devotion, engaging them accordingly in their teaching. Some schools might also consider quality technological equipment as a marketing advantage in the fight for pupils and students.

The differences between digital natives and digital immigrants can also be barriers. Digital natives are defined as 'generation Z' (Prensky 2001), i.e. people born after 1990, have all used digital technologies such as mobile phones, the Internet, MP3 players and videogame consoles all their lives. The second term, digital immigrant, applies to people who grew up in the analogue world and are thus connected with the digital environment to a lesser extent than digital natives. As Gartner says, "we live in mobile times" (Gartner.com 2015). Computers, tablets, smartphones and the Internet are now an integral part of everyday life. There is no doubt that the use of digital technologies and didactic tools have a significant effect on our social interactions.

3.2. Digital literacy and its development

Information and communication technologies are increasingly required for both normal, everyday life, as well as work life. The ability to work with a computer is a marginal matter in today's concept of digital literacy – technology is constantly evolving and the requirements for digital literacy are increasing with it.

The concept of digital literacy emerged together with the growing trends in digital technology in our society. Digital literacy influences the quality of our personal life, while the internet has a great impact on our social life. With the advent of the Internet, our points of social contact have increased, and become much more diverse. For example, the combination of mobile phones and the Internet creates new forms of family cohesiveness, based on greater mutual contact, better co-ordination of mutual activities, and sharing of topics and experiences, photos and other information. The development of digital literacy is therefore important for parents and grandparents in today's world, in which communication between children and grandchildren has largely moved to the Internet.

In this chapter, the term 'digital technology' is used synonymously with 'information and communication technology (ICT)', which is gradually replacing the use of 'digital technology' in education. In that context, it is a wide range of resources, tools, environments, and computer and communication practices that are used to support learning, communication, collaboration, expression and creation (MŠMT 2018). Digital literacy is nowadays more and more needed, for both normal everyday life and working life. Previous beliefs about what digital literacy represents are now obsolete, as the very ability to work with a computer is now a marginal matter in today's concept of digital literacy. Technology is constantly moving forwards and evolving, thereby enhancing the demands on

digitally literate people, who nowadays need to manage the basics of programming and the ability to use digital technology in everyday life (MŠMT 2018). More and more professionals are convinced that in today's technologically-sophisticated life, they can no longer remain at the level of a simple user of tools created by someone else. For meaningful use in everyday life, a person should understand the principles of technology and be able to influence, modify, and shape their digital environment (to a certain extent).

According to (Průcha 2009), digital literacy means the ability to control various kinds of communication mediums, and numerical actions, to use information in multiple life situations. Digital literacy is a complicated, complex, changing phenomenon. Its content and definition responds to specific social contexts, reflects the evolution of conditions and the changing needs of a society, its culture, language and standards. In accordance with the definition of the concept of digital literacy approved by UNESCO (MPSV 2017; MŠMT 2018), digital literacy is the set of skills necessary to identify, understand, interpret, create, communicate and usefully and safely use digital technologies (their technical properties and content), to improve one's quality of life and surroundings. For example, for the purpose of both working and personal self-realization, by developing personal potential and maintaining or increasing participation in society.

As stated in (MŠMT 2018), digital literacy is understood as being a key competence consisting of a set of knowledge, skills, abilities, attitudes and values that an individual needs to use digital technologies and digital media for activities such as building; task handling; communication; information handling; problem solving; collaboration; content creation and sharing, and knowledge building. The individual applies these at work and in leisure, social and civic activities, in their learning and in their personal growth. Brdička stated that digital literacy consists of seven components: information literacy; media literacy; digital working environment; communication and cooperation; creating your own digital identity; ICT literacy, and the ability to learn (Brdička 2012).

The British company FutureLab (2010) defines eight components of digital literacy:

- *functional skills* – functional literacy and functional skills;
- *creativity* – the ability to create and understand digital content. That is, the process of making or receiving information itself. Creative thinking and work include intuition, inner motivation and creativity in the production of ideas, risk management and readiness to change;
- *critical thinking and evaluation* – critical thinking allows use of intellectual ability to investigate, analyse and process information and data for use further evaluating information and reaching conclusions. Critical thinking is important in relation to other elements of digital literacy, such as the search for information or the choice of technical means;
- *cultural and social understanding* – processes supporting the creation, understanding and sharing of opinions or ideas through ICT;

- *collaboration* – the ability to interact with other people, and to actively and responsibly participate in group work. Sharing one's own knowledge, following agreed rules, tracking group goals, and sharing common tasks;
- *the ability to find and select information* – the ability to find, recognize and select valid or important information needed for a given situation. Evaluate different data sources and information channels, pass on and process information, work with information databases, use advanced technology;
- *effective communication* – the ability to communicate actively, including the ability to present well, and the ability to listen and argue well;
- *e-safety* – safe work with ICT. To think about the suitability of digital content in relation to its age category and the acceptable use of technology. Awareness of virus protection, cyberbullying, and copyrights and protected content.

According to the American Book Association (Ala-Mutka 2011 and District Dispatch 2013), digital literacy is the ability to use information and communication technologies to search, validate, create and transmit information that requires both cognitive and technical skills. It has also been noted (Martin 2008) that digital literacy is the ability to successfully perform digital activities (the ability to effectively work with digital technology) in different life situations, which can include work, learning, leisure time and other aspects of everyday life. Digital literacy can be understood as a set of digital skills (knowledge, competence, attitudes, values) that an individual needs for safe, self-confident, critical and creative use of digital technologies at work, learning, leisure time and engaging in social life (Ferrari 2012). Digital competence is conceived as a set of knowledge, skills and attitudes, including the appropriate capabilities, strategies and values necessary for the use of information and communication technologies and digital media to accomplish tasks, solve problems, communicate, manage information, collaborate, create and share content, and to do so knowingly, effectively, appropriately, critically, creatively, autonomously, flexibly, ethically and thoughtfully. Digital literacy is directly related to digital competence (Svoboda 2018). Digital competence (which is described in more detail in the following chapter) is the sure and critical use of Information Society Technologies (IST) at work, in leisure and in communications. It builds on the core ICT skills (European Parliament and Council 2006): *Using computers to retrieve, evaluate, store, create and exchange information, and communicate and collaborate across networks through the Internet*. Computers, tablets, smartphones, electronic communications and the Internet are an integral part of everyday life, and so it is necessary to state that they correspond with digital literacy.

Today's students use digital technologies as a matter of course, and perceive them as a natural part of their lives. This is also how it should be in schools. The use of digital technologies for learning represents a challenge, as there are often other uses than those to which students are accustomed in an out-of-school environment. Different studies, for example (DigComp 2013), show that many students have not worked with electronic textbooks and educational

games and programmes. A proportion of students also have not used multimedia tools, Learning Management Systems (LMS – software for managing and tracking educational courses etc), or any other kinds of electronic learning support. In this case, there are many students in Europe. Teachers are reluctant to incorporate new technologies into their teaching because they have a lack of confidence in new technological innovations, an excessive fear of the untested, and financial concerns. Lack of experience is another reason for not including ICT tools in educational programmes. Information societies are particularly widespread in the Nordic countries of Europe, such as Norway, Denmark and Finland. Below the European Union's average are the post-communist states of Europe, and the countries of southern Europe, such as Italy, Greece and Portugal (MPSV 2017). The International Computer and Information Literacy Study (ICILS 2013), is an international comparative project focusing on mapping the real skills and abilities of pupils in the field of computer literacy and information literacy. Altogether, 19 European countries were involved in the ICILS study.

Family and family background have a major impact on a student's success at school and in life, in terms of integrating digital technologies into education. Some parents underestimate their importance in education, for example due to a lack of insight into the possibilities of digital technologies and their own inadequate competence in this field (Altmanová 2010). Parents might fear excessive use of digital technologies in teaching and the negative impact of using digital technologies on their children. Therefore, it is necessary to work with parents and explain to them why it is necessary to develop digital literacy and student thinking; to show them the educational potential of digital technologies (Altmanová 2010), including possible weaknesses and negative aspects. Digital technology has become an integral part of the everyday life of a large proportion of the population of the advanced world (Altmanová 2010). In turn, their development has changed the availability of information, and thus ways of viewing information, how to access it and how to deal with it. Today's youth are growing up in an environment in which information and digital technologies are ubiquitous, and working with them is seen by young people as a completely natural part of life. But it is necessary to link school education and the out-of-school environment. The school as an institution isolated from an external, digital or online environment will not be eligible for survival in the 21st century (Altmanová 2010).

The availability of information and the expansion of digital technologies has created a situation in which the role of the teacher is changing from provider of knowledge to consultant, or creator of a suitable learning environment (such as with electronic learning support). Everybody's individual education and learning is important. The development of digital literacy is conditioned by the possibility of permanent physical access to digital technologies, and so digital literacy needs to be developed.

Digital literacy can be developed in three ways (MŠMT 2018): informal learning at the individual level (e.g. trial and error); learning through informal communities (friends, family, interest clubs, libraries, online communities),

and formal education (manuals, school lessons, official courses). Digital literacy is a prerequisite for effective human performance in the information society, the digital age, and Industry 4.0. In general, digital literacy cannot be categorized as a specific literacy, the lack of which can be circumvented. Without this literacy, today's society clearly cannot contribute to its own development.

3.3. Digital technology in education

3.3.1. Digital technology in pedagogical activities

As discussed in the chapter on digital literacy, the term 'digital technology' is synonymous with the term 'information and communication technology', which it is gradually replacing in educational circles. In the context of education, it includes a wide range of resources, tools, environments, and computer and communication practices that are used to support learning, communication, collaboration, expression and creation (MŠMT 2018). Digital technologies have undergone rapid development in recent years, and this has implications for education too, about which many people are sure to ask questions. Why is it necessary to deal with digital competence? What are the reasons for making use of digital literacy? What are the preconditions for using digital technologies? Are there barriers affecting the spread of new technologies in education? What are the perspectives for the future? These questions relate to the possibilities of using mobile devices and mobile technology (hereinafter 'm-technology') in the educational process, and effective school management through digital technologies. Because of technological change and innovation, development has been greatly accelerated. Management activity involves promotion of the formation of many skills (Svoboda 2016), becomes more flexible and fulfils the needs of effective management of school organizations. Digital technologies are included in pedagogical practice management models, in which the role of Director is crucial to introducing new technologies into the educational process. Even now, it is necessary to use digital technology throughout the school year in organizing and managing the school. The assumption is that school staff are already inadvertently using current technologies (Svoboda 2016): to prepare for meetings; to manage pedagogical colleagues remotely; to hold electronic conferences; for self-study; for presentations; to create classroom schedules; to organize and run the school using appropriate software (e.g. school information systems); to use cloud services; interactive technologies; advanced didactic resources in teaching; e-learning; m-learning, and internet telephony. Therefore, the necessary assumption is that school staff are digitally literate.

Part of the dynamic development of digital technology is linked to the demand for systematic changes in its use in teaching, and in school processes. The requirements for the managerial role of school heads have changed (Flanagan, Jacobsen 2003), with their decision-making processes being influenced by digital

technology in the allocation of time and available resources. There is a certain mismatch between the penetration of digital technology into various aspects of society (critical aspects of education), and the considerable uncertainty among teachers about how best to actually use it. Relations between new technologies and management issues in education have also been addressed (Webber 2003). From the point of view of the effective use of digital technologies, the provision of educational courses in school and teacher management plays an important role in enabling the continuous increasing of skill with digital technology, within training courses for teachers (Flanagan, Jacobsen 2003). It should be also noted that new technologies encourage school heads and teachers to change how they plan, acquire and evaluate the continuing education process (Webber 2003). It is important to look at the relationship between new technologies and leadership in the field of education (Webber 2003). How do they change management prerequisites? How do they support decentralized leadership? How do they make the education sector more democratic? How does this affect resource allocation? How does it support the development of new forms of leadership? According to the OECD (OECD 2015), a manager must be able to manage actual change (when necessary), manage the allocation of material resources and control the flow of ideas and knowledge (or 'knowledge management'), plan their own time (time management), and maintain their team.

Without the inclusion of digital technologies in education, schools can lose their accreditation as modern educational institutions, which this is one of the best reasons for their use (Dixon 2013). Without digital technologies, students also cannot be prepared for further education, Education 4.0 and jobs in a knowledge society and Industry 4.0. Digital technologies help to: educate talented and disabled students; evaluate students; enable parents to interact with the school; get acquainted with school documents/school rules; school annual reports; ICT plans; school council; admissions; student activities; projects; competitions; offers of courses; tenders; and school organizations. Students and parents have the opportunity to watch online classifications on school websites, see the results of competitions and educational Olympiads, get educational counselling, and participate in workshops, etc. In some schools, students use their own mobile devices with an internet connection. Parents' awareness of new methods and forms of teaching at the school is a considerable benefit at present, attracting interest in schools and education. Digital competence corresponds to lifelong skills and must be considered as being essential in the field of teacher training (Brdička 2012). A school worker who masters digital competence is effectively working with information and data, by using modern information and communication technologies.

Reasons for a manager to gain well-developed digital competence (Vymětal, Diačiková, Váchová 2005) include:

- innovative teaching practices, examples of good practice, motivation;
- the importance of digital technologies for management activity, the benefits of change and school development;
- management skills – for example, change management, knowledge management, implementation management, time management.

3.3.2. Application of digital technology in education

Devices (notebooks, tablets, smartphones, data projectors, interactive whiteboards, voting equipment, microphones, headphones) can all be used by teachers to apply digital technology to teaching (Svoboda 2015a; Bořecká 2015). They can be used in the following ways:
- to create learning materials using the software that comes with interactive whiteboards, or with a presentation editor (e.g. PowerPoint);
- as a video conference program with students from another school or with an expert who can help explain the student's current subjects, using online discussion;
- create with the students a class blog or student blog;
- as an app to add comments (both text and video) to a document;
- as a class content-sharing tool, together with the students to create a story using software;
- as a computer as a screen-casting tool (screen capture with text or video instructions). The students themselves can create documents for sharing (for example, for verifying knowledge and skills), or digital recordings;
- students can explore their own presentations and multimedia documents;
- as a school information system or learning management system, for the management of teaching activities;
- students create animations, comics or videos, create a website together with students;
- use voting facilities for voting or evaluation;
- use a whiteboard application to present pupils' knowledge and skills;
- create video, animation, and comics along with the students, record group discussions, create electronic publications, conduct student surveys and show online evaluations;
- use the information projection tool for pupils' mobile devices, and use students' tablets to vote.

Teachers can find innovative ways of learning through the use of digital technologies:
- virtual representations, analysis of learning outcomes;
- video coaching, video mentoring;
- online communities (professional associations);
- personal learning environments (PLE), open, free educational resources;
- social networks and their use in education;
- gaming, programming of robotic devices, virtual reality, augmented reality, ChatBot, snowball method.

How can the educational potential of digital technology be used? For example, the educational potential of digital technologies can be exploited by teachers through online communication, on-line tools and learning resources. Programmes can be used to support learning, collaboration, sharing and verification of knowledge, by:

- sharing materials, creating lessons, classroom management, collabora-tion, quizzes, evaluation;
- online document creation and the possibility of sharing;
- photo sharing, editing and communication;
- communication, online discussion, blog sharing, screen sharing, file transfer;
- sharing lessons, media and other materials, promoting collaboration, organizing and managing the learning process;
- sharing found online resources, supporting projects, website creation;
- a tool for evaluating, sharing quizzes;
- creating presentations, uploading existing ones and editing, sharing;
- streaming, showing presentations to pupils, sharing, materials library, quizzes;
- create a common video channel with the pupils, sharing videos;
- for quizzes and ratings, creation of QR codes.

Furthermore, they can also be used for (Svoboda 2015a; Bořecká 2015):
- *challenge-based learning* – focusing on the use of digital technologies to solve global problems. The idea for these activities contributes to the activities themselves, which are expressed in one word, e.g. 'democracy'. Pupils ask questions and develop the idea. They propose solutions to find appropriate sources of information. The proposed solutions can then be implemented, evaluated, documented, etc.;
- *flipped classrooms* – students first get acquainted with a new curriculum at home through e-learning, m-learning, and online conferences. The student advances at their own pace, and records their comments and ideas. The teacher shows them a short video or animation, with commentary, in advance. The teacher then responds to student questions and leads them to a deeper understanding of the subject. This is known as 'blended learning';
- *cloud computing* – provides online data spaces and applications usable in education. The most suitable use is for blended learning, reversing teach-ing and project teaching. These methods support creativity, collaboration and productivity;
- *using social networks* – teachers, students, and parents can share pho-tos, videos, stories and posts, which can also be used to remind students of tasks and solutions. Social networks can be a useful tool for feedback and possible suggestions for improvement or collaboration, as they allow two-way dialogue between pupils, parents, teachers and organizations;
- *gamification* – learning based on making games out of other systems. Computer and video games (predominantly online games), allow game-play to be used as a natural way of gaining competence, developing col-laboration, communication, creativity, productivity, and authentic learning. They develop logical thinking, language teaching, mathematics and the sciences. They help in teaching pupils with special educational needs and disabilities. We are here mostly talking about games focused on building

– simulators, city management, programming of robotic toys and devices, and the internet of things (IOT);

- *learning resources* – digital learning materials are, in fact, a specific designation of 'learning objects' – Learning Objects and Learning Resources are terms used in foreign pedagogical literature. The most common digital teaching materials are worksheets, presentations, tests, videos, and audio samples, all of which can be used directly in the classroom.

Other possibilities for the use of digital technologies in teaching (Bořecká 2014); include:

- Nature – for example, the teacher will play a video focused on explaining the principle of photosynthesis. Pupils make notes. After watching the video, the teacher leads the pupils through a discussion to determine the main facts they gleaned.
- Mathematics – complemented by activities that support personalized learning. For example, students are individually taught to find out where a triangle can be constructed (perhaps with a visual aid). At the end of the activity, the students can try triangle construction using a suitable application on their mobile devices.
- Natural sciences – the teacher divides the students into groups (ideally up to 3 pupils). The students can use the internet to instantly make notes to a shared file. Students first agree on a specific subject, then together create a skeleton of a document or video (note that the teacher can add them to their conversation at any time, and if appropriate, draw attention to possible problems in their work). After creating their work, they present it to their classmates.
- Foreign languages – the teacher will divide the students into pairs. They then prepare a conversation on the subject, for example in the form of a video or an audio recording. They could create an interview video with various photos, such as their favourite sports and music groups. It could also be a situational dialogue, for example in a restaurant, a store, or with a doctor. This activity can be easily modified for other subjects as well. For example, in natural history, pupils can use human skeletons and on the basis of questions asked, show different bones, or explain the principles of the human body's functioning. Multimedia (especially video and animation) is thus a simple guide for students, and are often used in reversed learning or e-learning (e.g. the Khan Academy). With today's technology it is advisable for pupils to familiarize themselves with internet security, cyberbullying and ecological behaviour through computer and video games. Activation methods here include the heuristic and problematic methods (in which a question or problem has to be solved by the student, who is given only the basic knowledge and skills necessary to find the answer).
- Digital story – one option here for developing students' presentation skills is to get them to create a digital story, such as about an experience they've

had. If teachers can get in touch with a school abroad, or at least a good translator, their work can be translated into a foreign language, thus developing their ability to communicate in a foreign language. Before starting the project, it is advisable for pupils to brainstorm and identify what their digital stories should focus on. In the next step, it is advisable for pupils to find websites with good examples of digital stories. In this way, they will also become acquainted with how to self-evaluate their work. As a homework lesson, the students will then actually create their digital story. Subsequently, they format their story according to a template in a video editor, adding their own video clips and images to it (under appropriate licenses, e.g. creative commons). Using the video editing software, they finish their digital story with background music, or subtitles in a foreign language. The finished 'story' is then exported and shared with classmates.

3.3.3. Digital competence

Communication in schools was and is traditionally focused on direct verbal and non-verbal contact between people. Now, however, electronic communications have penetrated the educational space. Some of the most popular include: Email; Chat; ICQ; Skype; WhatsApp; Viber; LinkedIn; Facebook; Messenger; MOOC; Cloud; LMS; Webinars, Educasting and Podcasting. While these all represent effective support for people in education, it is up to the teachers and supervisors of today's schools to be aware of the possibilities of digital technologies and to use them to increase the effectiveness of the teaching process and management activities. A digitally competent teacher has an overview of hardware and software equipment in their school and can learn how to use the educational potential of digital technologies in teaching (the previous section describes how they might exploit the potential of digital technologies). As such, now more than ever it is desirable to address certain aspects of the educational environment (Svoboda 2017):

- comparison of traditional communication in class with current means of electronic communication (e.g. E-mail, Chat, social networks, internet telephony, Learning Management Systems, MOOC, Webinars, Educasting);
- use of modern didactic means (e.g. multimedia classrooms, interactive whiteboards, visualizers, hypermedia, interactive walls, interactive tables, interactive carpets);
- use of new objects in distance education (remote laboratories, virtual laboratories, e-tech parks with remote and virtual laboratories);
- use of 'e-technologies', digital technologies, m-technologies (high motivation).

In this author's opinion, considering the use of ICT tools in the classroom will increase the efficiency of the educational process, extending the range

of teaching methods open to students, teachers and managers. These tools' use will also make it possible to appeal to the necessity of lifelong-learning for all school staff to obtain immediate, up-to-date information. We are here also talking about creating the conditions for a flexible, more accessible and individual learning process. Improving the work of teachers and enhancing their competence in removing barriers to equal access to education is certainly a hot topic, which includes the provision for every individual to effectively realize all of their potential. Young educators and managers mostly have a very positive relationship with digital technologies and like to try out non-traditional forms of work (Brdička 2012). Managing their activity involves promotion of the formation of a large number of digital skills (Svoboda, Andres 2017a). With the use of new technologies, teaching and management methods can both be changed. The assumption is that e-learning and m-learning, on-line and off-line courses (e.g. Blended learning, C-learning) can become a common support for learning, and the next generation of 'correspondent' courses can be built up.

The benefits of advanced technologies to educators and school leaders include (Svoboda 2008):
- creating space for talented and disabled students;
- the immediate availability of educational materials;
- providing school materials based on new and useful case studies, derived from specific real-life situations;
- interactivity and the possibility of continuous innovations of textbooks;
- choice of individual learning paths and goals;
- taking responsibility for one's own learning and decision-making, allowing self-control and self-assessment;
- activating methods and forms of learning, learning new learning opportunities;
- applicability to lifelong learning and quickly obtaining information;
- ICT tools in schools can bring in a much wider range of learners of all ages;
- the appropriate supplementing, support and increased efficiency of education, with expanded range of teaching methods;
- creating learning opportunities anywhere, anytime, shared learning.

Effective school management with the use of digital technologies also brings with it the possibility for realization of selected other conditions. These include the need to use digital technologies throughout the school year, bringing m-technology into the pedagogical practice management model, applying digital technology in college education, and the use of digital technology in school organization and management.

Many teachers and school management are already inadvertently using these technologies. For example: to prepare for meetings; to manage pedagogical colleges remotely; to implement electronic conferences; to access shared online spaces (for digital teaching materials – DUM, documents, web links, scenarios, methodological guides, etc), communication; self-education; school

presentation; economic analyses; statistical calculations; school agenda processing, and organization and management of their school through appropriate software products (e.g. Open Source, freeware).

The dynamic development of digital technologies in the area of m-technologies has lead to their greater expansion, not only in the commercial sphere, but also in education and school management. Mobile technology is a popular novelty, mainly due to its properties (accessibility, modernity, practicality, interest, non-tradition), (Svoboda 2016). Its use in traditional teaching corresponds to the needs for improving the quality of education and strategies for digital education by 2020 set out by the Czech Republic's the Ministry of Education (MŠMT 2018). Management activity will become more flexible and will meet the needs of effective management of schools and school boards.

The role of the Head teacher in the introduction of new technologies is key to any such reforms within their school (Flanagan, Jacobsen 2003), which has been confirmed in the research plans for the introduction of various school information systems (Yuen et al. 2003). Digital competence includes the ability to use ICT, especially Learning Management Systems and other applicable systems (Mesárošová, Cápay 2014). Depending on the thematic structure of the issues addressed by the European ICT cluster and the overview of the main recommendations outlined (Brdička 2012), these correspond to digital competence with lifelong skills and must be considered key in the field of teacher training. In addition, it is necessary to place an emphasis on the application of new technologies to teaching, as far as it relates to the changing needs of the labour market and industry. Support for research into the impact of digital technologies on the educational process is also essential. Teachers' digital competence must include the ability to critically access educational technologies, i.e. the ability to recognize their learning potential.

Teachers and managers need to have digital competence for other reasons too (Schiller 2013):
  • motivate colleagues to make changes and develop the school;
  • convincing about the importance and benefits of change;
  • promote further education in digital technologies;
  • take responsibility for making changes;
  • to facilitate the integration of digital technologies into the education and administrative processes of the school.

Without well-developed digital competence, it will be difficult to flexibly respond to the dynamic development of digital technologies and their application in practice (e.g. for future development of Industry 4.0). For example, the French Ministry of Education, which has introduced state certification in digital competence (predominantly at universities), considers digital competence to be of great importance. The reason they introduced this certification was so that all students could receive a certificate of competence, both in the interest of the successful course of their studies and their future inclusion in professional life (Cochard 2012). It is also about the availability of operational capabilities (ad-hoc solutions) and the ability to communicate and work through ICT.

According to the DigCompEdu 2.0 (Joint Research Centre European 2016) committee and its updated formation, DigCompEdu 2.1 (Carretero, Vuorikari, Punie 2017), the need for digital competence penetrates all areas of human activity:

- *Information and data literacy (working with information).* Searching for and processing digital content. This also includes information evaluation, critical assessment, analysing, organizing and storing.
- *Communication and cooperation.* Digital media as a part of communication – communication and collaboration require effective interactions and sharing capabilities through digital technologies. It also makes it possible to engage in civic activities. For these activities carried out in the digital environment, it is necessary to know and respect information ethics, netiquette and ability to be able to take care of their own digital identity.
- *Creating digital content.* It is important to create new digital content, and also to rework or remix existing content. It is necessary to understand copyright and licenses. In order to solve some problems or perform certain tasks, the student should master at least the basics of algorithms and programming.
- *Security.* Security includes multiple sub-areas ranging from protection of computer equipment. through to online privacy and health protection, maintenance of the quality of life. and environmental protection. Security on the Internet includes knowledge of the potential risks and hazards, prevention of threats, danger and attacks, the importance of content protection, and health aspects.
- *Problem solving.* Solving technical problems arising from working with digital devices, as well as selecting and using appropriate digital tools and appropriate technological solutions. Creative use of technologies, innovation of traditional practices and cooperation with others in this area are increasingly important. It is also important to improve one's own digital competence in relation to the dynamically evolving digital technologies arising in the wake of Industry 4.0.

Being a digitally competent teacher also means tracking current trends in education with a focus on digital technologies, and being able to leverage the learning potential of these technologies. Virtual reality, augmented virtual reality, mixed reality, 3D multi-user virtual environments, robotization, gamification, artificial intelligence, and the Internet of Things all enter the forefront. The self-education and personal development of teachers, existing communication programmes, on-line courses, blogs, professional community of teachers, webinars, Massive Open Online Courses (MOOC) and their variations allow teachers to take a variety of forms of personal and professional growth, as well as collaboration through professional communities through Personal Learning Environments (PLE).

Upcoming trends in education will focus on: blended learning; flipped classrooms; m-learning; adaptive learning technologies; learning analytics; the Internet of Things; the new generation of LMS; re-designing learning spaces; learning to support innovation culture; the development of in-depth learning; artificial intelligence, and natural interfaces (Horizon Report 2016; Open University

Innovation Report 2017; Gartner.com 2015, 2018). A closer look at some of these trends follows below.

Blended learning – The advantage of blended learning is in adapting teaching to educational needs, engaging more senses, the use of multimedia, encouraging the flexibility and individualization of education, and encouraging students to think and self-study.

Flipped classrooms – The advantage here is that students can prepare for the lesson in advance (for example, by watching a video tutorial, animations or a new substance), and then apply key concepts with feedback (the student has questions and performs active tasks). Subsequently, students check their understanding and extend their learning.

M-learning – The advantage of using mobile technologies in education is the ability to learn anywhere and at any time. The equipment is always available. 70% of users are motivated to learn via mobile devices, because learning is 45% faster with mobile devices than with PCs (Gartner.com 2018). However, the courses and tutorials need to be adapted to mobile technologies. Another advantage of m-learning is the combination of gamification and microlearning (e.g. any short-term training of 5–10 minutes, such as a 4-minute repetition exercise). Extended virtual reality use, such as for learning languages, is also a part of m-learning. Adaptive learning technology, virtual tutors and ChatBots can also be used in learning. Mobile devices should not be perceived as a substitute for education, but only as an add-on or support. The purpose of 'mobile learning' is not to replace classroom instruction, classroom lectures or the more usual use of computers in education, but to increase its efficiency (Lynda 2018).

Cloud services – Another trend is the sharing of materials online ('in the cloud'), working in the cloud and video conversations. Cloud solutions offer a whole range of new sharing and collaboration options, including sharing of documents and media content, storing and sharing of individual file versions at work, data synchronization, virtual spaces, web conferences, lectures and training (Svoboda 2015b). All of these tools enable online learning. Students and teachers work together in groups on peer-to-peer activities, thus developing social constructivism, international collaboration, collaborative learning, student-centred learning, highlighting interactions, working in groups and solving problems. It is precisely the emphasis on the greater interconnection of people (so-called shared learning), that is an important trend in on-line education and informal education. Cloud services are also used in education to improve teamwork among students and educators, the school head and other staff. Research surveys have proven that, in practice, the use of cloud services in education is clearly more effective than traditional practices (Svoboda 2015c).

Learning analytics – Tools for analysing learning outcomes and learning failures. Research in seven European countries has shown the results of student assessments of teaching, as well as what competence the students had acquired at the end of their studies (Eurashe 2018; EUA 2018). The trend in learning analytics will be in the transition from summative to formative (EUA

2018). Education 4.0 will change society and create new professions, and wearable devices are part of this: biometric sensors measuring emotions, stress, pressure, facial expressions, and voice. These sensors can be built into smart watches, bracelets, smart glasses, cars and even pens.

IoT (the Internet of Things) – This will measure all classroom learning, not only online, and is expected to trend around 2025. Experts estimate that the Internet of Things will have grown to include some 30 billion devices by 2020. Such smart devices communicate with each other via the Internet, Bluetooth, RFID, NFC, and also QR codes, barcodes and digital watermarks. Smart devices use these channels to send data and interact with each other. In the future, smart homes, smart schools, smart cities and smart regions will all be created. Obviously, IoT is expanding into both our homes and our cities and will affect each of us. Therefore, attention needs to be paid in this area, and in our schools, to include the IoT in teaching.

Learning Management Systems (LMS) – According to a report by the Economic Forum, the development of empathetic thinking will also be very important (The World Economic Forum 2018). There is even talk of changing LMS from being a curriculum management tool, to supporting adaptive learning and the use of special data analysis and visualization tools for improved curriculum design and recording of student progress (Economic Forum 2018).

Redesigning educational spaces and libraries – Spaces that support flexibility (customization and modification), should be capable of being customized for project-based learning and the ability to use multiple devices simultaneously (e.g. cameras, tablets, touch screens, interactive displays, multi-boards, 3D glasses, etc). They should be able to accommodate 3D printers, scenery and moving furniture, to create hybrid classes and laboratories, such as for teaching laser cutting, CNC machining and metalworking. The learning space can then be a classroom, and afterwards, a workshop. Classic classroom layouts are no longer enough, and libraries can become co-working centres, with the ability to facilitate building robots, electrical circuits, and the use of gaming consoles.

In-depth Learning – learning based on experience and authentic fact-based learning. Use of internet encyclopaedias, blogs, involvement in project work by students from all over the world (learning by doing).

Overall, the challenge is to build and develop teachers' digital competence so that they can prepare pupils for life in the 21st century digital world. This is already a very natural micro-environment for the emerging generations, which use ICT tools not only for entertainment, but also in their own, personal formation and self-development. Digital literacy is no longer perceived as a purely technical component of education in technical fields, but has become a general educational component. Therefore, digital competence is not a requirement exclusively for teachers of vocational subjects. Similarly, teachers of the social sciences must be equipped with adequate digital competence for them to provide students with the ability to be competitive in the labour market (ETA TACR PID: TL01000192, 2018).

While respecting the fundamental links between competence with digital skills, it is also necessary to assume that future educational programmes will be modular in nature, including a defined standard that ensures the appropriate quality of the educational process. Such modules would mainly relate to subjects within the teacher's professional competence, and support the students' digital competence. Technology can be helpful in teaching teachers, helping with the didactic transformation/interpretation and modernization of learning content, enriching cooperation, communication and integration of social partners, as well as providing important feedback channels that are crucial to self-identification. Differentiation of the status of schools with regard to regional competence would place an emphasis on management of the educational process and its quality control (ETA TACR PID: TL01000192, 2018). Digital education responds to the need to improve the quality of education and lifelong learning. It contributes to the possibilities of meaningful use of new technologies in teaching and is desirable in the current conditions of European education. Digital technologies and the use of ICT tools have already become a significant help in education and school management.

3.4. ICT in informal education

Informal education is closely related to the concept of lifelong learning. It cultivates the personality and develops important skills. Informal individual learning is almost always the best way of acquiring digital skills, as it is based on the natural pace of the individual and reflects their real needs and everyday practice. Real motivation, digital literacy and access to digital technologies are, however, needed to reach the full effectiveness of individual learning. Digital technologies are therefore an appropriate complement to achieving educational goals. But how can ICT be applied in informal education? One example is Bloom's digital taxonomy, an extension to the original devised by Andrew Churches, to prepare students for life in the 21st century.
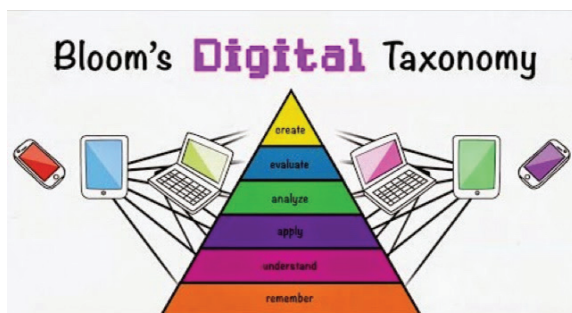

Figure 5. Bloom's digital taxonomy
Source: CommonSense.org, 2018

Bloom's digital taxonomy (Churches 2008; Bořecká 2015):

- *Remember* – for example, find, mark, select, save. Be quick to search for quality information and store saved information in the form of book-marks in your web browser. Applications (apps) help you find, define, remember information, facts and ideas, and recognize facts and ideas in context. Examples of usage: illustrations (Graphic Editors, Sketches, Notepads), interviews (sound recordings), presentation and editing (text, spreadsheets, presentation editors), demonstrations, simulations (video, animation, chemical and physical experiments, biological, geographic, focusing on the presentation of information and facts), virtual tours, web resources, educational applications (to gain knowledge and verify that it has been learned).
- *Understand* – uses verbs to blog and subscribe to things. At this level, technology is primarily concerned with processing and understand-ing the information found (schema creation, thought maps), social net-working and blogging, in which the possibility of commenting leads to a better understanding of the issue. The software helps summarize facts and ideas, rework methods and procedures, explaining ideas, concepts, interpreting relationships, paraphrasing information, predicting conse-quences, giving examples, rewriting information, events and problems in your own words. Examples of usage: sorting (rights of photographs, elec-tronic books, thought maps and illustrations of the information obtained), annotation (inserting notes into documents), blogging, RSS feeds, social networks, image creation to verify correct understanding of the subject, explanation and verification (graphic and presentation editors, text editors).
- *Apply* – to upload, share, edit. This level is closely related to computer literacy, because applying digital taxonomy means choosing a hardware and software tool or an online service to achieve the desired goal (pro-cessing data, uploading and sharing media to websites, creating presen-tations, editing videos). The software helps to demonstrate methods and procedures, to implement procedures, to use ideas and knowledge, to use and discover a new purpose for skills and knowledge, to experiment with concepts in another environment, to use knowledge in a different context than the one in which it was acquired, and to apply procedures in different situations. Examples of usage: document creation (such as text, spread-sheets and presentations, comics, posters, videos and sound recordings, design of 2D and 3D geometric objects).
- *Analyse* – to refer, tag. A necessary prerequisite for proper analysis is the student's level of reading comprehension, necessary in order to divide more complex information into basic elements, to organize and struc-ture, process and evaluate it (create an online questionnaire, divide the acquired data, draw up a graph and establish conclusions from the data, create and verify linking of different documents, verify the authenticity of the information). Software is here used to validate the information found,

categorize, estimate, model, organize, process and evaluate data, and create hypotheses. Examples of usage: spreadsheet editors, graphing applications, and data processing training applications. These are usually focused on astronomy, physics, apps for creating maps, time axes, databases, Shared Data Spaces, and Virtual Labs.

- *Evaluate* – comment, collaborate, be in a network. With assessment, students meet in everyday life, often evaluating the contributions of their classmates, for example, on social networks, in school magazines, or in evaluating computer games. In the world of digital technologies, for example, blogging, debating, moderating and networking are also included. Applications help to check accuracy and results, identify discrepancies, evaluate effectiveness, review processes and selected techniques, and critique solutions. Examples of usage: social networks, telephony, online conferences, videoconference, applications or services for collaboration, evaluation and testing, remote laboratories.
- *Create* – program, animate, film, publish. This is the top level of taxonomy, and requires the student to be creative in their own work, so that it is unique and not a copy of other work (such as videos, podcasts, programmes and electronic publications). Software helps students to implement ideas, combine their own processes, create their own plans and work. It also, for example, helps them construct patterns, designs, identify options, build ideas into a suitable sequence of steps, process suggested hypotheses, develop a plan, and reorganize procedures based on findings and lessons learned. Examples of usage: apps for creating videos, sound recordings, animations, podcasts, comics, image editing applications, presentation editors, whiteboard and screen-casting applications, 3D object creation applications, applications for creating electronic publications, for example for storytelling.

3.4.1. M-learning – new methods and forms of education

Traditional lessons usually take place in classes where the teacher presents the teaching material to a group of students. Teaching depends mainly on teachers and students physically participating in the learning process together. Notwithstanding the clear advantage of direct contact between teacher and student and immediate feedback, the traditional concept of teaching has many disadvantages. For example, if a student cannot attend the lesson directly, they lose contact with the teacher and the material needed for learning (Georgiev, Georgieva, Smrikarov 2006). Contemporary learning provides more space for gifted and handicapped pupils – taking into account their individual pace and needs, recreation and availability – and does not require immediate availability of educational materials. The classroom-based learning process can hardly be broken down into steps and sub-tasks so that individual learning paths can

be constructed; it cannot recognize the needs, preferences and learning styles of individual students and subsequently define learning objectives optimized for each individual (Brown 2006). There is no need for automated replenishment of school materials about useful, up-to-date case studies, derived from concrete real-life situations, and does not guarantee the flexibility of textbooks. It provides students with less opportunity to take responsibility for their own learning and decision-making, self-control, self-assessment, and teamwork. It contains less activating methods and forms of learning that give students space for specific activities, self-reflection and self-query. The student should not only be a passive recipient of information but also must show their own initiative – to act, to think, to speak and to create (Čadílek, Konupčík 2008). These and other disadvantages lead to the search for new and more effective teaching methods more suited to the locale, availability and other factors of the teacher and students. Using new technology, teaching methods are changing in most schools. The assumption is that e-learning and m-learning, blended learning, on-line and off-line courses are common supports for learning. The current m-learning trends that can be used in e-learning include webinars, MOOC courses, gamification, digital badges, expert communities and websites. According to (Gartner.com 2015), ICT consumerization is increasing – ubiquitous smartphones and tablets, higher ICT literacy, cloud access everywhere – scalable, endless resources wherever needed, and with mobile technology, convenience and flexibility. Nowadays, we are living in the mobile age, not the computer age.
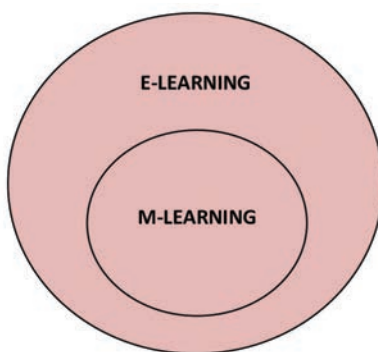

Figure 6. M-learning as a subset of e-learning
Source: original study

3.4.2. The goals and purpose of m-learning

In the term 'm-learning', the letter 'm' stands for 'mobile' (movable, variable). In the background of everyday life, the word mobile ends to stand out – mobile technology. And in the term 'e-learning', the 'e' is for 'electronic'. What m-learning actually means, though, is the use of mobile technologies in learning

or education. M-learning enables learning in places where traditional e-learning is not possible.

M-learning is an appropriate complement to and support for education, in its linking of formal and informal education. The definition of m-learning is based on the ability to learn anywhere and at any time without constant physical connection to a network (Fojtík 2007). This is done using mobile devices, such as tablets, phablets, smartphones, laptops, ultrabooks, 2v1 devices, audio and video players. These resources must be associated with software to provide the information needed for teaching, for the mutual exchange of information between students and teachers. Communication devices and other new, mobile learning tools are used at home and at work, as well as on business trips, in free moments and in a variety of situations (Peters 2005). Nowadays, it is necessary to obtain information quickly, which is not always easy when dealing with enormous amounts of data. Continuing education often does not have time. Traditional e-learning is no longer enough, so one of the new directions in educational ICT use is m-learning. With mobile devices, written and audio notes can be recorded directly, although it is important to have an internet connection. One very important feature of mobile devices is synchronization, which allows selected data on one device to be replicated on other devices. For example, for sharing bookmarks between a smartphone web browser and a desktop web browser. The most important and sophisticated features here are organizational functions. Mobile devices are a powerful tool for organizing time and planning activities. Students are very familiar with the need for time management, and after a while can get very good at it. It is very useful to have necessary shared, up-to-date information (not just for studies).

Lifelong learning is essential (many companies require lifelong learning for their employees), thus fulfilling one of the essential conditions for creating an information society.

Virtual reality, augmented virtual reality, robotization, gamification, artificial intelligence, and the internet of things all enter the forefront. According to (VUPPRAHA 2008), the highest level of e-learning are courses that use learning management systems (LMS). Participants have access to a virtual classroom, which includes learning materials and tools for communicating with the teacher, as well as organizational instruction for study. It is precisely this emphasis on the greater interconnection of people (so-called shared learning) that is an important trend in on-line education and informal education. The goal of m-learning is to create conditions for the learning process that are more flexible, more accessible and individualised. Every moment of free time can be used for education, using, for example, a smartphone. Mobile devices are becoming more and more accessible and can bring a much wider range of people of all ages into education. Over time, the performance and individual features of mobile devices, as well as compatibility with standard PC programmes, are all increasing (Svoboda 2011). We must not perceive mobile devices as a substitute for education, but only as an add-on or support. The

purpose of mobile learning is not to replace classroom instruction, classroom lectures or normal computers, but to increase its efficiency. It also offers other, extended teaching methods. Currently, education is commonly integrated into day-to-day work, it is essential element of business, and increases employee access to important information (Svoboda 2018).

3.4.3. Mobile technology in teaching

Computer teaching has been heavily implemented since the 1980s. In the 1990s, computer use was extensively expanded in schools everywhere, connected to local computer networks to share information and technical resources, and then connected to the Internet when it became widely available. For education purposes, the easy and comprehensive accessibility of information from around the world is of enormous benefit. The use of mobile technologies in teaching depends on the specific content and nature of the subject. In general, students can search for information on the Internet and process it in different editors and processors, learn it with different tutorials, or learn using new computer skills. The way IT is implemented in a computer-based classroom depends on the physical arrangement of the computers and the number of students. It is advisable to teach in steps the tasks that students will perform, individually or in groups (Straková 2007).

What actually needs to be in place for m-learning to take root, and help find new and effective learning methods?

- Having spaces for gifted and handicapped pupils (individual pace, needs, relaxation, time choices of breaks).
- Immediate availability of educational materials (animated demos, audio and video recordings, programmes for teaching and practicing).
- Automatic replenishment of school materials on new and useful case studies, derived from specific, real-life situations.
- Flexibility of the texts usable in the class.
- Individual learning paths and goals.
- Acceptance of responsibility for own learning and decision-making enables self-control and self-assessment.
- Activating methods and forms of learning, new learning opportunities.
- The necessity of lifelong learning, the quick acquisition of information.
- Appropriate teaching add-ons, support and enhancement of educational effectiveness and enhanced teaching methods.

The kinds of software used in m-learning can be classified into three main groups (m-learning.org 2011; Svoboda 2011):

- The first group consists of teaching programmes. These are specifically designed for e-learning but adapted for use on mobile devices. They contain all the points of classical learning programmes – introduction to the subject, teaching theory, practical exercises and test exercises.

- The second group consists of applications and programmes indirectly focused on teaching activity. These are information, professional and practical applications. The task of these applications is not to directly teach, but to be an add-on. In these applications, students read, listen and learn about specific things. They include foreign-language dictionaries, vocabulary from various trades and professions, as well as professional encyclopaedias.
- The third group consists of other applications that can be used in m-learning. This group is very close to the second group and the applications are similar. These are mainly practical apps (currency converters, conversion meters, weight converters, e-books, m-books, games for development and education).

M-learning (and e-learning) programmes are also a comprehensive information education system that includes individual learning, training, and test elements. This system can either have a single field or several subsystems, depending on the industry or profession being taught. Learners are logged into a system via their mobile devices and go through the entire system or its expert subsystems. An important element of m-learning, on which the use of individual mobile devices depends, is the availability and speed of an Internet connection. Without fast data transfer and solid connectivity, m-learning is not really usable.

Still, mobile technology not only facilitates certain study tasks but can also serve as a motivational tool. The use of mobile technologies by students can be divided into three basic approaches (Fojtík 2007):

- with their own mobile device, at their own discretion;
- with a mobile device lent to them by school, with the work set by the teacher,
- with their own mobile device, with the work set by the teacher (BYOD).

Student continue to use their mobile device to organise their time and tasks, to make contacts, notes, manage documents, for electronic communication, internet browsing and reading e-books. The most common uses of mobile technology by students are for (Fojtík 2007; Zaoral 2006; Svoboda 2016):

- organization of meetings, tasks, notes;
- contacts, e-mail client, internet telephony, chat;
- as a voice recorder;
- processing and reading of texts, charts, presentations;
- drawing and graphics, playing audio and video sequences, video instructions, MP3, educasting, cloud services;
- translation dictionaries, reading of e-books (e-book, m-book) and RSS feeds;
- multimedia (games, entertainment), apps for sport;
- maths and legal systems;
- sharing projects (eTwinning), school wikis;
- teaching foreign languages, various teaching programmes (Apps for education).

For social science subjects, students can find specific quotations, original text, EU documents, statistics, yearbooks, current legislation, and digitized library books using their mobile devices. In artistic fields, they can be used to access databases, art history, communication (discussion forums, counselling), digitized library books, to work with information, and to collaborate with experts in the humanities. In musical education, mobile devices are useful for recording authentic sounds in the field, making various other recordings, and researching music history. In other fields, they can be used for distance measurement, meteorological information, GPS route-finding, traffic updates, cartography, geographic information systems, geocaching, and monitoring river and field sensors.

A teacher's work is not only about direct pedagogical activity, but includes several aspects of organization, documentation, preparation and so on. The most common areas of mobile technology utilization by teachers include (Fojtík 2007; Svoboda 2012):

- time organization – making appointments such as class meetings, meetings with parents, meetings with pedagogical-psychological counsellors;
- maintaining directories, contacts, notes – part of a teacher's notes can include databases of students personal data;
- reading electronic books – with which it is possible to make full-text searches, notes and bookmarks, and integrated translation dictionaries;
- working with documents (texts, charts, presentations, pictures, test questionnaires), LMS, accessing personal learning environments;
- using calculators, rendering graphs of functions;
- accessing teaching and knowledge systems, preparing electronic study texts;
- joining electronic conferences, webinars, MOOCs.

The most common areas of mobile technology utilization by head teachers include (Schiller 2013; Svoboda 2012):

- preparing for meetings, document sharing, remote management, task monitoring, time management, electronic conferences, self-education, presentations, school organization and management, use of cloud services,
- economic analyses, questionnaires, statistical calculations.

Mobile devices are not suitable for extensive document editing, but are fine for viewing documents or making minor edits. They are also useful tools for quickly capturing an idea and making written and voice notes directly in the moment. Their main advantage is that a mobile user can have hundreds of documents on their device, which are always available for reading, anywhere, at any time. When entering input information, an external keyboard can be used, and mobile devices with smaller displays can use projection technology to connect directly to a monitor or data projector with wireless technology.

3.4.4. Innovations in education using cloud computing

A necessary part of the school's organizational structure is its information and communication system, which streamlines its planning, inventory, and project management. The school management system enables support for school management, teachers, parents and students. Significant simplification of the entire system can be achieved through the use of so-called cloud computing services, in which data and even entire programmes are stored on external servers. Cloud services are economical, provide access to school data from anywhere, enable collaboration and document sharing, and stream applications directly into a web browser. They simplify overall IT system management and make it easier to set up, configure and use services anywhere.

Cloud computing allows users to work remotely from their offices, homes, laptops, tablets, phablets, smartphone, watches, i-glasses and so on (Revenda 2014). Users' data is backed up to remote servers automatically. The principle of cloud computing in schools is to move programmes and content from school servers to the external servers of the service provider. Data is stored in the so-called cloud (in reality, another server somewhere in the 'cloud' of servers on the Internet), and is available at any time with an active internet connection. If the connection fails or is not available, the data upload is paused until the connection is restored. The school itself does not have to deal with installing and upgrading programmes, but must at least ensure a good internet connection for all the departments in the school, as well as students who use their own mobile devices in school (Bring Your Own Device – BYOT/BYOD), (Neumajer 2013). The use of cloud technologies in the learning process is referred to as cloud learning, and clearly leads to improved group collaboration. Use of cloud technology does not require any special equipment, and can use any operating system or web browser. Cloud platforms offering a comprehensive portfolio of services are available from many companies, including the Big Three: Google, Microsoft, and Apple.

Cloud solutions offer a whole range of new sharing and collaboration options. Sharing of documents and media content, storage and sharing of individual versions in a research phase, virtual spaces, web conferences, lectures and training, archival material (Kocián 2013). Other possibilities of cloud computing include data synchronization between devices, browsers and editors for dozens of basic data formats, use with audio and video players, organizing media into libraries, connecting to instant messaging clients for convenient multi-user collaboration in real-time, combined with commenting, chat, audio and video conferencing, shared desktops, projection and publishing on the Internet (Velte 2011).

The current developmental tendencies in education are increasingly focused on the use of digital technologies in teaching. Teaching materials are often projected onto a screen or whiteboard, or fed to an interactive whiteboard, from the teacher's or classroom computer (Martinková 2010). With non-cloud computing, problems can occur with stored data, materials going out of date or getting lost,

e.g. on flash drives. But all of these issues can be mitigated by cloud storage. Data synchronization allows for changes made to documents on a local device (notebook, computer, smartphone, etc) that is linked to cloud services (Tocháček 2010) to be propagated to all versions of those documents on all other connected devices. Cloud services are also used in education to improve teamwork among students and educators, school heads and other staff. Research surveys have proven that in practice, the use of cloud services in education is clearly more effective than traditional practices. Schools are continuing to expand their classroom equipment with digital technology. The use of digital technologies in education depends not only on having the skill to actually use them, but that the technologies themselves are appropriately applied in didactic and appropriate ways, together with all didactic means of teaching (Leipert 2012). When using cloud services in the learning process, there are changes in the teacher-student relationship and their roles in group collaboration. Once put into practice, these changes create new issues. One is the student's response to the content of the Internet education and the presentation of digital teaching materials located outside local storage (cloud services), compared to traditional learning materials. Another are the benefits of cloud storage compared to local storage for digital learning materials. But international research has shown that the use of ICT tools in teaching improves pupils' knowledge, skills and abilities, and increases their motivation for learning, their self-confidence and activity. In this context, student motivation grows with the use of other digital technologies, especially interactive touch systems. As part of this, social networks and other Internet-based services are used to enable communication between pupils, educators and other stakeholders. Documents are shared and online communications help solve problems in a short period of time. Cloud services with learning opportunities began to appear around 2005 with the introduction of Learning Management Systems, and since 2010, a new concept of cloud services has been developed with access to more cloud-based products (Mediaplanet 2013). Another trend associated with cloud services is working on touch devices that clearly support BYOT/BYOD use, and the use of cloud services for personal and school use. The use of cloud services in education is in fact quite common. They can be used in the educational process of students, for organizing the work of teachers, students and school management, and for managing the teachers' paperwork. The undisputed benefits of cloud data storage include data being available and synchronized at all times and in all places. It can be edited straight away without any need for special hardware or software, for example, in a web browser or mobile environment.

3.4.5. The benefits of online collaboration in education

Online communication tools are highly suited to informal education, for example, social networks and cloud services. These kinds of ICT tools enable school activities and extracurricular activities to be organized online by sharing content based on interests. Groups can be formed for classmates, colleagues and students to share documents, videos, and links to interesting articles. Another example is videoconferencing, which allows teams to collaborate on documents, or with foreign guests. On-line collaboration lets teams assign work to different members, view their screens in real time, or share photos, documents and presentations. Using the Remote Desktop feature of Windows, video-call participants can even pass control of their computer to other participants. Online collaboration can be easily used for informal learning, as well as distance education for students with individual learning needs, or students with long-term illnesses who cannot attend school. For example, multiple authors can collaborate on the same document, at the same time, using a chat client to type or talk to each other. Each author can see exactly who is collaborating on the document, and where they are within the text. The editing environment is basically the same as any other text editor, but the work is instantly and automatically synchronised on a remote web server (Hanson 2012). Similarly, cloud-based calculators can be used for doing mathematics work. For presentations, collaborators also share the editing environment, selecting and placing images and text, or audio and video recordings of a speaker's notes, and view projections of the current slide. It is possible to embed streaming internet videos or download links to additional data in the form of hypertext objects. Wherever a presentation or project is worked on, whether at home or at school, problems with exporting files, compatibility and version mis-matches are eliminated through the real-time synchronisation of the work across all of the participants' devices (Rychlík 2013). And with a graphics editor or art package, educational infographics and images (digital learning materials) can be added to any kind of document.

Shared calendars facilitate highly effective collaboration and scheduling. Calendars showing different types of events can be viewed simultaneously by collaborators, to more effectively plan their meetings. Online calendars can also be linked to other applications on other devices, both fixed and mobile devices (Mediaplanet 2013). Documents, spreadsheets and school presentations are all available on file-sharing websites. This kind of shared space can be used to create custom document libraries with different access permissions. These can be set to allow access to students or teachers, to help them prepare for lessons, or even with other members of different teams.

To summarise, use of cloud services greatly simplifies group collaboration. Teachers and students can record information in projects, calendars and documents from anywhere with access to the Internet, and keep them up to date across all connected devices. Education incorporating online services and cloud computing greatly increases efficiency in completing common tasks (Velte 2011; Lacko 2012).

Summary

Knowledge of ICT tools and their uses will ideally find their way into the curriculums of schools around the world, and as part of educational reforms everywhere. Approaches to the acquisition and further development of teachers' digital competence is also an important part of this. Changes in society caused by the development of science and technology are signs of the gradual global transition to an information society. At the same time, it is important that the development of teachers' digital competence is accompanied by development of their non-digital competence.

Innovative methods and forms of teaching place an important emphasis on the use of information and communication technologies, as well as elements of practical learning. The constitution of information societies and a knowledge societies requires – in the technical, humanist and social spheres – the higher intervention of pedagogical knowledge and activity, as well as more dynamic development of pedagogy itself. More accurately, the term 'knowledge society' should be thought of as a society of intensive knowledge processes. Indeed, everything that can be observed represents a huge and unprecedented dynamic of the processes connected with acquiring knowledge. Because permanent innovation is a necessary condition for the survival of business, and lifelong learning an unavoidable prerequisite of employment, the continual recombination of the huge quantity of new findings produces new knowledge. This corresponds to the concept of Education 4.0.

Chapter IV

The findings of the ICT Guides

Joanna Leek, Marcin Rojek

Introduction

The role of ICT (information and communication technologies) in education is well recognized and is still a subject of interest. It is believed that proper ICT use encourages learners to think, create and solve problems in new, unconventional and innovative ways. In this sense, ICT should be seen as a modern teaching and learning aid. It is also inextricably linked with the school as a social institution. ICT touches on both formal learning at school, and informal learning outside school. Spatial, physical and virtual learning together form a structured environment in which learning can take place. But learning in the twenty-first century requires a new kind of space, that can connect learning in school, home and in the community, and that increases flexibility and supports learning beyond the school walls and outside of traditional school hours. This space could be a virtual world, accessible to both youth and seniors through the use of ICT tools.

In this chapter, we present the findings of the research conducted under the ICT Guides project. Firstly, the methodological background is covered, followed by data on each of the four courses. The chapter ends with conclusions for each of the main research questions.

4.1. Cases studies – the intergenerational learning courses

In our research for the ICT Guides project, the main question we sought to answer was: *How can we use ICT, intergenerational learning (between young immigrants aged 12–16 and older citizens over 65), and the theory of empowerment to reduce ESL (early school leaving)?*

The specific research problems we posed were:

- *How can ICT be used as an effective tool to overcome the polarization between young and older citizens?*
- *How can ICT facilitate access to the general education system for newly-arrived immigrant children aged 12–16?*
- *How can ICT be used as an effective tool for improving access to lifelong learning for older persons?*
- *How can ICT increase the acquisition of key EU competences, and in particular communication and language skills, in immigrant students aged 12–16?*

- *How can ICT contribute to a better understanding and harmonious coexistence between young immigrants and older people, both living in big cities?*
- *In what ways and to what to what extent were each of the generational groups empowered by intergenerational learning?*

To find answers to these questions, we adopted a mixed research approach, conducting qualitative and quantitative research simultaneously. We assumed that the social world is not empirically measurable and that society is not the sum of physical individuals. Therefore, social processes and the behaviour of individuals can be understood and described only when embedded in their culture, which is the axionormative matrix of the behaviour of individuals. The theoretical foundations for this assumption lie in phenomenology, hermeneutics and symbolic interactivity.

Within this approach, we used case study as a research method. This focuses on a concrete example of educational experience and seeks to obtain theoretical and in-depth knowledge based on complete documentation and detailed description. This is possible because case study is a kind of inquiry in which the practitioners (in this case the Madrid, Berlin, Sheffield, and Gothenburg city halls), and researchers (from the University of Lodz), can jointly reflect on specific cases of educational practice. Only through systematic and structured interactions between cognitive exploration and selected cases in the case study was it possible to attain both a theoretical knowledge of the most general character, and a practical knowledge directly related to experience. These offered a better understanding of the complexity, uniqueness and conditions of the cases. Surveys were taken, as well as semi-structured interviews with teachers, youth workers and other staff involved in supporting young immigrants in given countries.

The basic research technique was a survey with closed and open questions. 267 respondents completed the questionnaires.

Table1. Respondents taking part in the survey

City	Students' course – beginning surveys	Students' course – end surveys	Seniors' cours – beginning surveys	Seniors' course – end surveys	Teachers' surveys	Authorities' surveys	*Total*
Berlin	14	0	12	1	1	3	**31**
Gothenburg	22	19	8	7	7	5	**68**
Madrid	17	15	10	14	1	8	**65**
Sheffield	40	22	23	17	1	0	**103**
Total	**93**	**56**	**53**	**39**	**10**	**16**	**267**

Source: original study

Analysis of the answers focused on group experiences, to examine the group as a whole. Thus, each questionnaire was carefully read, and then common strings of text isolated, analysed and compared (Corbin, Strauss 1990). This allowed for identification of code segments, which were grouped by their focus group session. The code segments were used to develop an event category, classified as 'intergenerational learning', and several other themes and subthemes (Creswell 2012). Intergenerational learning incidents were coded as any situation in which a student or senior wrote about course activity in terms of ICT, learning, engagement, involvement, personal development, or harmonious coexistence. All of the answers given by the students were considered, regardless of whether they fit popular definitions of intergenerational learning provided by the literature. Intergenerational learning incidents included one-time and recurring events, and were further coded as acts of intergenerational learning if they involved learning, personal development, teamwork, and relationships with others (if these involved confidence, motivation, or personal relations). Once all of the data were coded, the text strings were again examined and classified by immigrant youth, seniors, teachers and youth workers, then summarized in writing.

The second technique was a qualitative analysis of photographs (visual data/material taken by local coordinators during the actual intergenerational courses). This is being done more and more frequently in the social sciences, as a result of the visualization of the transition and perception of contemporary reality:

> While society's use, production and transmission of visual forms of communication have grown, the application of visual research methods has also become increasingly widespread throughout the social sciences. From its early origins in the first half of the twentieth century within social anthropology, where novel technologies of register and reproduction of images were gradually incorporated into the sub-discipline of ethnographic film and, later, visual anthropology, research with visual technologies and on visual data has evolved into other fields in the social sciences (Knoblauch et al. 2008: 3–5).

The use of audio-visual material offers the opportunity to look at reality through the eyes of the participants, and to see things that might otherwise not be apparent to the researcher. Cultural studies and ethnomethodology are mentioned as the theoretical foundations for visual research. Using this approach, we attempted to answer the following questions:
- What is the content of the photos?
- How was the content created and communicated?
- What is the meaning of this content?

4.1.1. The intergenerational courses held in Berlin

Since 2015, Germany has been the focus of one of the largest waves of migration in Europe. In the last three years to 2018, more refugees arrived in Germany than anywhere else in the EU. According to Eurostat, in Q3 2017 Germany registered the highest number of first-time asylum applicants (28% of all applicants in EU Member States); followed by Italy (20%); France (14%); Greece (9%), and Spain (5%). On account of the large number of people entering Germany, its society is now facing challenges and changes in different areas, as it tries to help the newcomers with accommodation, education and work.

One of the most important areas of help for immigrants is with school and education in general. Foreigners that drop out of school in Germany are four times less likely to find a job than Germans drop-outs. On top of this, the influx of refugee children has exacerbated the problem. Thus, the ICT-Guides project was developed as a preventative measure, and a response to the challenge of incorporating refugee children into school life. From September 2016 to June 2017, four courses were conducted in Berlin in conjunction with two schools: the *Alfred Nobel Schule* and *Fritz Karsten Schule*, as well as one meeting place for the elderly – the *Haus der Lebensfreude*. The survey covered 19 youths aged 14–15 (9 females and 10 males), and 15 seniors aged 70-85. One of the aims of the research was to identify and compare students' and seniors' preferences with regard to ICT tools. Based on the total of 19 baseline survey questionnaires submitted by the youths and 15 baseline survey questionnaires submitted by the seniors, we learned that the most popular ICT tool among the immigrant youths was the mobile phone. Audio-visual systems, online storage, notebooks/laptops and PCs, and tablets/iPads were used every day.
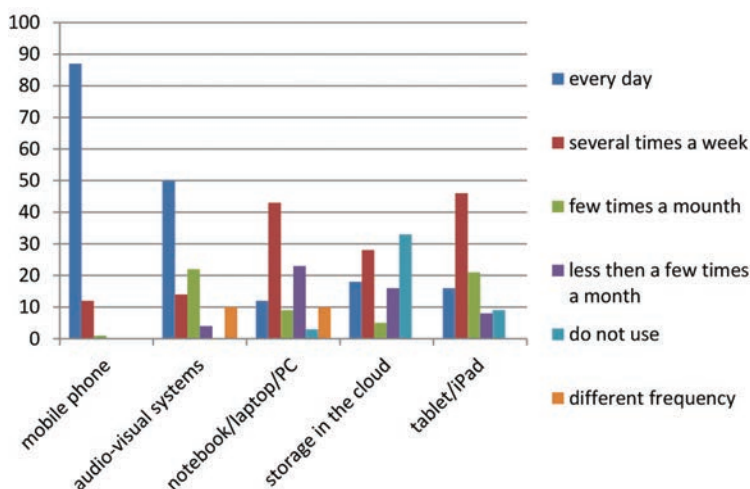

Figure 7. Frequency of ICT device use by the youths, before the course (Berlin)
Source: original study

Before the course, mobile phones were used for communication, entertainment, learning and emotional support. Tablets/iPads were mainly used for entertainment, learning, communication and cooperation, while notebooks, laptops or PCs were used for entertainment, learning and communication and cooperation.
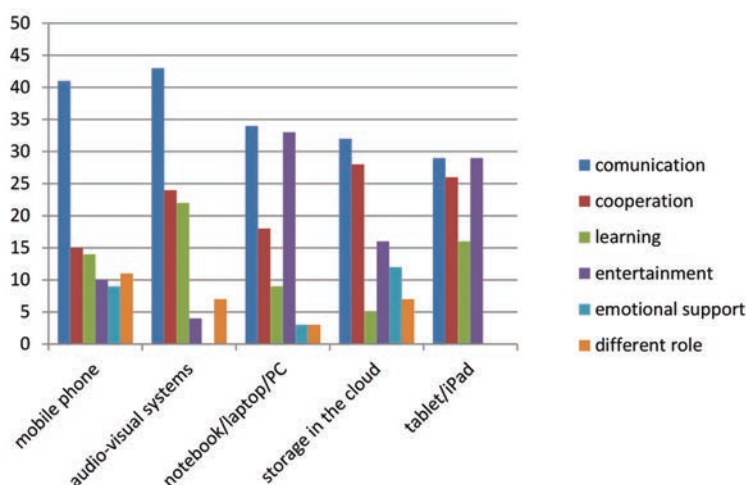

Figure 8. Purposes of ICT device use by the youths, before the course (Berlin)
Source: original study

Before the course began, we asked the seniors about their preferences with regard to ICT devices. They told us they used mobile phones and audio-visual systems (25%) every day, while tablets and iPads were not used at all (83.33%), or just a few times a month (16.67%). Notebooks and PCs were not used by 58.33% of the seniors, while those that had notebooks used them several times a week (25%). Those seniors that had mobile phones used them for communication (76.92%) and entertainment (15.38%). Notebooks were used for communication, learning and entertainment (18.75%), and tablets mainly for entertainment (30.77%) and communication (7.69%). The use of ICT tools in school education was a very significant and recurring theme in the interviews with the teachers and youths. We asked the students how ICT tools might make learning in school more attractive. The youths related ICT tool use to different subjects and activities, for example:

- *It would be more fun to learn.*
- *I can learn better with a tablet.*
- *I could do everything faster.*
- *It's more fun with a tablet.*
- *In Maths, tablets are useful.*
- *…in English.*
- *…in all teaching subjects.*
- *…useful for homework.*

- • *…tablets would be good for incorporating videos from YouTube into classroom learning.*
- • *I wish to use apps like Google translator, calculator or Google search engine for learning and gathering all sorts of information.*

In our research concept, in addition to the seniors and youths we also included the teachers at the schools at which the project was carried out. When asked about the use of ICT in school, the teachers saw distance learning as an opportunity for youths at risk of early school leaving (ESL), for example:

- • *Even if the students are not in the school, they can still be reached by teachers through ICT and be more self-confident in their competences.*
- • *ICT offers opportunities for individual learning for those immigrant students that have specific educational needs.*
- • *For sure it'll attract young people to stay in school. In particular, tablets would give joy and pleasure with learning.*
- • *ICT tools would help immigrants feel more connected to school, and participate more regularly in school activities.*

ICT is perceived by teachers as a tool for integration. In the opinion of youth workers, the positive effects of using ICT in intergenerational learning include knowledge sharing and communication between generations. From the teachers' perspective, the joint activities of students and seniors might increase the interest in education among those at risk of early school leaving, for example:

- • *ICT as a connecting link can be a starting point for long-lasting transgenerational cooperation. With the possibility of teaching seniors something of interest with ICT, students could become more motivated and participate more regularly at school. Students might feel inspired to start an apprenticeship in social work professions, where a high school diploma is required.*
- • *ICT brings youths and older adults together, to develop personal relationships between the two groups.*
- • *ICT can be a starting point for building empathy for each other. Students would learn to understand the needs of the seniors.*

The teachers also talked about the immigrant students' confidence in ICT and the advantages of ICT-supported learning in supporting their education. Also, in the teachers' opinion, ICT-supported learning is a method of self-learning, which offers independence in obtaining information online and a means of self-training outside of school for professional purposes:

- • *Their self-esteem can be raised by showing their competence with ICT.*
- • *The increased motivation of students who use ICT tools intensively is visible in situations in which they're able to gain positive experiences with their skills and abilities, and this leads to strengthening of their self-esteem and greater confidence in their own abilities, which I believe prevents dropping out of school.*
- • *ICT is an easy way to get into computer sciences.*

- *I see potential for ICT tools as a starting point for internships.*
- *Learning platforms in different languages are helpful.*

During informal interviews with the teachers and other staff involved in running the ICT courses as part of the project, we were given some useful tips for subsequent courses. First of all, it would be best if the seniors had their own devices or devices that they could take home to practice with. Practicing at home would also enable contact with the youths, outside of the course. Secondly, the courses could be held in actual schools, so that the students could take part in them directly after classes, without losing time travelling to a different site. During the courses in Berlin, mobile devices were seen by the older generation as an opportunity to communicate, and an important tool for establishing first contact. Otherwise, as one senior said, *the youths wouldn't talk to me at all*. Using ICT in interactions with youths is a *good way to build contact*; *to get to know each other,* and *to get in touch for the first time*. The role of ICT in intergenerational learning was perceived by the seniors as a good starting point for first contact, cooperation, and joint activities.

- *ICT is a reason for a meeting and conversation, during which I can help young people in life, telling them about my life and experiences.*
- *ICT is a great way to show that we can all learn from each other.*
- *…maybe I can convince the young people that school is important.*
- *ICT gives us the opportunity to get in touch and get to know each other. This would help young people find meaning in their work, and I can share my experiences with them.*
- *Through ICT, young people can see that they can do something and teach someone. So maybe they see that it is worth doing something, with someone like me.*

The Internet was seen by the seniors as an important source of information about *different cultures, religions*, but also about the *suburb where we seniors live*, and as a tool allowing them to *start a conversation in real life*. From the beginning, the course was perceived by the seniors as being profitable not only to them, but also the youths. Expectations about the course (before the first meeting), were mostly centred on the joint activities and opportunities to talk about culture and tradition, local areas, and the skills needed to use ICT devices, and on getting to know each other. The seniors thought that:

- *I want to get to know new things. (x2)*
- *You get to know each other better and understand each other.*
- *I expect to learn more about computers and learn more about other cultures and religions.*
- *That I get to know new people, other languages, etc. and help the young people get used to it.*
- *To learn to use my phone a little better and build nice contacts.*
- *Build contact with nice young people and learn something.*
- *I hope to get to know some immigrants and their culture a bit better.*
- *I expect to learn something new and hope for interesting conversations.*
- *To understand smartphones.*

- *I hope to get to know you and other young immigrants' culture a bit better.*
- *…to get to know new people, other languages.*
- *I expect to learn more about computers and learn more about other cultures and religions.*
- *…to build contact with nice young people and learn something.*
- *…to get to know each other better and understand each other.*

Before the course started, we asked the seniors about their needs in terms of technical skills, using smartphones and tablets, operating computers and fixing problems when using computers and software. The seniors saw the course as a platform for common understanding, more than as an opportunity to acquire ICT skills. They told us that they thought the course might be a chance to learn from each other.

Migrants who engage in and succeed at education are more quickly integrated into both the social and economic spheres of their host country, while there is a greater risk of their becoming alienated if the process of engagement and integration takes a long time (OECD Germany Policy Brief). According to the Organisation for Economic Co-operation and Development (OECD), the educational, social and emotional success of immigrant students differs widely across countries, including for students from the same country of origin and of the same socio-economic status. Because the ICT Guides project was designed as an interventional measure aimed at preventing early school leaving, we wanted to find out how youths perceived school, and how school could attract and support them in successfully graduating. One of the initial questions we asked the immigrant youths was about the meaning of the term 'perfect school'. They associated the 'perfect school' with youth-friendly environments:

- *I would like to have beds in the classroom.*
- *A clean place with food, friendly people.*
- *The perfect school is a quiet, interesting and friendly school.*
- *A big, clean building.*
- *No full-time school.*
- *School should not start too early, and not end too late.*
- *School starts at 7:30 pm and ends at 1:30 pm, and you only have subjects you want to do.*
- *No grades, just nice students and teachers.*
- *Nice teachers and students.*

Early school leavers in Europe are much more likely to come from families with migrant backgrounds (OECD 2012; European Parliament 2011; Eurydice and Cedefop Report; European Commission 2011b). Young immigrants' specific educational needs do not get enough attention, such as the teaching methods employed. Young immigrants also face ethnic discrimination that, in some educational institutions, can further reduce their chances of success (Luciak 2004). In consequence, a lack of educational support for students with migrant or minority backgrounds can translate into educational disadvantages and a potential risk of early school leaving. Thus, in our research we wanted to focus on issues related

to schools, to find out how schools can create a friendly environment for immigrant students, and how they can attract young immigrants so that early school leaving rates are reduced. In our research, during informal interviews with the teachers, youth workers and authorities responsible for supporting young immigrants, we also looked more closely at the issue of early school leaving. We asked teachers about the reasons immigrant youths drop out of school. According to them, early school leaving is a process and not a one-off event. High rates of absenteeism, poor results, a lack of confidence in their own abilities, and lack of motivation for classroom activities are the factors most frequently cited by teachers for early school leaving. Their other responses included:

- *Inefficient parental support.*
- *Lack of perspectives for immigrants.*
- *Not enough quick action by schools with interventional measures.*
- *Schools could [but don't] organize compensatory activities for those with poor language skills.*
- *Schools don't undertake to contact or work with families in a timely way, when the first signs of early school leaving begin to appear.*
- *Frequent school absences.*
- *A lack of active participation in classroom activities.*
- *A lack of language skills.*
- *Poor performance and bad results in lots of subjects.*
- *Parents who do not care about their children.*
- *Family poverty.*
- *A lack of confidence in their own abilities.*
- *A lack of confidence in learning.*
- *A fear of school.*
- *Low self-esteem, low confidence in their own capacities.*

We also asked the immigrant students what they thought the reasons are for early school leaving. They told us that they and their peers do not carry on in school because of interpersonal relations and lack of motivation, as well as:

- *Unfriendly peers.*
- *Because I was tired.*
- *Too much stress that brings nothing good.*
- *There are days without any reasons, when I simply do not want to go to school at all.*
- *Because they have problems with school or have problems with people at school.*
- *They [my friends] are lazy and think that they are cool with it. But they're not all like that.*
- *Fear of their classmates, or fear of showing their parents bad grades.*
- *[Difficult] situations, problems at home that keep them away from school.*

The issue of early school leaving was further explored in a question about possible ESL prevention strategies. Teachers saw potential for schools to draw in and retain students. As one of the teachers explained: *We need to regularly present the advantages of staying in school, learning, and getting a high-school diploma*. According to the youth immigrants, education should be made attractive through school activities, for example:

- *Huge area for sport activities.*
- *Teaching methods.*
- *When there is more exercise in the classroom.*
- *By watching movies.*
- *When there is a friendly atmosphere in the school.*

Another significant issue our research focused on was intergenerational learning between young immigrants and resident seniors. We asked the youths what they would like to learn from the elderly participants of the ICT courses run under the project. Amongst other responses, they talked about learning more about the lives of the seniors in the past and now, and their life experience:

- *Nothing. (6)*
- *What it's like living in a retirement home.*
- *About their age.*
- *What gave her life in the past.*
- *What experiences they have with living in Germany.*
- *What experiences they've gained throughout life.*
- *How it was when they were young.*
- *Experiences and advice for life.*
- *Dealing with the elderly.*
- *About retirement homes.*

The adoption and use of ICT tools by seniors has consistently lagged behind that of the younger generations (Czaja et al. 2006; Zickuhr, Madden 2012). As youths become increasingly proficient with them, seniors remain at the opposite end of the digital divide (Barnard, Bradley, Hodsgon, Lloyd 2013; Charness, Boot 2009; Czaja et al. 2006). In the practical part of our research (the ICT courses), we combined intergenerational learning with learning how to use ICT. We asked the youth participants how they imagined the content of an ICT course for seniors would be. The learning issues the youths thought might occur were connected with the seniors' opportunities to interact with the younger generation. When the youths were asked what the seniors could learn from them about ICT, amongst other things they mentioned digital skills, handling of mobile devices and app use:

- *How to handle technical equipment.*
- *How to use apps.*
- *Handling the technology. (2)*
- *A lot with IT.*
- *How to handle technical equipment.*
- *About the newest IT technology.*
- *The technology of today. (3)*
- *How to handle computers.*
- *Handling tablets, mobile phones, PCs, etc.*
- *How to handle new technologies and use apps.*
- *A lot about technology.*

- *What you can do with a smartphone.*
- *How to use apps on tablets.*

Having gained some experience in intergenerational learning, after the courses the youths gave their recommendations on the best ways of interacting with seniors, for example when explaining how to use mobile devices:

- *Explain slowly and cheerfully.*
- *With cheerfulness and slow explanations.*
- *Doing the difficult things first.*
- *That you get to know the future.*
- *Have someone around.*
- *That I fool around with them and show how great it is.*
- *Maybe the seniors would like to learn something from us.*
- *She could contact family members again.*
- *Give a good explanation, or show them.*
- *Ask for help from family, over the Internet.*
- *Contact younger people [for help].*

The high motivation of the seniors was a recurrent theme for the youths, who encouraged them, for example:

- *Don't think about how difficult it is, but think about the advantages and how great it is to use ICT tools.*
- *When you know how to use a smartphone, you can contact your family using apps.*
- *With ICT, you can always contact others.*

When considering intergenerational learning, teachers talked about the need to support the cooperation between schools and local authorities in facilitating mutual contact between students and seniors, through such activities as community-based projects. For example, regular meetings between students and seniors, during which they could cook together, read or watch films. The teachers further thought that this could:

- *Strengthen the trust of young people, bind them into the local area and create a feeling of inclusion.*
- *Youth clubs and after-school activities, developed by the school, are a way of working with local organizations.*

We also asked the seniors how they perceived the role of ICT in intergenerational collaboration with students. In the seniors' opinions, intergenerational learning meant learning with each other, and about each other, with both groups supporting each other in the learning process. For example:

- *ICT is a good way of initiating contact, in which both groups benefit from learning with each other.*
- *Youths can share their technical skills with the elderly, and the elderly their experiences.*
- *We can support young people with what we know.*
- *ICT is for getting to know immigrant youths.*
- *Websites give the opportunity for conversations, during which we can learn about our countries.*

The project's intergenerational learning courses between the immigrant youths and the seniors was seen by the seniors as a way of sharing knowledge of their life, for example:

- *The youths could explain to me how the new technology works. And I could tell them something about life.*
- *In explaining how to use a device, we can get to know each other better.*
- *To talk about life in Germany and to discover Berlin, talk about culture and religion.*
- *To get to know each other, and learn about history and culture with the support of ICT.*
- *So the conversation goes both ways, you get to know each other better and both learn to appear regularly at appointments and meetings.*

The seniors also offered the young immigrants inclusion in the community, by sharing their experience of living in the area, or by introducing the young immigrants to their neighbours and facilitating contact with others. For example:

- *I can help the young people to understand the other people in the district, and vice versa.*
- *I can lead them around and introduce them to everything.*
- *I can tell my friends about my experiences with immigrant youth.*
- *I can give the young people tips on how to get along better with the others.*
- *I can tell the teenagers a lot about the district and the people.*

What was surprising to the seniors was that the regular meetings of the course were opportunities to show the youths the meaning of commitment, and to help them succeed in life:

- *By getting to know each other on the course, the young people learned to appear regularly at the meetings.*
- *I can explain how important it is for life, to graduate from school. Maybe I will be able to convince the young people that school is important.*
- *I hope I can show that experienced people, like me, can help adolescents with problems in life.*
- *This ICT course gives us the opportunity to get in touch and get to know each other. This will allow the young people to find meaning in their jobs, and I could share my experience with them.*
- *ICT is a great way to show that we can all learn from each other. Through the course, the young people can see that they can do something for others by teaching. So you might see that it brings something to learn.*

When the youths were asked what they would need to be able to learn with the seniors, they mentioned *patience, interest, open-mindedness, the ability to speak a little bit of German*, and *an interest in adult life.* When we asked the seniors what they thought they might require to learn with the youths, we got similar answers: *patience, open-mindedness, interest*, and also *a willingness to learn, understanding for young people and enthusiasm, experience*. Language was also cited (*they need to be able to speak a little German*), as well as *a willingness for conversation* (*it's important that they want to talk to me*). Before the courses started, the seniors had varying expectations. They admitted that they used smartphones mainly for communication and entertainment, but that they knew from younger generations (e.g. their grandchildren), that smartphones had other functions too, and they wanted to try them out.

- *I want to get to know new options with mobile phones.*
- *I expect to be able to deal with technical problems and to know how to solve problems.*
- *I want to learn to understand my phone a little better and build nice contacts.*
- *Smartphone understand.*

Describing the details of the course, the seniors talked about activities that fostered cooperation, and the technical skills of the elderly in general:

- *Common activities.*
- *We want help from the youths.*
- *Understanding and interest in activities conducted together.*
- *Leading conversations.*
- *To compare how the world, people and also technical issues and ICT have changed over the years.*
- *Discuss everyday technical things and new technology.*
- *How to properly operate your phone or computer, and fix small errors yourself.*
- *Show what possibilities exist and how to cope with small problems.*

During the courses (held in Germany), we noticed that the seniors wanted to share their knowledge with the younger generation, as a way of *learning with each other* about different cultures and customs, and as a way of sharing knowledge and skills. When thinking about their own resources the seniors wanted to share their knowledge, to help the youths adapt to their new country, by telling them about Berlin and German culture. They also considered their own skills when explaining what the older generations needed to know in order to interact with the immigrant youths. For example:

- *Patient when working with youths.*
- *To have the willingness and interest to teach others.*
- *To have understanding for young people.*
- *Some experience with young people.*
- *I can explain to the youths how important it is for life, to graduate from school.*

4.1.2. The intergenerational courses held in Gothenburg

The ICT Guides project was also conducted in Sweden, a country using the Scandinavian welfare state model, described by Esping-Andersen (2002: 14). As in other parts of Europe, Sweden is consistently resettling refugees, including unaccompanied minors (United Nations High Commissioner for Refugees 2015). Immigrants are resettled in Sweden in urban neighbourhoods and in government-subsidized housing, and these neighbourhoods have become places of unrest due to the social and economic marginalization of their residents (Malmber, Anderson, Osth 2013). The foreign-born population of Sweden represents 20% of its elementary and secondary school student population (Skolverket 2013; Statistiska Centralbyrån 2015), although language-minority students have a smaller chance of graduating from secondary schools and have lower literacy levels than their native Swedish-speaking colleagues (Taguma et al. 2010).

As part of the ICT Guides project, from October 2016 to June 2017 three courses were conducted in Sweden, in the Västra Hisingen District of Gothenburg, in cooperation with two schools (Ryaskolan and Sjumilaskolan), a youth recreation centre (the Svartedalsskolan centre), and three homes for the elderly (the Monsunen, Svartedalens, and Vårvinden homes). 24 students and 19 seniors took part in three courses. Data was collected from the participants, as well as from: questionnaires given to the teachers; informal interviews with seven teachers from the Ryaskolan Years 7–9 secondary school in Biskopsgården, and from five headmasters of secondary schools in Biskopsgården and the Västra Hisingen School District. Data on student health in the Västra Hisingen School District was also collected from interviews with local authorities overseeing young immigrant support services. The participants of the Swedish leg of the research project included 22 youths (8 females and 14 males) aged 12–16.
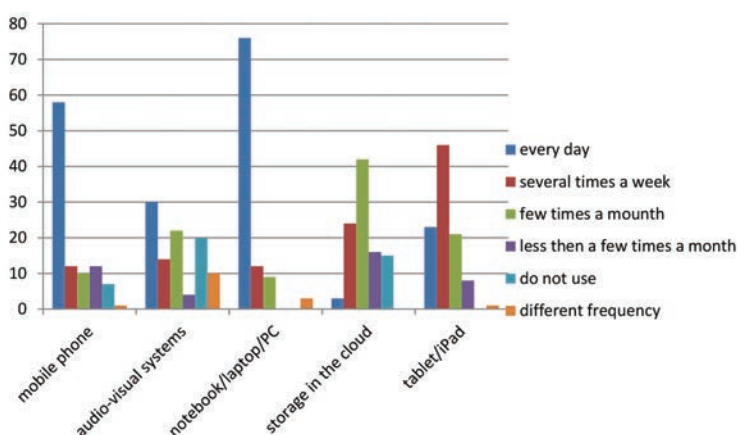

Figure 9. Frequency of ICT device use by the youths, before the course (Gothenburg)
Source: original study

One of the issues we wanted to determine with the baseline and endline surveys was what role ICT tools play in the lives of the youths and seniors. Before the courses began, we asked the youths what types of ICT devices they used and what they used them for. They replied that they used note-books, mobile phones, audio-visual systems, tablets, and online ('cloud') storage every day.

Their purposes for using mobile phones included communication, learning, and entertainment. Tablets/iPads were mostly used for learning, entertainment, communication and working or sharing together. Similarly to the tablets/iPads, notebooks/laptops and PCs were used for learning, entertainment and communication.
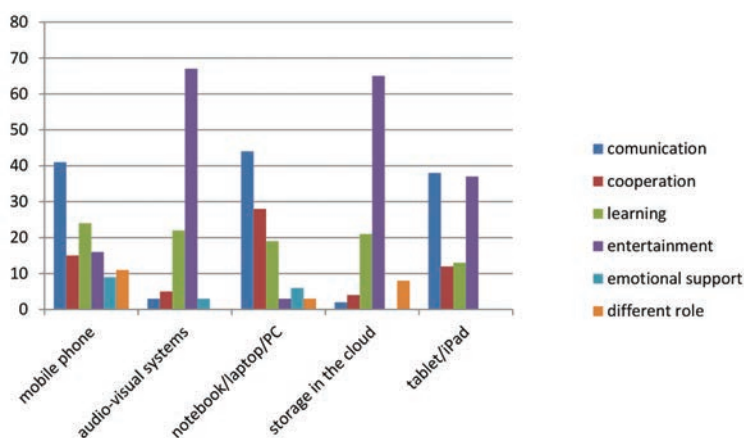
Figure 10. Purposes of ICT device use by the youths, before the course (Gothenburg)
Source: original study

For the youths in Gothenburg, the ICT Guides course was an opportunity to change their values and attitudes in different areas of life. After the course, 73% of young people stated that participation in the course had changed the role of ICT in their life. The change, however, was not that visible in their preferences for which devices they used. As before the course, so after it the use of mobile phones, notebooks, audio-visual systems, and online storage were still very popular daily activities. Also, the reasons why they used ICT devices did not change much. Mobile phones were still used by students, for communication, entertainment, mental and emotional support, and learning. Notebooks, laptops and PCs were mostly used for learning, communication and cooperation, and entertainment, while tablets/iPads were mainly used for entertainment, cooperation, and learning.

Just as with the youths, we wanted to determine the role that ICT tools play in the lives of the seniors. Before and after the course, we asked about the type of ICT tools they used and what they used them for. Before the course started, the seniors stated that they used mobile phones (87.5%), audio-visual systems

(75%) and tablets, notebooks or PCs (12.5%) every day. They used their mobile phones for communication (53.85%), sharing (23.08%), and mental or emotional support (15.38%). Similarly to mobile phones, tablets and iPads were used for communication (25%) and entertainment (16.67%). Notebooks and PCs were also popular among the seniors, and were used for entertainment and learning (25%), and communication (16.67%).

Completing the course did not change their usage preferences, or how often they used their ICT tools, compared to before the course. As before the course, the most popular tools among seniors, which they used every day, were mobile phones and audio-visual systems (57.14%), followed by notebooks (28.57%) and tablets/iPads (14.29%).
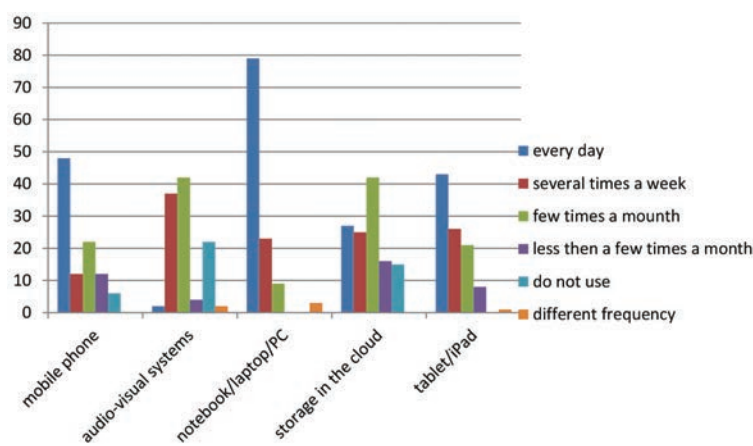
Figure 11. Frequency of ICT device use by the youths, after the course (Gothenburg)
Source: original study
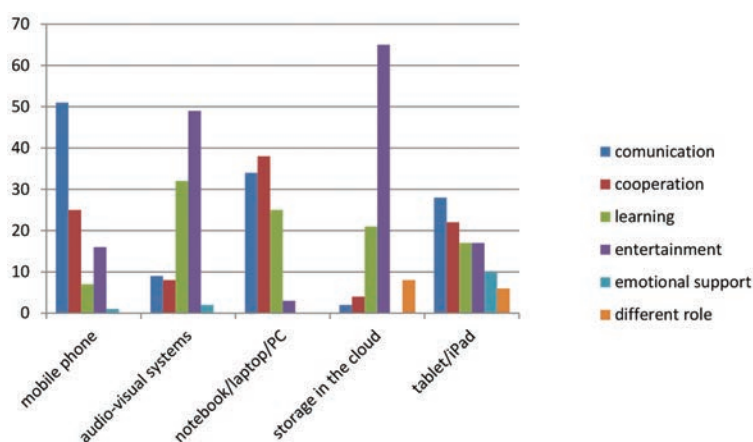
Figure 12. Purposes of ICT device use by the youths, after the course (Gothenburg)
Source: original study

**Has the role of the ICT tools in your life
changed after the course?
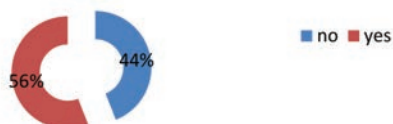PUPILS**

44%

56%

■ no ■ yes

Figure 13. Impact of the course on the lives of the youths (Gothenburg)
Source: original study

**Has the role of the ICT tools in your life
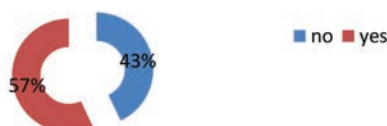changed after the course?
SENIORS**

43%

57%

■ no ■ yes

Figure 14. Impact of the course on the lives of the senior citizens (Gothenburg)
Source: original study

After the course, the role of ICT tools in the Swedish seniors' lives did not change a lot. Mobile phones were still the most popular devices for communication (77.78%), and mental or emotional support (22.22%). Notebooks and PCs were still used by the seniors for entertainment (11.11%), as well as for learning, sharing, and mental and emotional support (11.11%). Tablets/iPads, however, became more popular for entertainment and mental or emotional support (33.33%).

The differences in the seniors' preferences are visible when looking at the usage frequency. After the Swedish course, all of the participants were using mobile phones (before the course 12.5% did not use a mobile phone at all).

One of the aims of the endline survey was to find out what the youths wanted to learn from the seniors before the course, and what they actually did learn. The youths' expectations of intergenerational learning mostly lay in language and knowledge that would be useful to them when living in Sweden.

- *I wanted to speak Swedish. (x7)*
- *For me, it was important to learn the language and learn more about Sweden.*
- *…about Swedish history and learning about the seniors, and Swedish culture.*
- *I wanted to speak Swedish and learn about older people.*
- *To learn Swedish language and culture.*
- *I would like to learn not to be shy when talking Swedish.*
- *Talk Swedish and learn more about Sweden.*
- *The language. (x2)*
- *To speak Swedish and to learn about Sweden.*
- *Speak Swedish and learn about older people.*

After their last meeting of the course, the youths were asked what they felt they'd gained from their participation. In their responses, they emphasized language skills and practical information about Sweden. What was new, however, was that the students appreciated getting to know the seniors and the lives of the older generation of Swedes, which they had not expected before the course:

- *I learned how the older Swedes live.*
- *I found out about the life of the older Swedish people.*
- *I learned how they live in Sweden.*
- *How it is to live in Sweden.*
- *Swedish culture and how the seniors live in Sweden.*
- *During the course I found out about the everyday life of the older generation in Sweden, their problems and concerns.*
- *Older generation of Swedes can be nice, and it is interesting to talk with them.*
- *I learned how Swedes live in Sweden.*
- *Swedish, and how the elderly lives in Sweden.*
- *How the older Swedes live here.*

A recurrent theme in the participants' answers about intergenerational learning on the course was the exchange of knowledge of different cultures. Not only did the seniors share information about living in Sweden with the immigrant youths, but the students provided some information about their countries of origin in return. For example:

- *The seniors learned a little about my homeland.*
- *They learned to search the internet, and about Syria.*
- *Pretty much about iPads, and a little bit about my culture.*

Our research for the project was designed to determine the role of ICT in intergenerational learning. The youths' perspectives on intergenerational learning emphasised the significance of ICT tools in initial interactions ('ice-breaking'), and conversations. ICT tools gave both groups opportunities to get to know each other better, despite language difficulties. In particular, online translators helped facilitate these interactions. As the youths told us:

- *iPads were important when I met the elderly. We had something to concentrate on.*
- *I could help the older people with the apps, and we talked about iPads.*
- *iPads worked as a subject of conversation.*
- *We had something to talk about, we had of plenty conversations.*

Both the youths and the seniors told us that the ICT tools, apps and online resources had had a clear effect on their common understanding, gave them the opportunity to introduce themselves and learn about each other, and to exchange their knowledge and skills. Our research shows that throughout the courses, ICT tools used as a part of intergenerational learning change the

essence of the learning from serving as a catalyst, a trigger for intergenerational learning, towards actually facilitating intergenerational learning. Some of the opinions stated by the youths include:

- *The iPad was important in the beginning, to have something to talk about.*
- *The iPads were important during meetings with the elderly.*
- *We had something in common to talk about during the courses.*
- *Using apps like online translators, the conversations seemed to be easier.*
- *The internet offered the opportunity to talk about our lives, cultures, customs and country.*

Despite lacking a good command of the Swedish language, thanks to the use of ICT devices and online resources the youths were able to talk about their home countries with the seniors. ICT was an important tool in their intercultural learning, for exchanging information about their countries, and finding websites with pictures and videos to show each other:

- *We could travel together in the online space using an iPad.*
- *It was easier to show pictures of our home countries.*
- *It became easy to show what our homelands are like.*
- *They could show images from their lives.*
- *The elderly learned about my culture, and I learned more about Sweden thanks to the iPad.*
- *It was easier to show pictures of our home countries.*
- *Through the iPad, I was able to show my culture, and the seniors showed me Sweden.*
- *We googled together about my country, and I showed them some pictures.*

Looking at the relationship between the immigrant youths and the native seniors, the youths did not have any problems with the cultural differences. The most challenging issue mentioned was language. This is how the youths presented it:

- *The only thing that separates people is the language.*
- *I had language difficulties – you have to know some Swedish to start the conversation.*
- *The differences are mostly about language.*
- *There is not much that differs me from the Swedish seniors – mostly it is the language.*
- *We are more alike than different.*
- *There is not much that is different, maybe only the language.*

Among the youths, a significant change that we noticed after the courses was in their understanding of 'education'. Firstly, they told us that after their meetings with the seniors they realized that education was a lifelong process. Secondly, the changes were also visible in their attitudes towards learning.

- *You can learn new things when you are old.*
- *You learn new things all the time.*
- *I'm more active in my language learning.*
- *I learn more by doing.*

- *You learn new things all the time.*
- *It's always good to meet people when you want to learn things.*
- *I always want to learn new things.*
- *You need knowledge to survive in life.*
- *I want to keep learning new things.*
- *You need knowledge to succeed.*

Before the course started, we asked the seniors about their expectations of it. The seniors told us that the focus on ICT use was a learning opportunity. For example:

- *We have something in common to work with, when we meet.*
- *The device could help us share things.*
- *We can meet each other and talk about things that are new to the seniors.*
- *The course and the iPad help us to understand each other more easily.*
- *It is an easy way to learn a new language – it's easier to understand each other through Google translator.*

Another issue we asked the seniors about before the course was what their expectations of ICT are. The seniors told us about their need to develop their technical/IT skills, for example:

- *Skills development.*
- *Technical skills, like image editing.*
- *How to find out informational online language learning.*
- *As a bridge that helps to understand generations.*
- *We are looking for sources of information.*
- *We can learn how to use the different applications on smartphones.*
- *Search for information on the internet.*

The ICT tools were perceived by the seniors as an opportunity to learn about others, to get to know the youths, to establish relationships with newly-arrived immigrants and to meet and talk with them.

- *Opportunities for learning.*
- *To gain new knowledge.*
- *To meet others.*
- *We have something in common to work with when we meet.*
- *We can meet each other and talk about things that are new to us [seniors].*
- *The course can help us to share things.*
- *It is easier to understand each other.*
- *I think the device helped us to start a conversation.*
- *Digital devices gave us something to meet and talk about.*

Interestingly, in their answers to the questions about the course content, the seniors talked not only about their own needs, but also what they thought the needs of the youths would be. In the opinions of the seniors, the youths could benefit from their experience with the day-to-day reality of life in Sweden, and their knowledge of living in Sweden:

- *The youths can learn the Swedish language from us.*
- *Learning to understand two generations.*
- *I can share my life experience with the students, to help them better integrate in the neighbourhood.*
- *The course is an opportunity to meet and talk about the country where I grew up, and talk about our history.*
- *I will share my everyday life with the young immigrants. For me, meeting with them is a chance to talk.*
- *I tell them about how it was in the past – about school then, the way of life and the lack of electronics.*
- *The need for respect for adults and each other.*

After the course was over, we asked the seniors whether it had met their expectations in terms of learning opportunities. We were told that the course had been an opportunity to learn from the youths, about how to use mobile devices.

- *I learnt more about the internet/apps/Facebook.*
- *Facebook, shopping on Blocket.*
- *I know now how to search on the internet.*
- *I can now use different functions on the iPad.*
- *I know how to use an iPad, functions and communication.*
- *I can switch on the iPad and use apps.*
- *It is easy to search the internet and read newspapers online.*
- *I handle the computer better.*
- *Now I know how to use an iPad and watch online TV, and a little more about the internet.*
- *I learned all I wanted to.*
- *I know how to install apps, and send pictures and messages.*
- *I realize that I can do a lot more things digitally than before.*

As has been already mentioned, from the beginning the seniors assumed that the course would not only benefit them, but also the youths. With the questionnaire, we wanted to learn what, in the seniors' opinions, the youths learned from them during the course. They told us that the ICT tools helped the youths communicate with them, despite the language differences and difficulties, and that online resources made the cultural differences easier to explain and understand. The recurrent issue in the seniors' answers was an improvement in the youths' language and interpersonal skills when interacting with the older generation. They mentioned that:

- *The students learnt more Swedish, and this made the learning easier.*
- *They learned how to communicate in Swedish.*
- *The course gave us things to discuss.*
- *It was a good starting point for making contact.*
- *We had something in common to talk about.*
- *ICT was a common topic for us to talk about.*
- *ICT tools helped the youths overcome language difficulties.*
- *I think the device helped us start a conversation.*
- *The iPads made the contact with the students pleasant and interesting.*
- *It is so easy to connect online and talk using iPads.*
- *You can be helped by Google translate if you can´t understand each other, and can look at digital maps to learn about other countries.*

Another issue we asked the seniors about was learning with persons from different cultures. Before the course, we asked if they had any previous experience negotiating cultural differences, and then, after the course, how their experience had evolved. What was surprising was the fact that neither the seniors nor the immigrant youths perceived the issue of cultural differences as a problem. The seniors stated that they had some previous experience of interacting with people from countries all around the world, for example:

- *I used to be a football coach and met a lot of people from different cultures.*
- *I have travelled a lot in many poor countries, and met many different cultures.*
- *I lived in another country for 20 years.*

According to the seniors, their meetings with the immigrant youths on the course did not change their views about cultural issues:

- *I have the same opinion about cultural differences as I had before.*
- *The young people gave us a lot of nice experiences.*
- *I feel better with immigrants. I liked meeting the immigrant students and talked to them a lot.*
- *I meet them in my neighbourhood, and I learned a lot from the students I met on the course.*

Additionally, during the course the seniors thought that their interactions with the young immigrants became much easier than they had thought they would be, before the course started. Another change, in the seniors' opinion, was the students' increasing involvement in the course.

- *I experienced increased confidence in the students.*
- *I believe the students felt needed and got some insights about us old people.*
- *There's no doubt it was nice for them to teach us old folks.*

Another group in our focus during our research were teachers working with immigrant youths, particularly those who had had experience with immigrant youths at risk of early school leaving. These teachers were asked about the possibilities of intergenerational learning and ICT use in support of immigrant youths, and shared with us their thoughts on how to integrate the two with senior citizens, as a step towards greater social cohesion. Another issue we asked our teachers about was how to motivate youths to take part in intergenerational learning with senior citizens. The teachers advised us to leave it to the youths to decide on the content and structure of the course, which would give them more opportunities to participate by letting them take the lead. As all young people that took part in the ICT Guides project came from disadvantaged areas, had immigrant backgrounds and were all at risk of ESL, we thought that their involvement in the project would help them change their minds about leaving school too soon. According to the survey results from the teachers, schools play an important part in reducing ESL among immigrant youths in Sweden. The biggest obstacle for immigrant youths in

school is language. Thus, as one of the teachers explained, *Language must play a central role in school. In all subjects, the language must be emphasized. If you speak the language of the country you live in, possibilities open up for you.*

One of the aims of our research was to investigate the role of ICT in reducing school dropout rates. Our teachers saw ICT as an opportunity to keep students within the education system, as in certain situations ICT tools can better support the learning process. One of the teachers put it like this:

> Regardless of time, space and place, students are given the opportunity to be part of, and participate in a learning environment. There are several tools that support this, such as chat clients, e.g. PIM (Pingpong instant messenger), IMs with classmates and teachers, new ways of obtaining information (e.g. bulletin boards, weekly newsletters), school activities and knowledge components e.g. flipped classrooms, digital classrooms with lesson material such as audio files, presentations, etc. Digital devices provide the student with tools to report their knowledge levels in a variety of ways, and so formative assessment becomes a process. Through the use of Google documents, one can follow, comment on and support the learner through their learning process, making accessibility adjustments as necessary. For example, reading in several languages, using special fonts for dyslexics, and easily translating documents by pasting them into Google translate.

Other teachers stated that:

- *ICT provide students and educators with equal opportunities for continuous learning – it is a way of learning one-to-one, meaning one student with one teacher.*
- *Teachers can share lesson material and ensure that they maintain high quality through co-planning. Students can get help by watching videos produced by different teachers, explaining things in different ways and creating more variety.*
- *ICT can be a good complement to different teaching methods.*

The teachers also gave us several examples of how they used ICT in their teaching activities. These mostly involved integrating language apps and translator programmes into their lessons, for the students to improve their language skills.

- *Learning with ICT also involves the parents, as the teacher can communicate more quickly with the parents – without asking them to actually come to the school, the teacher can present them with their child's results and grades.*
- *With ICT tools, schools can gather together everything about the students' learning in a place where all educators, head teachers, students and parents can have access. Regardless of socio-cultural or religious background, disability or gender, the school has equivalence to all students.*

The teachers also saw the student-teacher relationship as essential for keeping immigrant youths in school. In the opinions of the participants, both in-school and out-of-school activities play an important role in reducing early school leaving:

- *Our role is to engage the students in learning, in the school.*
- *Perceive any student as individual, in their learning.*

- *To see the needs of students in learning.*
- *Local sports clubs can attract youths.*
- *Sports associations, libraries and youth clubs all have play important linguistic role, after the schools close for the day.*
- *Practicing language outside the school is important.*
- *In the education system, links should be made between the primary and secondary school levels to make the transition from one level to another easier.*
- *A network of native language teachers, youth police, child and adolescent psychiatrists and healthcare specialists needs to be developed – everyone needs to be included in networking around our young people to create a meaningful everyday life for them.*
- *The schools should be a meaningful place that engage students and give them hope for the future. As I see it, this is an important task for me and all school leaders.*

4.1.3. Intergenerational learning courses conducted in Madrid

Spain's location in south-western Europe on the Iberian Peninsula favours the influx of immigrants, especially from the Middle East. While there had always been immigrants in Spain, in the 1990s immigration gained more significance in demographic, economic and social terms. According to the INE (Instituto Nacional de Estadistica), Spain is home to about 6 million foreigners, or 12.1% of the country's population. The geographical location of the country is particularly conducive to the influx of illegal immigration by sea. This is the most difficult way in to the 'new homeland' of those arriving from North and West Africa (mainly Mauritania and Senegal). Many never reach their destination as they die on the journey, unable to endure such hardship. Those who succeed are often exhausted and dehydrated. Almost every day, the Spanish Guardia Civil stops people who have arrived or are trying to enter the Peninsula, or the Spanish enclave, illegally. This means that Spain, similarly to other Western European countries, is struggling to socially integrate waves of immigrants. As such, it is worth looking for solutions that will integrate immigrants into Spanish society.

At the beginning of the Spanish course, the youths were asked about their ideas of a perfect school. In their opinion, the perfect school would be well-equipped with ICT devices and would ensure good interpersonal relationships and a friendly atmosphere. Some of their answers to the question *How do you imagine the perfect school?* include:

- *With a computer for each student, and a uniform.*
- *A school where they have 15 minutes of free time.*
- *Well, one without duties, because the level of perfection varies with respect to the different points of view of each person.*
- *One with more free time.*
- *Good teachers, a little homework and more recess.*
- *One without too much pressure.*
- *One with good communication and a good atmosphere.*
- *A school in which you want to go to learn every day, in a fun and innovative way.*
- *With the best students and teachers.*

- *A perfect school would be a school in which learning would be easy to understand and there would not be so many hours of study.*
- *No, there is no perfect school because in the world there is nothing perfect.*
- *Carrying a tablet, so as not to carry so many books.*
- *With computers instead of books,*

The immigrant youths in the Madrid schools were asked about the role ICT tools play in their lives:
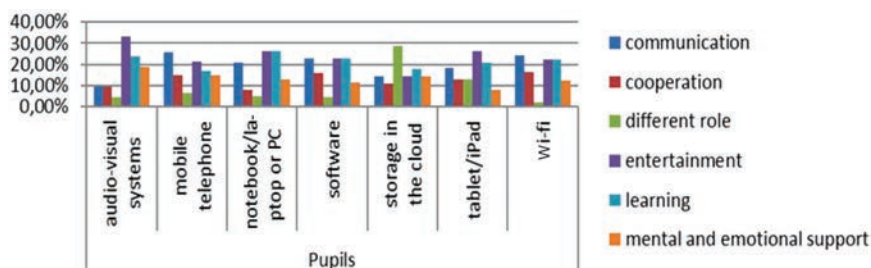

Figure 15. Purposes of ICT device use by the youths, after the course (Madrid)
Source: original study

These opinions say something important about the youths' idea of school and about their learning styles and preferences. A relatively large group of students use ICT tools to learn, communicate and as mental and emotional support. Based on these answers, it can be concluded that the use of ICT tools in intergenerational learning seems to be a good solution from the students' point of view. The answers given by the youths to the question about the frequency of use of ICT tools use were as follows.
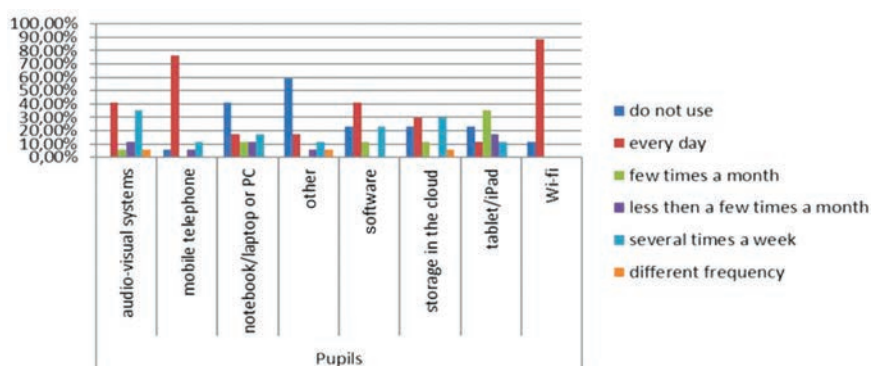

Figure 16. Frequency of use of ICT tools by the youths (Madrid)
Source: original study

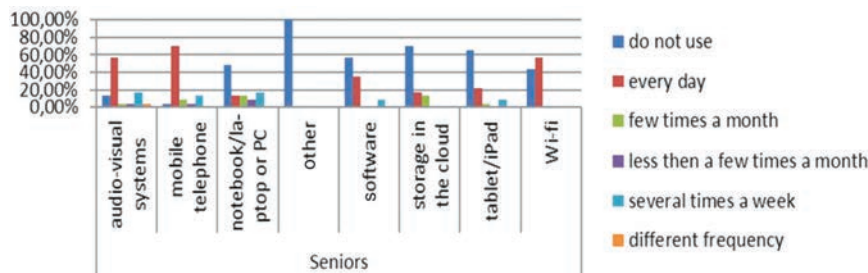The seniors on the Madrid course were also asked how often they used ICT tools.

Figure 17. Frequency of use of ICT tools by the seniors (Madrid)
Source: original study

Assuming that the students' opinions accurately reflected their actual expe-rience, it can be concluded that ICT tools can accumulate, facilitate and intensify intergenerational learning. There was little variety in the role of ICT tools in the students' lives, which means that different types of devices played similar roles. However, there was a large variety in the frequency of their use, among both the youths and the seniors. Some kinds of devices are used daily, and others only a few times a month. The youths stated that they often used mobile phones, Wi-Fi and various apps/programmes, whereas the seniors predominantly used these for 'other' purposes (e.g. for listening to the radio), which the youths did not, at all.

Generally, the participation of the students and seniors in the ICT courses had a significant effect on the role that ICT tools played in their lives, as can be seen in the graph below, and the accompanying selection of answers.
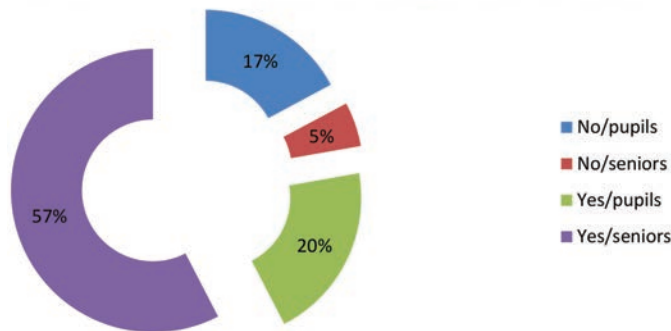

Figure 18. The role of ICT tools in the lives of the youths and seniors (Madrid)
Source: original study

Why 'Yes':

- *The tools increased their self-confidence.*
- *They were happy.*
- *I've seen them, they're very nice.*
- *It helps them meet other people.*

- *Better understanding.*
- *Because they keep them [the youths] busy and off the streets.*
- *Because they relate more.*
- *Because ICT is a medium where they can connect with their family and friends.*

Why 'No':

- [There was] *not much [change].*

Finally, to the question *What is the role of ICT tools in intergenerational cooperation (learning) in your opinion?*, they answered:

- [They're] *important. (x3)*
- *It is useful. (x2)*
- *Practice.*
- *Good so you learn to understand people.*
- *A good option.*
- *It's been a bit difficult because the woman we taught spoke English.*
- *I think it's a great idea because you can learn a lot from this type of activity.*
- *What would be better is if there were more ICT tools for learning, and not just applications.*
- *With these tools, which are useful for many other things, such as mobile.*
- *Very useful for those people who are not well integrated with new technologies.*
- *I think it's a good way to make both generations (adults and teenagers) cooperate and learn from each other.*
- *Very good! I would open it up more often, and with some prizes to motivate the young people.*
- *The truth is that it has not been very difficult, because some things I know but I still want to learn more.*

Based on a quantitative and qualitative analysis of data from the courses conducted in Spain, the following ICT functions in inter-generational learning can be identified:

- *The educational function*. This is based on the fact that ICT extends the cognitive field of learners through the wide-spread reality around them, while at the same time developing their perceptual, intellectual and executive processes. The young immigrants learned what they would not otherwise be able to in terms of history, customs, behaviour and mentality.
- *The emotional function*. This is strongly associated with the cognitive-educational function. ICT not only provokes strong intellectual experiences, but also emotions and emotional and expressive experiences, thus stimulating commitment, curiosity and interest in the teaching material. There is a close relationship between emotions and motivation. This is why ICT, affecting the emotional sphere of the human being, triggers specific motivational processes. Learning without proper emotions and motivation is ineffective (cf. the theory of three dimensions of learning developed by Knud Illeris).
- *The communication function*. This consists in the fact that ICT tools, like no other media (for example, radios), not only transmit messages, but

also enable mutual communication and dialogue that stimulates intellec-
tual development and language learning.

The intergenerational learning courses were conducted in the capital of the coun-
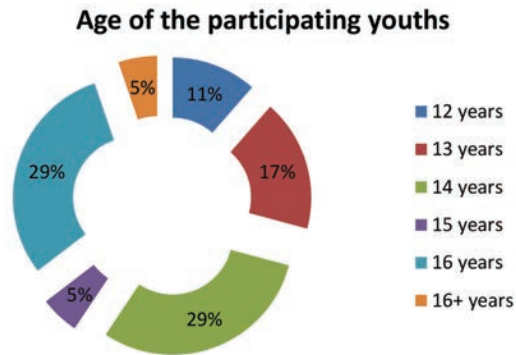try, Madrid. The age and sex of the students taking part in the course were as follows.

Age of the participating youths

Figure 19. Age of the participating youths (Madrid)
Source: original study

The largest groups of youth participants consisted of girls aged 14 and boys
aged 16. The students were working with seniors aged 60–89 (14 persons).
First, the students were asked about their expectations of the course, and then
to express their opinion after the course had finished. According to the youths'
answers, the intergenerational learning courses met their expectations:

Table 2. The youths' expectations of their own experience (Madrid)

What do you want to learn from the seniors on the ICT course?	What did you actually learn?
Know them better *Cook* *History of Spain* *Nothing special* *To be nice* *Relate better* *How things were done before to entertain themselves* *New experiences* *I don't know* *Not because I have already learned everything I wanted to know about them.* *The truth I have only learned that this genera-tion of young people is more advanced* *Experience of the elderly* *I would have liked to learn things or to share with me more knowledge* *Give advice* *Your learning and your knowledge*	*Communicate better (x2)* *New app* *New programs* *Improve relationships* *Spanish* *To help the elderly* *Life advice* *Computing* *His way of thinking when technology was not so advanced.* *My ability to teach others* *To see life in another way as they lived it* *I wanted to learn to have more patience and to explain things in a simple way, so that, in the future, it would be even easier for me to express myself* *Communication with the elderly* *I like ICT because I love computers and I would like to learn more than I know*

Source: original study

The students felt generally satisfied as both learners and as teachers. This experience could help them feel important to their local community, and build up their self-esteem. At the same time, the experience of the course could be perceived as a kind of obligation to respond in a lasting way to the past, and to take co-responsibility for the future.

Table 3. The youths' expectations of the seniors' experience (Madrid)

What do you think the seniors wanted to learn from you?	What did the seniors actually learn from you?
Manage on the internet *Use the Internet* *Work on computer* *Search information on the internet* *Use computer* *Internet* *How to use interne, make accounts and under-stand the new generation* *How to manage ICT* *Share images* *I believe that older people wanted to learn from me the use of new technologies and their use in everyday life* *My knowledge about new technologies* *To better use ICT* *To use the tic tools correctly* *My knowledge about the new technologies.* *My good to be*	*Use Skype* *To understand the technology* *More information about ICT* *What was on the sheet* *They have learned how to use and how to take advantage of new technologies.* *How advanced we are and what we can get to teach them today* *More experience of new technologies within what can be used or coped with better new formations of tic.* *My wisdom*

Source: original study

The seniors were asked the same questions.

Table 4. The seniors' expectations of their own experience (Madrid)

What do you think the youths wanted to learn from you?	What did you actually learn from the youths?
Something about how we are in Madrid *Good manners* *What I learned in my life course and also share what my experience was like* *I am not a teacher* *My way of communicating when the technolo-gy was not so advanced*	*More things (2)* *Connect me on skype* *Use internet* *Use some tools* *Look for documents, addresses of institutions ….* *Better manage the computer* *Has made better use of new technologies* *I learned to handle the mouse* *To manage a computer and be able to look for what Interests me* *I have learned to better manage ICT* *Not really because it's basic* *That technology helps us and makes learning and day-to-day easier*

Source: original study

Looking at these answers, it seems that intergenerational learning is relative in the sense that it depends on point of view, life experiences and expectations. This means that intergenerational learning is a process that is socially constituted and developed by people. Intergenerational learning helps overcome the elderly and youths' sense of isolation and feelings of being misunderstood, and helps them find themselves in a comprehensive way that can improve their family and social relations.

The ICT Guides project courses conducted in Madrid offered possibilities for mobilising the talents, skills, energy and resources of the youths and seniors. The courses helped us to see the older citizens and the students for their potential, and not as burdens. They bridged the generations, appreciating and using their unique capabilities. Intergenerational activities are part of the task of strengthening (empowering) social capital, and reducing the potential for conflict as a result of increasing segregation and age fragmentation the contemporary society.

The most important achievements of the intergenerational learning courses in Madrid included:
- strengthening the harmony between the members of two generations;
- reinforcing self-esteem and satisfaction with life among the participants;
- building social capital;
- opening a new approach in thinking about other generations, working with them, and finding our (local government's, authorities', teachers', researchers') place in these processes;
- empowering individuals and groups.

In conclusion, the courses were successful to the extent that they were carried out. The experience of running these courses is also valuable as it will help with conduct of similar courses in the future, and counteract the ESL phenomenon more effectively.

4.1.4. The intergenerational courses held in Sheffield

The United Kingdom consists of England, Wales, Scotland and Northern Ireland, which together form the United Kingdom of Great Britain and Northern Ireland. The UK is a leading financial and commercial centre, and is one of the five countries in Western Europe with a GDP of more than a trillion US dollars. In the last twenty years, the British government has significantly reduced public property and stopped the increase in social care spending. At present, British society is a multinational, ethnic, religious and cultural mix. Most of the residents are English, Welsh, Scots and Irish, but there are also many Jews, Indians, Pakistanis, Chinese, Africans and more and more Slavic peoples too, including Poles. Nearly 4/5 of the UK population live in cities in which they find employment in all types of services and industries.

Immigration numbers to the United Kingdom in the 21st century are higher than ever, and it is seen as a prime destination for people trying to get to Europe.

Although the UK has been a destination for immigrants for centuries, it has only been an immigration state for half of the 20th century (Somerville, Sriskanda-rajah, Latorre 2009). There are currently 34 communities in London Foreigners (can put it here), with more than 10,000 members. In London's schools they speak more than 300 languages. In the nine districts of Birmingham alone, the populations of ethnic minorities exceed the numbers of people/those minorities born in the country. Some researchers believe that the United Kingdom has the most liberal immigration policy, especially when it comes to reunifying families (Buonfino 2007). In 2000, the Minister for Immigration, Barbara Roche, con-firmed the results of a study that showed that in order to be competitive, eco-nomic sectors such as IT, health, education and financial services, will have to be based on migration. Total migration and refugees became the key themes of the 2005 election, when the conservatives declared that in the event of their victory, they would withdraw The United Kingdom from the Geneva Convention.

As such, since the beginning of the 21st century Britain has seen a sig-nificant increase in immigrants. This was mainly due to the opening of its bor-ders for new Member States of the European Union, followed by the so-called emigration crisis. Britain's migration policy again became the subject of public debate, while the country was one of the most hotly-contested for immigrants. Like other EU countries, the United Kingdom is experiencing difficulties integrat-ing immigrant children into society, particularly in terms of:

- Language barriers, due to ignorance or poor knowledge of the English language;
- Poor school performance, due to language ignorance, and a limited ability to communicate with peers and teachers;
- Unfamiliarity with regulations about compulsory schooling;
- Unfamiliarity with the language and culture of the country from which the students have come;
- Differences with, or ambiguity about, mutual expectations;
- Inadequate preparation of teachers and schools for working with children from other cultures;
- Difficulty in establishing emotional contact with immigrant children;
- Difficulties communicating with parents of immigrants;
- Difficulties developing educational materials.

In this context, ICT tools, intergenerational learning and empowerment all appear as ideal activities supporting the social and educational integration pro-cess. Because of this, three intergenerational learning courses were conducted in Sheffield, in the north of England. 40 respondents completed the question-naire before the courses started. After the courses, questionnaires were com-pleted by 15 respondents.

Mass media and ICT tools are a part of people's lives from the first months of their life, and are gradually becoming more important in children's devel-opment. Children and youths live in a world of mass media and multimedia, completely different to the world of previous generations. They are surrounded

by ICT tools – computers, smartphones, tablets, consoles, cable and satellite TV, the Internet – all of which all 'break into' their everyday lives. But they are undoubtedly sources of knowledge and interest, and because they allow people to communicate, explore and experience the world, ICT tools are becoming increasingly present in education.

As the research results show, ICT tools occupy an important place in peoples' lives, including those taking part in the research. 80% of students and nearly 70% of seniors in the UK use mobile phones every day. They use them not only to make phone calls, but for a range of other purposes too. Additionally, our respondents use audio-visual systems and Wi-Fi equally often:
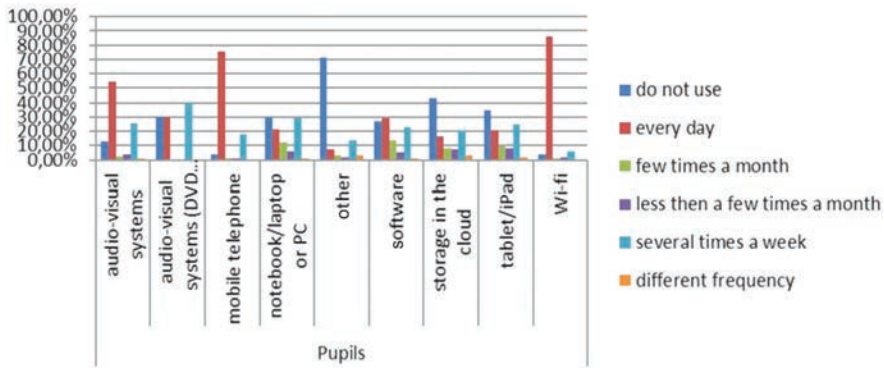

Figure 20. Frequency of use of ICT tools by the youths (Sheffield)
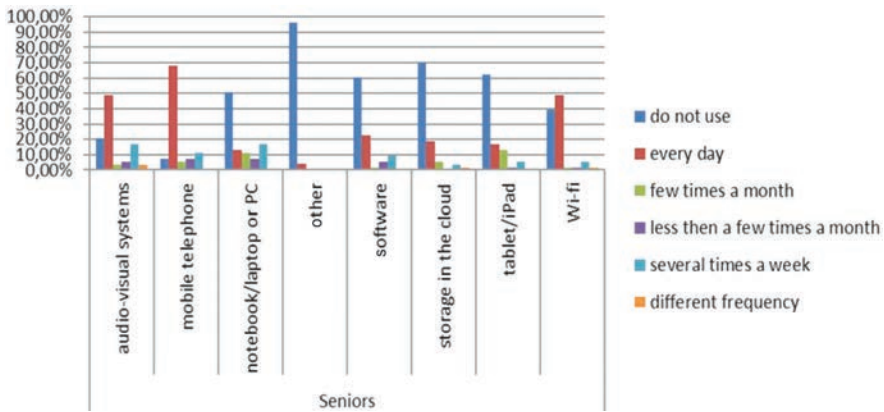Source: original study

Figure 21. Frequency of use of ICT tools by the seniors (Sheffield)
Source: original study

More specific and detailed data allow to specify the reasons for using ICT tools by students and seniors.
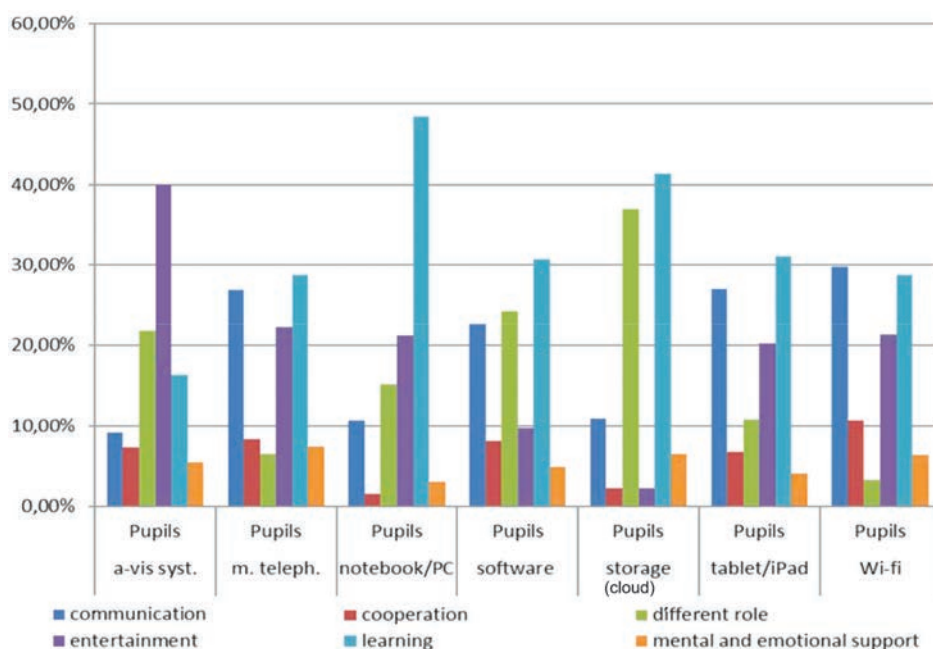
Figure 22. Purposes of ICT device use by the youths, after the course (Sheffield)
Source: original study

The role of ICT tools in the participants' lives changed after the course, for 95% of the students and seniors.

Has the role of ICT tools in your life changed after the course?
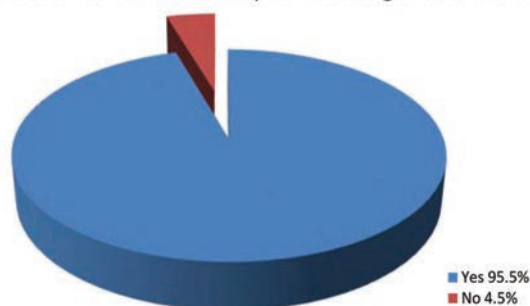
Yes 95.5%
No 4.5%

Figure 23. Changes in the role of ICT tools in the lives of the youths and seniors
Source: original study

When further asked why, they responded that:

- *We have a better understanding of ICT. (x3)*
- *It has in many ways. (x2)*
- *I am more confident to speak to people. (x2)*

- *I learn how to teach people to use ICT. (x2)*
- *Yes because we've been writing.*
- *Because we are learning more about ICT.*
- *we have better understanding of ICT.*
- *yes we have a better understanding of ICT.*
- *we have better understanding of ICT.*
- *yes we have better understanding of it.*
- *Because I found out lots of different stuff and learnt something as well.*
- *No.*
- *Learnt new stuff and skills.*
- *It has in many ways.*
- *Now I'm more careful in how I use internet and Wi-Fi.*
- *It has given me more confidence.*
- *Because I learned how to teach seniors, how to use computer.*

When asked *What is your opinion about the role of ICT in intercultural cooperation (learning)?* the participants replied: *very important* (x7); *marvellous and I enjoyed it* (x2); *because I'm shy the ICT helped me to talk to the seniors* (x2); *it helps because I can use apps like the translator*, *help me to learn English*, *it's helped me to talk to people from a different culture*. When the seniors were asked, *How can ICT help you to establish relationships with students to share with them your life experiences and wisdom?*, they gave the following answers:

- *Sharing knowledge of apps and games. Exploring information about their culture, pastimes, experience.*
- *Helping them with things they can't do and them helping us with things we have difficulty with.*
- *The students will have more experience with ICT and will be able to share their knowledge with us.*
- *It gives me an opportunity to communicate with students by asking for their advice. (x2)*
- *To get them to help us.*
- *We would need time.*
- *Have opportunities to share.*
- *It could help me but it's all over my head. My eyesight doesn't help but its good for young people.*
- *It's all new to me - but text messages would help.*
- *I would like to use a computer and it's great that young people can help – it's good for everyone even. older people.*
- *By learning from their experience.*
- *Communicate with family face to face on skype.*
- *Not answered.*
- *Talking with them.*
- *I wouldn't use it, never had access to the tools.*
- *Students can teach older people how to use technology.*
- *Helps to share experience.*
- *Photos, short pieces of narrative.*
- *Share life experiences and about my life in comparison to theirs.*
- *It's a necessary common method of communication for all age groups.*
- *Learning about each other as we work though ICT.*

The data presented above supports the idea that information and communication technologies can be used as tools supporting teaching. Their educational potential is great, but in too many cases educators, teachers and local authorities fail to use them effectively. Therefore, the initiative taken under the ICT Guides project seems to be valuable and innovative. And even if not all of the project's goals were achieved, the experience gained as part of the project implementation will certainly be useful in the future.

Intergenerational learning is a relatively new phenomenon, both in practice and in science, as its theoretical and empirical foundations are still being properly developed. The first research on intergenerational learning carried out in the 1980s and 1990s was dominated by researchers from the United States, who focused on intergenerational learning and knowledge transfer within the family. They formulated a genealogical concept of generations based on learning processes among parents, grandparents and children, and in accordance with that line of research educational programmes were conceptualized to prepare grandparents for their learning and teaching duties within the family. Learning within the family constitutes the first important research field, and there are still many questions that remain unanswered and need to be further investigated. However, there are many opportunities for intergenerational learning that take place outside the family. For example, in groups of friends, employees and even society as a whole (Schmidt-Hertha 2014: 145–154). Intuitively, we can say that any joint undertaking by people representing two different generations, consisting in sharing skills and knowledge and achieving goals, can be considered intergenerational learning. Potentially, every benefit can be perceived as a benefit of intergenerational learning, and so some clear understanding of the 'intergenerational learning' process should be presented.

In the United Kingdom, the history of research on intergenerational learning is relatively long and rich (Gert J. Biesta, Peter Jarvis). According to Biesta, who is a famous British researcher and Professor of Education at the University of Stirling, "most definitions of generation tend to follow Mannheim, but even so most generational categories tend to be rather broad, and their boundaries are fuzzy" (Biesta et al. 2010: 74–75). Biesta draws attention to the fact that the relationships between learning and generations have a long history in educational thinking, especially in terms of intergenerational transfers of knowledge and values.

Recently, the role of this learning has gained significance because of social and international changes:

> Particularly among migrant groups, inter-generational exchanges appear both to help maintain existing collective identities while simultaneously enabling adjustment to a new context. A recent qualitative socio-cultural study of children/grandparent learning among Sylheti/Bengali-speaking families in east London explored ways in which grandparents served as "founts of knowledge" that had been passed on in the past, including key social and communicative competences that older adults had not previously accessed, such as familiarity with new technologies. This study also noted the important caring role carried out by many grandparents, in a context where mothers are increasingly engaged directly in the labour market (Biesta et al. 2010: 83).

Intergenerational learning is an accepted assumption about the educational potential of intergenerational relations. It is a form of education involving two generations with the aim of achieving benefits. In the course of this activity, specific learning outcomes are produced based on relations that stimulate people to learn and develop different communication strategies. The elderly, in contact with youths, recall the ideals to which they aspired in the past. In addition, they are intellectually stimulated by this contact. For young people in contact with older citizens, their often unrealistic view of the world is strongly modified (McClusky 1990: 65–73).

The intergenerational learning during the ICT Guides courses conducted in Sheffield were based on two age cohorts: students aged 12–16, and seniors aged 60–89. Of the students, most were girls aged 14–15, whereas in the seniors, the largest group were aged 60–69.

At the beginning of the courses, the young immigrants were asked what they would like to learn from the elders. They declared that they would like to become fluent in English, to learn how to communicate with older people, and to learn something about the history of the United Kingdom. At the end of the courses, each of these aims was achieved to some extent, but the dominant effect of their intergenerational learning work was intergenerational integration. This took the form of the youths overcoming barriers to communication and finding a common, intergenerational language. This can be seen in the following answers they gave us:

Table 5. Youths' opinions of their own learning results

What did you want to learn from the seniors on the ICT course?	What did you actually learn?
How to communicate, talk English properly (3) *Lots of things around me. And how to work with the internet safety. (3)* *English language (2)* *The language (2)* *How to talk to old people* *How to talk with an old person* *How to communicate and talk English properly* *I can learn to make a game* *English Language* *English* *The past* *No* *The past* *I wanted to learn how to be good with older people* *I want learn English* *I wanted to learn how to speak English better*	*I learnt how to talk to old people (2)* *Be sure of who and when u need to use Wi-Fi or the internet to search for words vocabulary. (2)* *Some English words (2)* *Some things it's good for a future (2)* *How to talk to old people* *I learnt that old people don't use Wi-Fi* *I learnt to make a game* *Not answered* *How to talk to people* *I learnt how to talk* *how to talk to old people* *I learnt that when you are old you can retire and live in a retirement home* *No* *I learnt old people live in a retirement home (who have retired from their jobs)* *Be sure of who and when u need to use Wi-Fi or the internet to search for words vocabulary.* *I like to know about history and I learnt how the schools were when Barrie went to school* *I learnt every thing* *I practised my conversation*

Source: original study

On the other hand, asked what they would like to teach the seniors, the young immigrants thought that this would mostly be how to use ICT tools, and how to change their attitude to new technologies.

Table 6. Youths' opinions of the seniors' learning results

What do you think the seniors want to learn from you?	What do you think the seniors actually learned from you?
How to use their phones (5) *How to use the internet safety and how to use the internet on how to use search where to go find what they want. (2)* *How to use the technology (2)* *The technology (2)* *How to use their phones* *He's older than me* *How to use an iPad* *How to use a phone* *How technology works right now* *No* *How technology works now* *How to use the internet safety and how to use the internet on how to search where to go and to find what they want.* *How to use his phone better* *How to video call in messenger* *How to use modern technology*	*How to use their devices (5)* *How to use their devices (2)* *How to use their phones while searching or calling someone and even sending messages from someone who is far from them (2)* *How to use WhatsApp (2)* *F (2)* *more games* *Not answered* *How to take a picture, how to downloading stuff.* *No* *How to download stuff* *How to use their phones while searching or calling someone and even sending messages from someone who is far from them.* *I think he did learn that* *They learn how to use and practised* *About Facebook*

Source: original study

According to these responses, to a great extent the intergenerational work fulfilled the students' hopes. To understand the essence of intergenerational learning, it is important to examine the answers given by the seniors, as they offer a different perspective. From the seniors' point of view, the main goal of their intergenerational cooperation was to share knowledge with the students and teach them the skills needed in life – 'life wisdom' and not 'school wisdom'. This means that intergenerational learning does not replace school, but can support schools in their educational activities. With the seniors, a large number of them didn't answer the open questions. This could indicate that they found it difficult to comment on the subject of intergenerational learning, or that their learning outcomes were delayed. When the youths were asked the question, *Who else could make your education at school more attractive, interesting, valuable?*, they claimed their friends, parents and family would be first, and only then teachers and computers. Asked if their opinion had changed after the course, the students said it probably had.

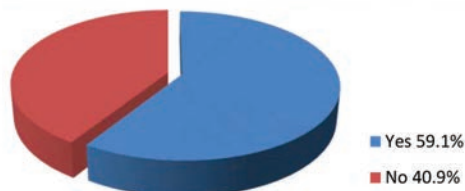## Has your opinion about education changed, since the course?

Figure 24. Youths' opinions of education (Sheffield)
Source: original study

Why?

- *Not answered (6)*
- *I have learnt a lot (2)*
- *I still believe you need school to have a better future (2)*
- *Because it helped me to be more convenient and be responsible for myself (2)*
- *I have always thought education was important (2)*
- *Its easy now after we learn more*
- *Because it helped me to be more convenient and be responsible for myself.*
- *I've always thought education is important as I want to be a pilot so I've got to work very very hard*
- *I have always thought that school is important so that I can do the job that I want to do*
- *Education has always been important to me*

With the seniors, the number of those on whom the course had had an impact was even greater.

Has your opinion about education changed, since the course?
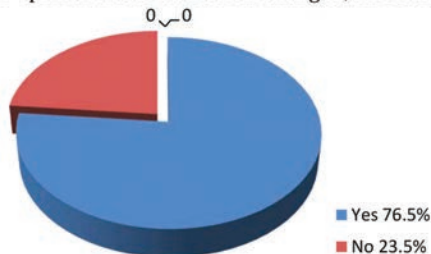

Figure 25. Seniors' opinions of education (Sheffield)
Source: original study

Why?

- *Not answered (x9)*
- *We should more*
- *Very useful to talk to different generations*
- *I already knew that it is a very good thing to happen and that there should be a lot more intergenerational activities available to young and older people.*

- *I've always been positive*
- *Because I have always thought it was good that generations should mix and integrate*
- *I was able to experience intergenerational learning first hand.*
- *It was refreshing to work with the young people would had time to help me with ICT. Whereas younger family members do not always make the time.*

Moreover, 60% of the youths expressed the opinion that the courses had been very informative, 66% said that they had been useful, and 53.3% claimed that they were satisfied with their participation in the courses.

As it is impossible to follow the students' future education and life course, it is difficult to demonstrate the long-term effects of ESL. However, it is certain that the students' experience gained as part of this project helped them find their place in their new home, and look at other people's lives from the perspective of the seniors, for whom education is one of the most important values.

4.2. General conclusions from the project

Based on the foregoing, this section provides answers to the key research questions of the ICT Guides project. First of all: *How can ICT be used as an effective tool for overcoming the polarization between youths and older citizens?*

The research carried out indicates that ICT tools are used intuitively and usually in the optimal way to achieve specific purposes. And due to their functionality, they are willingly used by both young people and the elderly. Both of these age groups are interested in using ICT because they see that the ability to use ICT tools is one of the key skills of contemporary times and that their significance will only increase in the future. However, ICT tools play different roles for these two cohorts: for the students, they are only tools for achieving relevant, specific goals. But to the seniors, ICT tools are also objects of learning. Paradoxically, this difference fosters the potential for intergenerational learning as it intrigues people and makes them interested in others. Research also shows that inability to speak the dominant language fluently, unfamiliarity with cultural codes or uncertainty as to how to cope with different social groups can sometimes be challenging for young immigrants (Fekjaer 2007). Intergenerational learning with ICT is also seen by seniors as a way of sharing information about life and personal matters. In the case of intergenerational learning, ICT makes up for the lack of good language skills by utilising text, pictures, movies, and music available online. Other elements that were helpful in learning about one another included pictures, maps, and music from online sources, which can sometimes replace language when introducing information about one's own country. In the opinion of our respondents, particularly the elderly, the course offered both generations an opportunity to get to know each other better, despite their language difficulties, with ICT serving as the facilitator of their interactions and learning (using online translators).

Therefore, ICT tools reduce intergenerational distance and allow the polarization between young and older citizens to be overcome. They should be used spontaneously in intergenerational cooperation, depending on the needs and possibilities of the participants. To intensify the work and lead it in a desirable direction, it is recommended that clear goals be set. This solution overcomes the polarization between younger and older citizens even more efficiently.

The second of the research questions posed by the ICT Guides project was: *How can ICT facilitate access to the general education system for newly-arrived immigrant children aged 12–16?*

ICT tools are being increasingly used in schools, and the ability to use them is a key competence of youth. The ICT Guides project's research results are important for understanding the students' perspective on the use of ICT tools, and the reasons for their early school leaving. It turns out that while students are proficient at ICT, they are usually not otherwise prepared for independent and effective functioning in an information society (knowledge). This is evidenced by the fact that they treat ICT as a means of entertainment and mainly use it for pleasure or out of boredom. This means that immigrant students, despite their proficiency with ICT tools, show low technological maturity. This can be defined as readiness for independent, effective and responsible use of ICT – and also innovative – and for formulating expectations about technology in terms of one's own current and future needs. This is what the satisfactory and constructive functioning of an individual in an information society looks like. In contrast, a lack of competences in this area puts them at risk of social exclusion. Competences related to ICT are important in the context of access to the broadly understood education and labour market, and they are mentioned among the most important human competences of the 21st century, the so-called key competences Raffery, Valiulis (2005: 5–7); A Report of the International ICT Literacy Panel (2007: 2–4). As a result of low technological maturity, the use of ICT tools plays an important role in the students' life and consumes time that should be dedicated to learning. During the courses conducted as part of the project, the young immigrants learned that ICT devices can be used not only for entertainment, but also for education and development. ICT enables access to almost unlimited sources of knowledge and communication. Therefore, ICT tools are very useful during the first few days, weeks and months of school education in a new country or a new social environment, when young people are facing the steepest challenges. Moreover, in our research we saw that by using ICT tools, both age groups reduced social and personal barriers and learned many things about each other. Ultimately, most immigrant students are fluent with ICT use, and this proficiency is a strength that should be leveraged by teachers in the school environment. Outside of schools, youth programmes should provide youths with opportunities to get involved in work that is relevant to them (Benson et al. 2006; Zeldin et al. 2005). One of the recurrent topics in our talks with the participants was the youths' increasing involvement in the course. They told us that the main reason for their participation was the hope of improving their language

competences. Teachers, seniors and youth workers involved in the courses talked about the immigrant students' increased confidence with the language of their new country, and in explaining issues with the use of ICT devices. Many of the newly arrived immigrant students could not yet read or speak very well – if at all –the predominant language of their host countries. On average, 63% of the first-generation immigrant students and 38% of the second-generation immigrant students spoke a language at home that differed from the language of the PISA test (PISA 2015). Our research shows that for the youths, participation in the ICT courses in all four countries changed their perception of their own communication skills and ability to talk with others. Secondly, the research shows that the intergenerational aspect of the courses did help the youths and seniors establish meaningful relationships. Third, it helped the youths answer some of their own questions, for example, about life in their new country, and its primary language.

We saw that integration of ICT tools into the schooling of the immigrants gave them the possibility to demonstrate their competences, raise their self-esteem and motivate them to become more involved in the learning process. It is important, however, that ICT tools are treated only as instruments for learning and development (teaching resources), and not as objects of learning themselves. Development of a student's sense of competence in this area is very empowering for them.

Our third main question was: *How can ICT be used as an effective tool for improving access to lifelong learning for older persons?*

The current increased interest in educating the elderly is, to a great extent, related to the progressing changes in the age structure of European Union society. But it can also be linked with the evolution of the meaning of 'education', especially with the focus shifting from teaching to learning. As a consequence of these changes, educational practices have become characteristics of everyday life. Learning is integrated with the everyday experience of individuals, which is neither always well planned nor fully realized. In the case of elderly people, education is rarely associated with teaching, as it mostly concerns learning in informal contexts. Implementation of the 'lifelong learning' idea is fostered by the development of ICT tools. New technologies are increasingly often determining our activity, communication, perception and organization of the social world, including our educational processes. Telecommunications, computer systems, the Internet and modern software have all changed our approach to life, work and education. As the research results show, ICT tools are used by young and old, both spontaneously and intuitively, but often only to achieve instrumental goals or in a useless and chaotic way that has little to do with education. Therefore, local authorities responsible for education should support, promote and organize activities for older people, showing them how to use ICT for educational purposes.

How can ICT help immigrant students aged 12–16 increase the acquisition of EU key competences, in particular communication and language skills?

The ICT Guides project courses were designed to support the development of EU key competences, especially communication and language skills. According to the participants, improvement of these skills mainly resulted from the use of ICT tools in cooperative, intergenerational work. The main mechanism for this competence development was intergenerational learning. Therefore, to increase the acquisition of EU key competences, and in particular communication and language skills, by immigrant students aged 12–16, any actions, activities or courses, etc., should involve both an intergenerational aspect, as well as the use of ICT tools. ICT tools only make educational sense when they are used in this context. Otherwise, the tools themselves become the purpose and effect of the learning, and change nothing in the lives of the students.

How can ICT contribute to a better understanding and harmonious coexistence between young immigrants and older people, both living in big cities?

ICT tools cannot replace face-to-face interactions, but they can effectively contribute to better understanding and harmonious coexistence between young immigrants and older people living in big cities. They make it possible to:
- Learn from each other – different generations share their experiences, which leads to the open exchange of knowledge, skills and competences;
- Learn with each other – joint learning about the world, society, and historical events; this is about learning facts important to members of both generations, rather than objectives;
- Learn about each other – the exchange of experiences, outlooks, values and aspirations. ICT-supported learning eliminates intergenerational and cultural distance. It helps working toward the common good, creating a sense of belonging and ensuring mutual support.

There are two main fields of research into intergenerational learning. The first focuses on intergenerational learning within related generations, with studies emphasizing the transfer of family knowledge and traditions (Büchner, Brake 2000; Brassett-Grundy 2004; Franz, Scheunpflug 2016). The second field explores intergenerational learning beyond family connections, among un-related generations (Hatton-Yeo 2006). Studies are conducted within communities such as schools, and focus on measuring the attitude of one generation towards the other. Both the youths and seniors told us that the courses definitely had an impact on their common understanding and gave them the opportunity to introduce themselves, learn about each other, and share their knowledge and skills. Our research shows that during the courses, the ICT devices changed in their essence, from serving as catalysts – the triggers for intergenerational learning – towards actually facilitating intergenerational learning. Secondly, the research shows the tendency to understand intergenerational learning as 'learning about

each other'. This was underlined by the seniors, who listed their new knowledge of ICT as being secondary to their interactions and understanding of the young immigrants. According to the immigrant youths, their knowledge of ICT gave them the confidence necessary to interact with the seniors on equal terms. ICT facilitated better interaction and understanding between them, by helping overcome stereotypes and eliminating cultural differences.

How can ICT and intergenerational learning be used to reduce ESL?

There is an emerging consensus among researchers that when young people take on roles traditionally reserved for adults, they gain a greater sense of responsibility and the ability to make a difference in their own lives and the lives of those around them (Flanagan et al. 2010; Kasumagic 2008; Rogoff 2003). Our results showed that ICT-supported intergenerational learning empowered the immigrant youths to doing better at school and working independently, without teachers. After the courses, the youths were also much more motivated to go to school. Partly, this was due to the seniors, who had tried to instil in the youths the belief that learning is a means to success in life.

In what ways and to what degree was each generational group empowered by the intergenerational learning?

The notion of empowerment can be understood in different ways, depending on the intentions expressed or implied by the user. Weber (1947), as well as French and Raven (1959), argued that different types of influence can be distinguished within the term 'social power', based on different relational factors. Power can then be defined as the ability to determine, influence, or manage the behaviour of those with whom we are in a social relationship. Power can come from: (1) expertise, in which case it means the power to do something; (2) rewards and coercive power, which is 'power on' or 'power over' someone as a reward or punishment, and (3) legitimate and referent power, which is 'power with', or a source of power in the ability to influence others and the resulting impact on others. When considering personal capacities, empowerment reflects the development of the sense of agency, self-confidence, and self-esteem, which means that one has the 'power to' do something, and the self-confidence and sufficient expertise to act. To have 'power on' or 'power over' someone or something means that the nature of the relationship, and the decisions made within it, influence the development of strategic know-how in that relationship. Collective capacities are defined as activities capable of being performed by individuals, considered collectively, in order to achieve a greater impact than they would on their own, thus developing 'power with' a group, and thus constructing a group identity and a sense of collective agency.

Summary

Our findings highlight the fact that intergenerational learning is a significant sociocultural platform for knowledge exchange and empowerment. Both the young immigrant students and older adults that participated in the ICT Guides project described their interactions as having "the power to change" their life situation, and facilitated an "exchange of knowledge" that did help them. The seniors attributed their empowerment to a desire to help the immigrant youths to improve their language skills and help them settle into their new life in their new country (empowered by their belief they can change their circumstances). The students attributed their empowerment to their existing knowledge of and skill with ICT devices, and their willingness to share that knowledge with the older generation.

BIBLIOGRAPHY

CHAPTER I

Abrams D., Eller A., Bryant J., (2006), *An Age Apart. The Effects of Intergenerational Contact and Stereotype Threat on Performance and Intergroup Bias*, "Psychology and Ageing", no. 4, pp. 691–702.

Alcock C. L., Camic P. M., Barker C., Haridi C., Raven R., (2011), *Intergenerational Practice in the Community: a Focused Ethnographic Evaluation*, "Journal of Community & Applied Social Psychology", no. 21(5), pp. 419–432.

Bandura A., (1977), *Social Learning Theory*, Prentice Hall, Englewood Cliff, New York.

Bengtson V., Biblarz T., Roberts R., (2002), *How Families Still Matter. A Longitudinal Study of Youth in Two Generations*, Cambridge University Press, Cambridge.

Bengtson V., Furlong M. J., Lufer R. S., (1974), *Time, Aging, and the Community of Social*, "Journal of Social Issues", no. 30(2), pp. 1–30.

Biesta G., Field J., Hodkinson P., Macleod F. J., Goodson I. F., (2010), *Improving Learning Through the Lifecourse: Learning Lives*, Routledge, London–New York.

Blakemore S.-J., Frith U., (2005), *The Learning Brain: Lessons for Education*, Blackwell Publishing, Oxford.

Davis L., Larkin E., Graves S. B., (2003), *Intergenerational Learning through Play*, "International Journal of Early Chilhood", no. 34(2), pp. 42–49.

Ding T., Schotter A., (2019), *Learning and Mechanism Design: An Experimental test of School Matching Mechanisms with Intergenerational Advice*, "The Economic Journal", vol. 129, issue 623, pp. 2779–2804.

Doumas D., Margolin G., John R. S., (1994), *The Intergenerational Transmission of Aggression across Three Generations*, "Journal of Family Violence", no. 9(2), pp. 157–172.

Duvall J., Zint M., (2007), *A Review of Research on the Effectiveness of Environmental Education in Promoting Intergenerational Learning*, "Journal of Environmental Education", no. 38, pp. 14–23.

Hermoso J., Rosen A. L., Overly L., Tompkins C. J., (2006), *Increasing Aging and Advocacy Competency. The Intergenerational Advocacy Pilot Project*, "Journal of Gerontological Social Work", no. 48(1–2), pp. 179–192.

Hilgard E. R., (1956), *Theories of Learning*, Appleton-Century-Crofts, INC, New York.

Jacker N. S., (1992), *Intergenerational Justice and the Family*, "Journal of Value Inquiry", no. 26(4), pp. 495–509.

Jarvis P., (2006), *Towards a Comprehensive Theory of Human Learning*, Routledge, London–New York.

Larkin E., Newman S., (1997), *Intergenerational Studies. A Multi-disciplinary Field*, [in:] K. Brabazon, R. Disch (eds), *Intergenerational Approaches in Aging. Implications for Education, Policy and Practice*, Haworth Press, New York.

Lupou R., Dorobanţu A., Fiore F., (2010), *A New Lifelong Learning Model based on Intergenerational Exchange: Premises and Foreseen Benefits*, "Procedia Social and Behavioral Sciences", no. 2(2), pp. 2761–2765.

Mannheim K., (1952), *The Problem of Generations*, [in:] K. Mannheim, *Essays on the Sociology of Knowledge*, Routledge, London.

Mazor A., Tal I., (1996), *Intergenerational Transmission. The Individuation Process and the Capacity for Intimacy of Adult Children of Holocaust Survivors*, "Contemporary Family Therapy", no. 18(2), pp. 95–113.

McClusky H., (1990), *The Community of Generations. A Goal and a Contest of the Education of Persons in the Later Years*, [in:] R.H. Sherron, D.B. Lumsden (eds), *Introduction to Educational Gerontology*, New Basic, New York, pp. 65–73.

Mead M., (1970), *Culture and Commitment: A Study of the Generation Gap*, Doubleday, Natural History Press, New York.

Mead M., (1973), *Prefigurative Cultures and Unknown Children*, [in:] P. K. Manning (ed.), *Youth: Divergent Perspectives*, John Wiley and Sons, New York, pp. 193–206.

Mezirow J., (1978), *Education for Perspective Transformation: Women's Re-entry Programs in Community Colleges*, Columbia University Press, New York.

Mezirow J., (1989), *Transformation Theory and Social Action: A Response to Collard and Law*, "Adult Education Quarterly", no. 3(39), pp. 99–107.

Mezirow J., (1991), *Transformative Dimensions of Adult Learning*, San Francisco.

Mezirow J., (1997), *Transformative Learning: Theory to Practice*, [in:] *Transformative Learning in Action: Insights form Practice, New Directions for Adult and Continuing Education*, no. 4, pp. 5–12.

Mezirow J., (2000), *Learning to Think Like an Adult. Core Concepts of Transformation Theory*, [in:] J. Mezirow and Associates (eds), *Learning as Transformation. Critical Perspectives on a Theory in Progress*, Jossey-Bass, San Francisco.

Mezirow J., (2010), *An Overview on Transformative Learning*, [in:] K. Illeris (ed.), *Contemporary Theories of Learning. Learning Theorists… in Their Own Words*, Routledge, London–New York.

Newman S., (2006), *Research and Intergenerational Studies. A Global Perspective*, "Journal of Intergenerational Relationships", no. 2, pp. 111–114.

Newman S., Hatton-Yeo A., (2008), *Intergenerational Learning and the Contributions of Older People*, "Ageing Horizons", no. 8, pp. 31–32.

Noël S., de Broucker P., (2001), *Intergenerational Inequities. A Comparative Analysis of the Influence of Parents' Educational Background on Length of Schooling and Literacy Skills*, [in:] W. Hutmacher, D. Cochrane, N. Bottani (eds), *In Pursuit of Equity in Education*, Using International Indicators to Compare Equity Policies, Springer, Boston.

Postman N., (1982), *The Disappearance of Childhood*, Vintage Books, New York.

Prettner K., Praskawetz A., (2010), *Decreasing Fertility, Economic Growth and the Intergenerational Wage Gap*, „Empirica", no. 37, pp. 197–214.

Sánchez M., Whitehouse P., Johnston L., (2017), *Intergenerational Learning and Education in Schools and Beyond*, "Journal of Intergenerational Relationships", vol. 16, pp. 106–107.

Schmidt-Hertha B., Krašovec S. J., Formosa M., (2014), *Learning across Generations in Europe*, "Contemporary Issues in Older Adult Education", Series: Research on the Education and Learning of Adults, vol. 2, pp. 239–241.

Silverstein M., (2004), *Intergenerational Relations across Time and Place*, „Annual Review of Gerontology and Geriatrics", vol. 24, pp. 123–134.

Slaght E., Stampley C. (2006), *Promoting Intergenerational Practices*, "Journal of Intergenerational Relationship", no. 4(3), pp. 73–86.

Storm R., Storm P., (2011), *A Paradigm for Intergenerational Learning*, [in:] M. London (ed.), *The Oxford Handbook of Lifelong Learning*, Oxford University Press, New York, pp. 133–146.

Tapscott M., Frick P. J., Wootton J., Kruh I., (1996), *The Intergenerational Link to Antisocial Behaviour. Effects of Paternal Contact*, „Journal of Child and Family Studies", no. 5(2), pp. 229–240.

Thomas M., (2009), *Think Community. An Exploration of the Links between Intergenerational Practice and Informal Adult Learning*, NIACE, Leicester.

Thorndike E. L., (1911), *Animal Intelligence*, MacMillan, New York.

Thorndike E. L., (1931), *Human Learning*, The Century Company, New York.

Thorndike E., (1932), *The Fundamentals of Learning*. Teachers College Press, New York.

Toffler A., (1979), *Future Shock*, Bantam Books, New York.

Vygotsky L. S., (1962), *Thought and Language*, MIT Press, Cambridge.

Vygotsky L. S., (1978), *Mind in Society: The development of higher psychological processes*. Harvard University Press. Cambridge.

Wengler E., (2010), *A Social Theory of Learning*, [in:] K. Illeris (ed.), *Contemporary Theories of Learning. Learning Theorists… in Their Own Words*, Routledge, London and New York.

CHAPTER II

Balanskat A., Blamire R., Kefala S., (2006), *The ICT Impact Report: A Review of Studies of ICT Impact on Schools in Europe*, EuropeanSchoolnet: http://ec.europa.eu/education/pdf/doc254_en.pdf (accessed: 10.05.2016).

Balanskat A., Blamire R., Kefala S., (2009), *The ICT Impact Report: A Review of Studies of ICT Impact on Schools in Europe*, European Schoolnet, Brussels.

Benson P. L., Scales P. C., Hamilton S. F., Sesma A., Jr., (2006), *Positive Youth Development: Theory, Research, and Applications*, [in:] R. M. Lerner, W. Damon (eds), *Handbook of Child Psychology: Theoretical Models of Human Development*, John Wiley & Sons, New York.

Blamire R., (2009), *ICT Impact Data at Primary School Level: the STEPS Approach*, [in:] F. Scheuermann, F. Pedro (eds), *Assesing the Effects of ICT in Education – Indicators, Criteria and Benchmarks for International Comparisons*, European Union/OECD, France, pp. 199–211.

Block F., Somers M., (2014), *The Power of Market Fundamentalism: Karl Polanyi's Critique*, Harvard University Press, Cambridge.

Brown T., Rodríguez L. F., (2009), *School and the co-Construction of Dropout*, "International Journal of Qualitative Studies in Education" 2009, vol. 22, no. 2, pp. 221–242.

Chan K. B., Loveridge D., (1987), *Refugees' in Transit': Vietnamese in a Refugee Camp in Hong Kong*, "International Migration Review", vol. 14, pp. 745–759.

Datnow A., Hubbard L., Mehan H., (2002), *Extending Educational Reform: From one School to Many*, Routledge Falmer, London 2002.

Dinh K. T., Weinstein T., Tein J., Roosa M., (2013), *A Mediation Model of the Relationship of Cultural Variables to Internalizing and Externalizing Problem Behaviour among Cambodian American Youth*, "Asian American Journal of Psychology", vol. 4, pp. 176–184.

Eurofound, (2012), NEETs – *Young People Not in Employment, Education and Training: Characteristics, Costs and Policy Responses In Europe*, http://www.eurofound.europa.eu (accessed: 16.03.2016).

European Commission, (2010), *Commission Staff Working Paper – Reducing Early School Leaving. Accompanying Document to the Proposal for a Council Recommendation on Policies to Reduce Early School Leaving*, European Commission, Brussels.

European Commission, (2010a), *Europe 2020. A European Strategy for Smart*, *Sustainable and Inclusive Growth*, Brussels.

European Commission, (2011), *Tackling Early School Leaving: A Key Contribution to the Europe 2020 Agenda*, http://eur-lex.europa.eu (accessed: 19.05.2016).

European Commission, (2011), *Youth Social Exclusion and Lessons from Youth Work*, http://eacea.ec.europa.eu (accessed: 30.05.2016).

European Commission, (2013), *Reducing Early School Leaving: Key messages and policy support*. "Final Report of the Thematic Working Group on Early School Leaving", European Commission, Brussels.

European Commission, (2013a), *Study on Educational Support to Newly Arrived Migrant Children. Webpage of European Network of Educations Councils*, Publications Office of the European Union, Luxembourg.

European Commission, (2013b), *Study on Educational Support to Newly Arrived Migrant Children*, http://bookshop.europa.eu/en/study-on-educational-support-for-newly-arrivedmigrant-children-pbNC3112385/ (accessed: 31.03.2016).

European Commission, (2014), *Youth Social Exclusion and Lessons from Youth Work*. "Education, Audiovisual and Culture Executive Agency Report", European Commission, Brussels.

European Commission, (2017), *Youth on the Move Report*, http://ec.europa.eu (accessed: 30.01.2018).

European Parliament, (2011), *Reducing Early School Leaving in the EU. Study. Executive Summary*, http://www.europarl.europa.eu (accessed: 29.05.2016).

Eurostat, (2015), Statistics about Europe 2015, www.ec.europa.eu/eurostat (accessed: 23.11.2016).

Eurostat, (2016), *Europe 2020 Indicators – Poverty and Social Exclusion*, http://ec.europa.eu (accessed: 7.01.2016).

Eurostat, (2016), *Migration Integration Statistics – at Risk of Poverty and Social Exclusion*, http://ec.europa.eu (accessed: 7.01.2016).

Eurostat Statistical Book, (2014), *Living Conditions in Europe*, Publications Office of European Union, Luxemburg.

Eurydice and Cedefop Report, (2014), *Tackling Early Leaving from Education and Training in Europe. Strategies, Policies and Measures, Education*, Audiovisual and Culture Executive Agency, Brussels.

Eurydice Report, (2013), *Education, Audiovisual and Culture Executive Agency Education and Training in Europe 2020*, "Responses from the EU Member States", http://eacea.ec.europa.eu (accessed: 19.05.2016).

Gregg P., (1998), *An inclusive Society*, Oppenheimer IPPR, London.

Hocking D. C., Kennedy G. A., Sundram S., (2015), *Mental Disorders in Asylum Seekers: The Role of the Refugee Determination Process and Employment*, "Journal of Nervous and Mental Disease", vol. 203, no. 1, pp. 28–32.

Hollifield J., Martin P., Orrenius P., (2014), *Controlling Immigration: A Global Perspective*, Stanford University Press, Stanford.

Hutchinson J., Kettlewell K., (2015), *Education to Employment: Complicated Transitions in a Changing World*, "Educational Research", vol. 57, pp. 113–120.

Jae M., Wilkinson J., Langat K., Santoro N., (2013), *Sudanese Young People of Refugee Background in Rural and Regional Australia: Social Capital and Education Success*, "Australian and International Journal of Rural Education", vol. 23, pp. 108–120.

Jo Shan Fu, (2013), *ICT in Education: A Critical Literature Review and Its Implications*, "International Journal of Education and Development using Information and Communication Technology", vol. 9, pp. 112–125.

Lally M., (2012), *Access All Areas – a Diversity Toolkit for the Youth Work Sector*. Published by NYCI and Youthnet 2012, http://www.youth.ie (accessed: 7.01.2016).

Levitas R., Pantazis C., Fahmy E., Gordon D., Lloyd E., Patsios D., (2007), *The Multi-dimensional Analysis of Social Exclusion. Bristol Institute for Public Affairs*, University of Bristol, Bristol.

Luciak M., (2004), *Minority Status and Schooling – John U. Ogbu's Theory and the Schooling of Ethnic Minorities in Europe*, "Intercultural Education", vol. 15, pp. 359–368.

Major B. N., Mendes W. B., Dovidio J. F., (2013), *Intergroup Relations and Health Disparities: A Social Psychological Perspective*, "Health Psychology", vol. 32, pp. 514–524.

Miller J., Mitchell J., Brown J., (2005), *African Refugees with Interrupted Schooling in the High School Mainstream: Dilemmas for Teachers*, "Prospect", vol. 20, pp. 19–33.

Morozov E., (2011), *The Net Delusion: The Dark Side of Internet Freedom*, Public Affairs Publishing House, New York.

OECD, (2012), Equity and Quality in Education: Supporting Disadvantaged Students and Schools, OECD, Paris.

Sheikh M., Anderson J. R., (2018), *Acculturation Patterns and Education of Refugees and Asylum Seekers: A Systematic Literature Review*, "Learning and Individual Differences", vol. 67, pp. 22–32.

Stein B. N., (1981), *The Refugee Experience: Defining the Parameters of a Field of Study*, "International Migration Review", vol. 15, pp. 2–8.

UNESCO, (2013), *Opening New Avenues for Empowerment ICTs to Access Information and Knowledge for Persons with Disabilities*, UNESCO.

UNHCR, (2016), *United Nations High Commissioner for Refugees – Mid-year trends 2016*, http://www.unhcr.org (accessed: 15.01.2019).

UNHCR, *United Nations High Commissioner for Refugees, Global Trends: Forced Displacement in 2016*, http://www.unhcr.org (accessed: 7.03.2019).

Woods A., (2009), *Learning to Be Literate: Issues of Pedagogy for Recently Arrived Refugee Youth in Australia*, "Critical Inquiry in Language Studies", vol. 6, pp. 21–32.

Zeldin S., Larson R., Camino L., O'Connor C., (2005), *Intergenerational Relationships and Partnerships in Community Programs: Purpose, Practice, and Directions for Research*, "Journal of Community Psychology", vol. 33, pp. 1–10.

CHAPTER III

Abbiati G., Azzolini D., Piazzalunga D., Rettore E., Schizzerotto A., (2018), *MENTEP Evaluation Report, Results of the Field Trials: The Impact of the Technology – Enhanced Self-assessment Tool (TET-SAT)*, European Schoolnet, FBK-IRVAPP, Brussels.

Ala-Mutka K., (2011), *Mapping Digital Competence: Towards a Conceptual Understanding*, Publications Office of the European Union, Luxembourg 2011.

Altmanová J. (ed.), (2010), *Gramotnosti ve vzdělávání: příručka pro učitele*, Výzkumný ústav pedagogický v Praze, Praha.

Avmedia.cz – *Produkty*, https://www.avmedia.cz/produkty (accessed: 19.06.2018).

Balanskat A., Blamire R., Kefala S., (2006), *The ICT Impact Report*, European School Net, https://ec.europa.eu/ (accessed: 12.10.2008).

Balanskat A., Engelhardt K., (2015), *Computing Our Future. Computer Programming and Coding. Priorities, School Curricula and Initiatives across Europe*, European Schoolnet, Brussels.

Bořecká P., (2015), *Informační centra digitálního vzdělávání (profesní rozvoj pedagogických pracovníků)*, NIDV, Praha.

Brdička B., (2012), *Jak definovat digitální gramotnost?*, https://spomocnik.rvp.cz/clanek/20549/JAK-DEFINOVAT-DIGITALNI-GRAMOTNOST.html (accessed: 05.12.2018).

Brdička B., Neumajer O., Růžičková D., (2012), *ICT v životě školy – profil školy 21*, NIDV, Praha.

Brown J. S., (2006), *Growing up Digital: How the Web Changes Work, Education, and the Ways People Learn*, United States Distance Learning Association, http://www.citeulike.org/user/suzzinha/article/104005 (accessed: 14.08.2006).

Čadílek M., Konupčík P., (2008), *Podpora učitelů a škol při tvorbě školních vzdělávacích programů*, http://boss.ped.muni.cz/pomocskole/ (accessed: 19.09.2008).

Carretero S., Vuorikari R., Punie Y., (2017), *DIGCOMP 2.1. The Digital Competence Framework for Citizens with Eight Proficiency Levels and Examples of Use*.

Churches A., (2008), *Bloom's Taxonomy Blooms Digitally*, http://teachnology.pbworks.com/f/Bloom%5C's+Taxonomy+Blooms+Digitally.pdf (accessed: 18.08.2010).

Cochard G. M., (2012), *La nécessité de la certification des compétences numériques les Certificats Informatique et Internet*. Université de Picardie Jules Verne, Université de Versailles, http://www.elearningeuropa.info/et/download/file/fid/19416 (accessed: 02.01.2012).

Digcomp, (2013), *A Framework for Developing and Understanding Digital Competence in Europe,* Publications Office of the European Union, Luxembourg.

Digital Literacy – *Libraries, and Public Policy*, (2013), http://www.districtdispatch.org/wp-content/uploads (accessed: 29.10.2013).

DistrictDispatch – *Digital Literacy, Libraries, and Public Policy*, http://www.districtdispatch.org/wp-content/uploads (accessed: 05.12.2018).

Dixon B., (2013), *Anytime Anywhere Learning*, http://www.aalf.org/ (accessed: 19.05.2018).

EUA, (2018), https://eua.eu/ (accessed: 19.03.2019).

Eurashe, (2018), https://www.eurashe.eu/ (accessed: 20.04.2019).

Evropská komise, (2017), *Digital Competence Framework for Educators – DigCompEdu*, https://ec.europa.eu/jrc/sites/jrcsh/files/digcompedu_leaflet_en-2017-10-09.pdf (accessed: 09.10.2017).

Ferrari A., (2012), *Digital Competence in Pracite: An Analysis of Frameworks,* Publication Office of the European Uninon, Luxembourg.

Ferrari A., (2013), *DigComp: a Framework for Developing and Understanding Digital Competence in Europe*, http://bit.ly/1pm1qya (accessed: 19.06.2016).

Flanagan L., Jacobsen M., (2003), *Technology Leadership of the Twenty-first Century Principal*, "Journal of Educational Administration", vol. 41, no. 2, pp. 124–142.

Fojtík R., (2007), *M-Learning*, http://www1.osu.cz/~fojtik/doc/icte2005.pdf (accessed: 07.04.2007).

FutureLab, (2010), *Digital literacy across the curriculum: a Futurelab handbook,* http://www.futurelab.org.uk/sites/default/files/Di (accessed: 23.05.2018).

Gartner.com, (2015), *Leading in a Digital World,* http://www.gartner.com (accessed: 06.12.2015).

Gartner.com, (2018), https://www.gartner.com/en (accessed: 11.05.2019).

Georgiev T., Georgieva E., Smrikarov A., (2006), *M-learning. A new stage of e-learning*, http://ldt.stanford.edu/~educ39106/articles/m-learning.pdf (accessed: 14.11.2006).

Hanson K., (2012), *Virtual Private Cloud Computing vs. Public Cloud Computing*, "Cloud Computing Journal", http://cloudcomputing.sys-con.com/node/2230961 (accessed: 27.10.2012).

ICILS 2013 – *Mezinárodní výzkum počítačové a informační gramotnosti*, http://www.icils.cz (accessed: 05.02.2018).

Innovating Pedagogy 2013 – 2016 – *Open University Inovation Report*, http://www.open.ac.uk/blogs/innovating/

Kocián F., (2013), *Využití Cloud computingu pro neziskové organizace*, http://theses.cz/id/f9dovi/ (accessed: 09.11.2013).

Lacko Ľ., (2012), *Osobní cloud pro domácí podnikání a malé firmy*, Computer Press, Brno.

Leipert J., (2012), *Paradigma Cloud learning technologií v kontextu aktuální informační gramotnosti.*

Lorenzová J., Svoboda P., (2018), *Advantages and Risks of Socializing Young People on the Internet*, IATED Academy Press, Valencia, pp. 6625–6629.

Lustig F., (2008), *Problematika vzdálených a virtuálních laboratoří* v *distančním vzdělávání*, http://pf.ujp.cz/CCV/ext/konference_2014/Lustig_14.pdf (accessed: 11.09.2008).

Lynda, (2018), https://www.lynda.com/ (accessed: 10.06.2019).

Martin A., (2008), *Digital Literacy and the Digital Society*, "Digital Literacies: Concepts. Policies & Practices", pp. 151–176.

Martinková A., (2010), *Spolupráce vysoké* školy *se základními a středními školami při integraci interaktivní tabule do vzdělávání*, ERIE, Praha.

Mediaplanet, (2013), *Cloud Computing*, http://doc.mediaplanet.com/all_projects/13204.pdf (accessed: 02.02.2014).

Mesarošová M., Cápay M., (2014), *Competences for Teaching in Modern Society*, "Technológia vzdelávania. Vědecko-pedagogický časopis", vol. 15, no. 2, http://www.technologiavudelavania.ukf.sk (accessed: 10.02.2014).

m-learning.org, (2011), *Blended Learning*, http://www.m-learning.org/m-learning-in-action/m-learning-in-action-2.htm (accessed: 04.01.2011).

MPSV, (2017), *Strategie digitální gramotnosti ČR na období 2015 až 2020*, http://www.mpsv.cz/files/clanky/21499/Strategie_DG.pdf (accessed: 20.03.2018).

MŠMT, (2018), *Strategie digitálního vzdělávání do roku 2020*, http://www.msmt.cz/file/34429/ (accessed: 12.11.2014).

Mynaříková L., Svoboda P., Jirkovská B., Lorenzová J., (2019), *Barriers of Secondary School Teachers in the Use of ICT for Teaching*, ICERI2019, IATED Academy, Valencia, pp. 2426–2431.

National Center for Education Statistics, (2013), *Professional Development: Teachers' Need for Professional Development,* https://nces.ed.gov/surveys/talis/talis2013/talis2013results_3b.asp (accessed: 19.01.2016).

Neumajer O., (2013), *Trendy ve vzdělávání s ICT v roce 2013*, Sborník příspěvků, Nové Město na Moravě.

Neumajer O., (2017), *Být digitálně gramotný už neznamená jen ovládat počítač*, Řízení školy, Praha.

New Media Consortium, (2016), *Horizon Report 2016*, https://www.nmc.org/nmc-horizon/ (accessed: 07.04.2018).

OECD, (2015), *New School Management Approaches*, OECD, Paris.

Open University Innovation Report, (2017), http://www.open.ac.uk/ (accessed: 28.04.2019).

OSN pro vzdělání, vědu a kulturu, (2011), *Další vzdělávání učitelů*, https://publi.cz/books/220/files/ KMU.pdf (accessed: 21.08.2015).

Peters K., (2005), *Learning on the Move: Mobile Technologies in Business and Education*, Brisbane: Australian Flexible Learning Framework.

Prensky M., (2001), *Digital Natives, Digital Immigrants*, "On the Horizon", vol. 5, no. 9, pp. 119–128.

Průcha J., (ed.), (2009), *Pedagogická encyklopedie*, Portál, Praha.

Rambousek V., (1991), *Technické výukové prostředky*, SNP, Praha.

Revenda V., (2014), *Trendy využívání ICT ve školách*, http://hnedulkov.cz/hnedulkov/text/et/index. htm (accessed: 22.11.2014).

Rychlík J. (ed.), (2013), *Cloudy a cloudová řešení*, Západočeská univerzita, Plzeň 2013.

Schiller J., (2013), *Working with ICT: Perceptions of Australian principals*, "Journal of Educational Administration", vol. 41, no. 2, pp. 171–185.

School Education Gateway – Evropská internetová platforma pro školní vzdělávání. (2017), *Získat digitální kompetence – úkol pro občana 21. století*, https://www.schooleducationgateway.eu/cz/ pub/experts/riina_vuorikari_-_becoming_dig.htm (accessed: 05.06.2018).

Šeďová K., Zounek J., (2013), *Web o změnách ve vzdělávání.* "*Učitelské listy*", vol. 3, pp. 2–4, http:// www.ucitelskelisty.cz/Ucitelskelisty/Ar.asp?ARI=103437&CAI=2151 (accessed: 20.02.2008).

Straková J., (2007), *Moderní vyučování: Výběr z překladu*, http://www.modernivyucovani.cz/ (accessed: 02.02.2008).

Svoboda P., (2008), *M-learning ve výuce technických předmětů*, Gaudeamus, Hradec Králové.

Svoboda P., (2015a), *Podpora cloudových řešení pro oborové didaktiky, on-line nástroje pro komunikaci a sdílení námětů, inspirací*, NIDV, Praha.

Svoboda P., (2015b), *Cloudové datové a komunikační prostředí pro sdílení a připomínkování materiálů pro potřeby školy*, NIDV, Praha.

Svoboda P., (2015c), *Role ICT metodika ve škole cloudová řešení – teoretický základ*, NIDV, Praha.

Svoboda P., (2016), *M-learning – Use of Mobile Technologies in Teaching*, "Littera Scripta", vol. 3, no. 9, pp. 96–109.

Svoboda P., (2017), *Assumptions and Reasons for the Use of Digital Technologies in Education*. "Studia Pedagogiczne", vol. 1, no. 50, pp. 195–206.

Svoboda P., (2018), *Digitální kompetence a digitální technologie v současné škole*, "Media4u Magazine", vol. 1, no. 15, pp. 2–27.

Svoboda P., (2019a), *A New Educational Program of Digital Competences Development for Teachers*, Centre for Higher Education Studies, Prague.

Svoboda P., (2019b), *Digital Technology as a Significant Support for the Teaching Process*, IHIET 2019, Springer, Nice, France 2019, pp. 383–389.

Svoboda P., (2019c), *Innovative Didactic Tools in Education*, ICETI 2019, International Institute of Informatics and Systemic, USA, Florida, pp. 53–57.

Svoboda P., (2020), *3D Multi-User Virtual Environments in Education*, IHIET 2020, Springer, Lausanne, Switzerland.

Svoboda P., Andres P., (2017a), *Multimedia as a Modern Didactic Tool – Windows EDU Proof of Concept Project at CTU in Prague*, Springer (Advances in Intelligent Systems and Computing), London, pp. 29–40.

Svoboda P., Andres P., (2017b), *Nové technologie ve výuce*, "Media4u Magazine", vol. 1, no. 15, pp. 35–40.

Svoboda P., Andres P., (2020), *Development of Digital Competences of Teachers of Social Sciences at Secondary Vocational Schools*, ICL2018, Springer, Cham, pp. 720–731.

Svoboda P., Vališová A., (2018), *Higher-Education Teacher in the Context of his Professional Competency*, "Studia Edukacyjne", vol. 1, no. 50, pp. 241–256.

Svoboda P., Lorenzová J., Jirkovska B., Mynaříková L., Vališová A., Andres P., (2020), *Research of Teachers' Digital Competences in an International Context*, ICL2019, Bangkok, Thailand, Springer, Cham.

Tocháček D., (2010), *Výzkum STEPS – study of the impact of Technology in Primary Schools*, VÚP, Praha.

UNESCO and Microsoft, (2011), *Unesco ICT Competency Framework For Teachers*, http://www.unesco.org/new/en/unesco/themes/icts/teacher-education/unesco-ict-competency-framework-for-teachers/ (accessed: 15.09.2012).

Vališová A., (2005), *Teacher Training – Alternative Approaches (the Social Competence of Teachers-Engineers)*, Yeditepe University, Istanbul, pp. 257–260.

Vališová A., Svoboda P., (2018), *Vysokoškolský učitel v kontextu jeho profesní kompetence,* Ostravská univerzita, Ostrava, pp. 89–100.

Vališová A., Svoboda P., Andres P., (2016), *Application of ICT at Contemporary Schools in the Czech Republic,* Scholla, Prague, https://spark.adobe.com/page/7ohkpMA0lD2Wl/, pp. 75–78.

Velte A. T., Velte T. J., Elsenpeter R. C., (2011), *Cloud Computing: praktický průvodce*, Computer Press, Brno.

Videoukázka – český jazyk, 3. ročník ZŠ praktická. Využití m-technologií iPad, http://www.youtube.com/watch?v=7BaRulsbLJ0&feature=youtu.be (accessed: 10.05.2012).

Videoukázka – *matematika, 5. ročník ZŠ speciální. Využití m-technologií iPad*, http://www.youtube.com/watch?v=eGYNjHWtEFA&feature=related (accessed: 10.05.2012).

Videoukázka – *využití ipad*, numerato.posterous.com/tablety-ve-vyuce-vyber-vzdelavacich-aplikaci (accessed: 10.05.2012).

Vuorikari R., Punie Y., Carretero Gomez S., Van Den Brande G., (2016), *DigComp 2.0: The Digital Competence Framework for Citizens. Update Phase 1: The Conceptual Reference Model,* Luxembourg Publication Office of the European Union.

VUPPRAHA.CZ., (2008), *Výzkumný ústav pedagogický v Praze. Efektivní vzdělávání, ale ne pro každého*, http://www.vuppraha.cz/media/493 (accessed: 20.10.2008).

Vymětal J., Diačiková A., Váchová M., (2005), *Informační a znalostní management v praxi*, LexisNexis CZ s.r.o., Praha.

Webber C. F., (2003), *New Technologies and Educative Leadership*, "Journal of Educational Administration", vol. 41, no. 2, pp. 119–123.

The World Economic Forum, (2018), https://www.weforum.org/ (accessed: 26.04.2019).

Yuen A. H. K. et al., (2003), *ICT Implementation and School Leadership: Case Studies of ICT Integration in Teaching and Learning*, "Journal of Educational Administration", vol. 41, no. 2, pp. 158–170.

Zaoral O., (2006), *Palm OS podrobně a prakticky*, Nakladatelství GRADA, Praha.

CHAPTER IV

Büchner P., Brake A. (eds), (2006), *Bildungsort Familie: Transmission von Bildung und Kultur im Alltag von Mehrgenerationenfamilien*, VS Verlag für Sozialwissenschaften. Wiesbaden.

Brassett-Grundy A., (2004), *Family Life Illustrated: Transitions, Responsibilities and Attitudes*, [in:] T. Schuller, J. Preston, C. Hammond, A. Brassett-Grundy, J. Bynner (eds), *The Benefits of Learning. The Impact of Education on Health, Family Life and Social Capital*, Routledge Falmer, London.

Buonfino A., (2007), *Integration and the Question of Social Identity', Immigration and Integration: A New Centre Left Agenda*, Policy Network, London.

Corbin J. M., Strauss A., (1990), *Grounded Theory Research: Procedures, Canons, and Evaluative Criteria*, "Qualitative Sociology", no.13(1), pp. 3–21.

Creswell J. W., (2012), *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*, SAGE Publications, London.

Esping-Andersen G., (2009), *The Incomplete Revolution*, Polity Press, Cambridge.

Fekjaer S., (2007), *Inclusion and Exclusion of Young Adult Migrants in Europe: Barriers and Bridges*, Routledge, London.

Flanagan C., Stoppa T., Syvertsen A., Stout M., (2010), *Schools and Social Trust*, [in:] L. Sherrod, J. Torney-Purta, C. Flanagan (eds), *Handbook of Research on Civic Engagement in Youth*, Wiley, New York.

Franz J., Scheunpflug A., (2016), *A Systematic Perspective on Intergenerational Learning: Theoretical and Empirical Findings*, "Studia Pedagogica", no. 21(2), pp. 25–41.

French J., Raven B., (1959), *The bases of social power*, University of Michigan, Michigan.

Hatton-Yeo A., (2007), *Programas intergeneracionales, solidaridad intergeneracional y cohesión social' (Intergenerational Programs, Intergenerational Solidarity and Social Cohesion*), [in:] M. Sánchez (ed.), *Hacia Una Sociedad Para Todas las Edades. La Vía de Los Programas Intergeneracionales*, Fundación La Caixa, Barcelona.

Kasumagic L., (2008), *Engaging Youth in Community Development*, "International Review of Education", no. 54, pp. 375–394.

Knoblauch H., Baer A., Laurier E., Petschke S., Schnettler B., (2008), *Visual Analysis. New Developments in the Interpretative Analysis of Video and Photography*, "Forum: Qualitative Social Research", vol. 9, pp. 1–15.

Malmberg B., Andersson E., Östh J., (2013), *Segregation and urban unrest in Sweden*, "Urban Geography", 34(7), pp. 1031–1046.

Mannheim K., (1929), *Ideologie und Utopie*, Cohen, Bonn.

Robinson P., Oppenheim C., (1998), *Social Exclusion Indicatiors: A submission to the social exclusion unit*, IPPR: London.

Rogoff B., (2003), *The Cultural Nature of Human Development*, Oxford University Press, New York.

Skolverket (*Swedish National Agency for Education*) (2013), *The Swedish education system*, http://www.skolverket.se/omskolverket/andra-sprak-och-lattlast/in-english/the-swedish-education-system (accessed: 05.06.2018).

Sommerville W., Skriskandarajah D., Latorre M., (2009), *Citizenship in Transition: New Perspectives on Transnational Migration*, Cambridge Scholar Publishing, Cambridge.

Statistika Centralbyran (2015), Statistikdatabasen, https://www.scb.se/ (accessed: 05.06.2018).

Taguma M., Kim M., Brink S., Teltemann J., (2010), *OECD Reviews of Migrant Education*, OECD, Sweden 2010.

Valentine, Marsh, Pattie, (2005), *Gender Balance and Gender Bias in Education: International Perspectives*, Routledge, London.

Valtonen K., (1994), *The adaptation of Vietnamese refugees in Finland*, "Journal of Refugee Studies", 7(1), pp. 63-78.

Weber M., (1947), *The Theory of Social and Economic Organization*, Oxford University Press, New York.

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