

LEARNING ENVIRONMENT FOR ADULT LEARNING AND EDUCATION

Literature Review

EXECUTIVE SUMMARY

The main purpose of this research report was to provide an overview and synthesis of the current expertise dealing with innovations at LENV in ALE. In this regard, we have done:

1. an extensive analysis of articles published between 2010 and 2020 indexed in Scopus (Elsevier) and Web of Science (Clarivate Analytics) databases, based on which we identified major trends in the research about innovations in the adult learning environment;
2. we subsequently supplemented this analysis with the results of additional analysis of key international literature from the last five years, which deal with adult education and lifelong learning. Due to that, we have expanded the original overview of information sources and included findings from book publications, research reports and documents, including current OECD and UNESCO documents;
3. last but not least, we supplemented our research report with examples of good practice in the development and improvement of LENV for adults, which are mainly based on projects focused on ALE indexed in CEDEFOP (2020), EPALE (2020) and ERASMUS + (2020) databases.

The results obtained in this way are an overview of crucial trends in the current literature, which deal with this topic (see Chapter 5), and an overview of key factors (phenomena, tools and measures) that affect the quality and effectiveness of LENV. In the spirit of the partial-aims of this report, we have divided them into three levels at which we deal with innovations, i.e. the key factors influencing LENV at the micro-level of adult learners (Chapter 6), at the meso-level of organizations and educational courses/training (Chapter 7), and at the institutional macro-level (Chapter 8).

Below you can find a basic summary of our results, which shows how LENV for ALE is conceptualized today and what are the emerging topics and issues associated with it.

Trends in scholarly discourse

When creating a basic overview map of the research focused on LENV for ALE, we came to the following findings:

1. This is a new research field that is highly fragmented. Rather than being an integrated and knowledge-based research program or a theoretically framed approach, it is a multi-disciplinary research field where researchers explore various aspects of LENV, but mostly in isolation, without their interaction and mutual influencing. As a result, knowledge is highly fragmented and does not yet allow for significant accumulation, especially about the relationship among different aspects of LENV – in terms of their interaction and co-constitution, which would lead to the a deliberate creation of quality and inclusive LENV for different groups of adults.
2. The predominant focus of the current research lies in the study of LENV innovations in formal educational settings. There are far fewer articles on LENV in NFE and INFOL, and these are strongly focused on one of the elements of the learning environment, not on LENV as a whole.
3. University students and persons with a high level of education aged 18 to 35 are over-represented in the research, which may have significant consequences for the actual impact of innovations on these adults as well as on their transferability to LENV intended for other social groups – e.g. socially disadvantaged people and adults with lower levels of basic skills (functional literacy).

4. Innovations in LENV are most often associated with the application of DOL elements as tools enriching new sources of learning and liberating the traditional adult learning environment from temporal and space dependence. A strong orientation of the discourse to new technologies and digitization is obvious there.
5. As for the focus on one of the levels of educational reality, most studies orient on the micro- and meso-levels. They mostly deal with the learners and the environment of specific educational courses, training, or educational events/interventions. Much less attention is paid to the meso-level of work organizations which are becoming more and more the core of adult education today (Boeren et al., 2020; Rubenson, 2018) and where INFOL has an increasingly important position (Massman et al., 2018; Paine, 2019; Wheeler, 2019). Furthermore, little emphasis is placed to the macro-level of LENV, such as the role of the state, political institutions and measures to promote overall inclusiveness in ALE, which is currently predominant in ALE political economy debates (Busemeyer, 2015; Desjardins & Ioannidou, 2020). For these reasons, we also had to expand the originally defined framework of the scholarly literature in the two mentioned sub-fields and make use of texts from workplace learning research and adult education policy.
6. In addition to these two significant blank spaces, we can point out four other limits: (a) over-representation of young adults with a high level of education in the analysed studies; (b) a small proportion of studies carried out on a representative sample of the population or on the basis of controlled experiments; (c) a strong orientation to a formal learning environment - innovations in LENV then appear as a process of “de-formalization” of the traditionally school-based learning environment; (d) focusing on technology-oriented innovation, especially on new sources and organizational forms of adult learning (for more details, see Chapter 5).

Micro-level factors influencing LENV for ALE

The key factors influencing the creation of effective LENV for adults at the micro-level are related to the question of how the individual characteristics of adults are taken into account in its creation and setting. In this regard, various studies conclude that an educational needs analysis should cover a wide range of areas in which LENV can be tailored to specific individuals, groups and, where appropriate, entire organizations.

We believe that with a little simplification, these characteristics can be divided into two initial sets. On the one hand, it is the values and meanings of ALE for individuals (sociocultural orientation in relation to ALE) and on the other hand, it is the level of skills and learning styles (cognitive and metacognitive predisposition to ALE).

The values and meanings of ALE are fundamentally marked by a person's previous experience with education. Subsequently, they are also reflected in the formation of attitudes, motivation, and expectations regarding the form and quality of LENV and the benefits of further education. On the contrary, skills include the preconditions for adults to learn actively and successfully in the NFE and INFOL. However, it is not the specific job-related skills associated with a particular profession, but the ability of an adult to learn and manage their learning as well as the basic elements of digital functional literacy.

To map the value and meaning orientation of individuals to ALE, various tools can be used that we described in Chapter 6 and which focus on:

- identification of previous learning experience (educational biography);

- identification of attitudes to education;
- identification of motivation to ALE;
- identification of the learners' expectations regarding LENV.

Conversely, in order to set up LENV on the basis of skills and learning style, various studies focus on:

- identification of self-directed/self-regulated learning levels of skills;
- identification of DOL self-efficacy and digital skills;
- identification of learning styles;
- identification of adults' self-concept of learning.

Along with the identification of educational needs, the current scholarly discourse emphasizes the systematic stimulation of motivation. A continuous enhancement of motivation leads not only to a higher participation of adults in lifelong learning, but also to a higher level of achievement of the learners' goals and to a willingness to participate in ALE again in the future.

Meso-level factors influencing LENV for ALE

In the organization and implementation of the learning process itself, two groups of factors are important. The first group includes more general features of the learning environment, which include both non-job-oriented training and job-oriented training and which are mainly linked to the organization of NFE-based training courses, while the second group of factors is much more strictly linked to the work environment as a place of learning, and more with INFOL rather than with NFE.

The first group of factors includes the emphasis on the use of principles: personalization of LENV, collaborative forms of learning, experiential learning, and the massive use of DOL as a way to expand LENV and make it flexible. Due to personalization, the learning environment can be tailored to individuals and groups. The above-described analysis of educational needs serves for such optimization.

Collaborative and experiential learning not only increases the relevance of adult education, but also expands the repertoire of skills that individuals acquire during learning making it more interesting and appealing for them to continue.

The use of DOL within ALE is one of the most frequently described procedures for innovating and supplementing LENV. Despite its high efficiency for storing and sharing an almost infinite number of information resources, educational content, and the ability to free learning from the dependence on time and space, it also encounters various practical barriers. First and foremost, it is the readiness of adults to use DOL for their self-learning (INFOL), or to participate in NFE that is organized through it. What is important is the input DOL skills which are very unevenly distributed in the population. Therefore, many authors (Boeren et al., 2020; Merriam & Baumgartner, 2020; Wheeler, 2019) point out that learning based on new technologies benefits especially those who already have a higher level of education and use these technologies in their daily work. Secondly, it is the DOL format itself which often places higher demands on the self-regulation of adults and their motivation, and these demands may contribute to reducing their interest in learning.

In addition to these features, other factors of the ongoing support of the learners are being much discussed in the context of LENV for adults, such as instructions, learning support and feedback,

which should help maintain the learners' motivation and help shape positive emotions associated with the learning process.

A separate issue is the new content of learning, which has emerged in the last decade and which is an important new trend in ALE. This includes the emphasis on self-regulated and self-directed learning skills, teamwork, social skills, ICT skills and the ability to concentrate/be present (mindfulness). All of them are in fact key generic skills that are necessary for adults to be able to learn independently and effectively and adapt to the changing work and social environment of the 21st century.

If some of the above features are included in LENV, its quality increases – i.e. they act as accelerators of adult learning and contribute to its long-term sustainability.

In addition to these general features, the dynamically developing field of job-oriented learning includes several fundamental mechanisms with which can increase the positive impact of the work environment such as LENV for adults. It is the formation of the culture of a learning organization which enables the principle of mutual learning and its connection with the strategy of the organization, a building block of organizational culture and an adaptable organization. It is followed by establishing INFOL in the form of social learning as a full-fledged and preferred form of job-oriented training. These two trends are complemented by the use of the principles of agile learning, micro-learning and a new configuration of educational spaces which are to increase the flexibility, speed and efficiency of learning in working environment.

Macro-level factors influencing LENV for ALE

The formation of high-quality LENV at the institutional level is characterized by the fact that it relies on the important role of the state as an actor that is able to regulate this environment and create suitable conditions for the development of lifelong learning. States that are intensively building their systems and policies for ALE are not only able to achieve higher levels of adult participation in NFE, but also have lower levels of inequalities in such participation.

In terms of a successful practice of improving institutional conditions, we have identified two main approaches. The first is the more general model of building a culture of lifelong learning carried out by UNESCO (2020). This approach focuses on a holistic and social understanding of the phenomenon of lifelong learning, for which it wants to create preconditions for higher levels of relevance and willingness to participate in ALE at various levels of society (e.g. in the legislative system, education organization, and value orientation of citizens).

The second is the state-centric model, which has so far gained ground in the scholarly discourse of ALE (Boeren, 2016; Desjardins, 2017, 2020; Rubenson, & Desjardins, 2009) and which focuses much more on state-implemented measures to support supply and demand for ALE.

In addition to these two approaches and the measures they propose, we point out two stimulating trends in the development of LENV for adults at the macro level. On the one hand, it is the creation of a state system of recognition of qualifications which leads to the interconnection of various forms of ALE (the formal one, NFE and INFOL), and thus to a higher degree of coordination and integration of the LENV environment. On the other hand, it is various innovations in monitoring and measuring participation in ALE, where it falls index of fairness.

At a slightly lower level of generalisation, we give examples of good practice that can contribute to creating opportunities for ALE, where it is not directly linked to the labour market or active employment policy. These are tools to support non-job-oriented education and to build support capacities for

vulnerable social groups. If the institutional environment of ALE is to have a high degree of inclusiveness, it must also focus on these two domains which are outside of the interests and logic of the labour market and economy.

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INTRODUCTION & CONTEXT OF ETF PARTNER COUNTRIES

Introduction

The aim of this report is to present an overview and a synthesis of the latest literature about innovation in learning environments in adult learning and education (ALE), notably about continuous vocational education and training (CEVT), and to identify examples of "good practice" as proved by projects, case studies and evaluation reports. This comprehensive knowledge will be used as a basic conceptual framework and repertoire of tools for boosting innovation in non-formal (NFE) and informal learning (INFOL) settings in European Training Foundation (ETF) partner countries (i.e. countries mainly from South-East and Eastern Europe, South and East Mediterranean and Central Asia). In this regard, the report presents:

1. a basic map of the research field focusing on innovation in learning environments for ALE, with particular reference to those dimensions that facilitate the connectivity between theory and practice;
2. a reconsidered conceptualisation of the innovative learning environment (emerging concepts and issues) in light of the contextual factors typical for ETF partner countries;
3. key factors influencing the access, quality and output of the learning environment in NFE and INFOL, especially those promoting equalisation of chances to participate in ALE.

ALE context of ETF partner countries

Implementing innovation in LENV in ETF partner countries is crucial because they usually have a lower level of overall participation in ALE and their institutional support of NFE and INFOL is weaker than in the states from Northwest or Continental Europe. Moreover, these countries also have a higher occurrence of educational barriers and overall educational inequality (see, e.g. Boeren, 2016; Hovdhaugen & Opheim, 2018; Dejsardins, 2017).

The main patterns and trends in participation and willingness to participate in ALE in selected ETF partner countries are described in Table 1 and 2. Table 1 summarises development of adults' participation, as reported by Eurostat in the last 15 years. Despite the continuous growth from 2004, most of the countries still have a lower participation rate than the EU average (12% in 2019). Only Estonia and Malta have a higher proportion of adults entering any kind of formal and non-formal education than the EU average. While Spain and Portugal are only slightly below the EU average, other states are much lower. Some of them indicate only one third of the EU participation level, and their actual participation rate is lower than 15 years ago (see, e.g. Romania, North-Macedonia, Bulgaria, Latvia or Lithuania).

TABLE 1. PARTICIPATION IN ALE IN SELECTED ETF TARGET COUNTRIES FOR WHICH DATA ARE AVAILABLE AND THE EU: 2004 TO 2019

GEO/TIME	2004	2005	2006	2007	2008	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Difference 2004-2019
EU – 28	10.9	N.A.	N.A.	10.0	10.2	10.0	9.7	9.8	11.6	11.7	11.6	11.6	11.6	11.8	12.0	+ 1.1
Spain	4.2	11.0	10.7	10.9	11.0	11.0	11.0	11.2	11.4	10.2	10.0	9.4	9.8	10.3	10.3	+6.1
Italy	7.2	5.7	6.1	6.1	6.5	6.2	5.4	6.6	6.1	8.8	7.6	9.1	8.5	8.7	8.7	+1.5
Portugal	4.3	3.4	3.4	3.8	4.8	5.0	11.2	10.5	9.6	9.7	9.9	10.0	9.9	10.4	10.7	+6.4
Cyprus	10.6	6.7	8.2	9.3	9.3	8.5	8.2	8.0	7.8	7.8	8.0	6.9	7.1	6.5	6.0	-4.6
Malta	6.1	6.6	7.2	7.7	7.8	7.2	8.0	9.0	9.6	9.3	8.7	8.9	12.4	12.7	13.6	+7.5
Greece	1.6	1.4	1.5	1.8	2.8	3.0	2.2	3.0	3.0	3.0	3.1	3.9	4.4	4.3	3.4	+1.8
Romania	1.6	1.3	1.2	1.2	1.4	1.0	1.3	1.0	1.7	1.3	1.2	1.0	0.9	0.8	1.2	-0.4
Croatia	2.0	1.7	3.2	2.7	2.2	2.2	2.2	2.4	2.6	2.4	2.5	2.6	1.8	2.4	3.4	+1.4
North	NA.	NA.	2.5	3.1	2.7	3.7	3.7	4.4	3.4	3.2	2.6	2.7	1.8	1.9	2.2	-0.3
Serbia	N.A.	N.A.	NA.	NA.	NA.	3.2	3.0	3.3	3.5	3.8	4.4	4.9	4.0	3.7	3.9	+0.7
Turkey	NA.	NA.	2.8	2.4	2.8	3.5	3.9	4.4	5.2	6.7	6.5	6.9	6.9	7.1	6.6	+3.8
Bulgaria	1.1	0,9	1.4	1.4	1.3	1.2	1.0	1.2	1.5	1.6	1.4	1.6	1.6	1.9	1.5	+0.4
Estonia	8.4	6.4	7.1	7.7	10.7	13.0	13.5	14.2	13.7	12.7	13.5	17.8	18.6	21.5	21.8	+13.4
Latvia	11.3	9.3	7.9	7.9	7.9	5.7	6.1	7.9	7.1	6.1	6.2	7.6	8.0	6.9	7.9	-3.4
Lithuania	7.5	6.9	5.6	5.9	5.5	4.9	7.0	6.3	6.9	6.1	6.8	6.7	6.5	7.2	7.9	-0.4

Notes: All data in percentage points Adults aged 25-64 are counted. North Macedonia and Turkey (the difference is counted between 2006 and 2019); for Serbia (the difference counted between 2010 and 2019). N. a. = data are not available. European Labour Survey. Available from: (Eurostat, 2020)

Table 2 shows participation level according to Adult Education Survey, which operates with the broader timeframe of participation (12 months versus a period of 1 month used by Labour Force Survey realized by Eurostat). Based on these data, we can see that selected ETF target countries are not a homogenous group of states with common structural conditions. Especially states from the Southeast Mediterranean (e.g. Cyprus, Greece, Croatia, Turkey) have a much lower level of participation in NFE than the EU. In contrast, states from Eastern Europe have a higher level of adult involvement in continuous education and training in comparison with countries from Southeast Mediterranean. However, many of their nonparticipants declare that they do not need further education (see Table 2).

It is highly probable that events connected with the global pandemic situation caused by COVID-19 will lead to higher pressure in this field for years to come (Boeren et al., 2020; Rambla & Milana, 2020; Waller et al., 2020). As a result, the impact will likely exacerbate previously mentioned patterns of participation and barriers. Therefore the focus on boosting availability of learning opportunities, developing flexibility of learning schemes and support of ALE is more critical than ever.

TABLE 2. PARTICIPATION AND WILLINGNESS TO PARTICIPATE IN ALE IN SELECTED ETF TARGET COUNTRIES FOR WHICH DATA ARE AVAILABLE AND THE EU: 2007 TO 2016

	Percentage of adults participating in NFE	Percentage of adults participating in NFE	Percentage of nonparticipants who declare that they do not need further education	Percentage of adults participating in NFE	Percentage of nonparticipants who declare that they do not need further education	Change in adults participating in NFE	Change in participants who declare that they do not need further education
AREA/TIME	2007	2011	2011	2016	2016	Difference 2007-2016*	Difference 2011-2016*
EU – 28	31.6	36,8	40	42.1	59	+10.5	19.0
Spain	27.2	34.1	10.1	39.1	57.3	+11.9	+47.2
Italy	20.2	34.3	12.8	40.6	48.0	+20.4	+35.2
Portugal	22.5	39.6	5.6	44.4	34.1	+21.9	+28.5
Cyprus	39.5	40.9	32.5	47.2	28.9	+7.7	-3.6
Malta	31.3	34.2	n.a.	33.8	53.7	+2.5	n.a.
Greece	12.7	9.6	24.4	14	30.8	+1.3	6.4
Romania	4.7	6.9	25.7	5.6	62.0	+0.9	+36.3
Croatia	18.4	n.a.	n.a.	29.8	53.9	+11.4	n.a.
North Macedonia	n.a.	n.a.	n.a.	10.4	73.5	n.a.	n.a.
Albania	n.a.	n.a.	n.a.	8.2	43.4	n.a.	n.a.
Serbia	n.a.	13.6	59.6	18.2	53.0	n.a.	-6.6

Turkey	12.8	15.1	70.1	17.8	46.9	+5.0	-23.2
Bosnia and Herzegovina	n.a.	n.a.	n.a.	6.9	74.6	n.a.	n.a.
Bulgaria	35.2	24.4	80.9	22.5	88.6	-12.7	7.7
Estonia	40.2	48	n.a.	41.2	63.9	+1.0	n.a.
Latvia	30.7	30	64.7	45.7	44.4	+15.0	-20.3
Lithuania	30.9	25.9	54.1	26.5	82.4	-4.4	+28.3

Notes: All data in percentage points Adults aged 25-64 are counted. Participation in NFE in the last 12 months. All data in percentage points. N. a. = data not available. *Percentage points. Sources: Adult Education Survey, 2007, 2011 and 2016 (Eurostat, 2020).

KEY CONCEPTS & CONCEPTUAL CLARIFICATIONS

Learning environment

According to Istance and Kools (2013, p. 49), a learning environment (LENV) is an organisational form that embraces the learning arrangements catering for a group of learners in context and over time. It may be primarily located in a particular institution, but it is not necessary that it is school-based or connected with some other form of physical space. In the case of ALE, it could be a work environment, museum exhibition venue or various types of digital platforms (e.g. online forum, podcast channel). In such case, learning space is flexible and has more options for the learner (Wright, 2018). For these reasons, OECD (2013, p. 11) states that LENV is as an organic, holistic concept – an ecosystem that includes the activity and the outcomes of learning.

This organisational form (or ecosystem of learning) has a multidimensional and multifactorial meaning. It contains all relevant factors or elements (Clarke, 2005) that influence the ability and effectivity of learning (see, e.g. Akkerman, Bronkhorst & Zitter, 2011; Engeström, 2007). These factors also stimulate metacognitive, reflexive processes of adults which are crucial for long term effect of learning activities (Bandura, 1986) and which are highlighted as core competencies for the 21st Century by OECD (OECD, 2020).

Due to this set of characteristics, according to Wright (2018) the concept of LENV is based on the different paradigm than traditional approach towards school education in the 20th century. It focus more on cooperation between learners, underlines the role of educators as facilitators of learning process and asynchronous forms of learning organization as well as educational resources that go beyond educational courses. This different paradigm accent individuality of learners and uniqueness of their abilities and life-trajectory as well as social background, i.e. aspects that are crucial in accessing and succeeding of ALE activities (Cross, 1981). This approach fosters learner-oriented (student-centred) education (Dumont, Istance, & Benavides, 2012, OECD, 2006, 2011a, 2011b, 2013) and the role of tacit/implicit learning elements as useful facilitators and accelerators of ALE (Tynjälä, 2008).

The wave of research and theorising connected with LENV highlights the significance of socio-technological changes: e.g., digitalisation, deindustrialisation, individualisation, flexibilisation. These transformations challenge society to redefine the critical skills and abilities of its citizens in the last decade (Dumont, Istance, & Benavides, 2012, p. 8).

The innovativeness in the context of LENV is usually understood as the simultaneous incorporation of principles that make learning more accessible, useful, meaningful and enjoyable: (1) centrality of learning and engagement; (2) collaborative approach towards learning; (3) focus on learner motivations and emotions; (4) sensitivity to individual differences; (5) individualisation of learning demands without excessive overload; (6) assessments consistent with learning aims and a strong emphasis on formative feedback; (7) horizontal connectedness across activities and subjects, in and out of a place of learning (OECD, 2013).

Adult learning and education: Non-formal education & informal learning

ALE is often classified into formal, non-formal education (NFE) and informal learning (INFOL). This classification was initially developed by UNESCO but is nowadays widely used in the whole field of ALE (Boeren, 2016; Rees, 2013; Regmi, 2015). For the purpose of this report, we focus mainly on two latter forms which are defined as follows (Cedefop, 2008; EU, 2012; Eurostat, 2007; Desjardins, 2017):

1. Non-formal education (NFE): comprises learning activities that take place outside the formal educational system. It involves structured activities that usually do not result in official certification, according to ISCED. This type of learning includes all activities conducted within the scope of a teaching-learning relationship, such as courses, seminars, conferences, distance learning and private lessons, pre-planned training and learning at the workplace. NFE also contains both job-oriented (vocational) as well as non-job oriented education and training activities.
2. Informal learning (INFOL): results from daily activities related to work, family or leisure. It is not organised or structured in terms of objectives, time or learning support. In most cases, it is unintentional from the learner's perspective and includes learning outside teaching-learning settings (the use of teaching materials, observation of other persons, learning or quality circles) as well as learning activities with a coach or an expert that are not planned in advance such as spontaneous instructions provided by colleagues in the case of urgent problems at the workplace. INFOL can occur almost anywhere, e.g. in the family, with friends or at the workplace. INFOL learning outcomes do not usually lead to certification but may be validated and certified in the framework of recognition of prior learning schemes.

From an analytical standpoint, we also distinguish two main subdomains within ALE: job-oriented and non-job-oriented types of ALE. This conceptualisation is crucial because nearly 75% of contemporary ALE is related to the workplace and is currently positioned as a way to serve economic needs (Boeren et al., 2020; Rubenson, 2018). Based on this conceptualisation, we offer an underlying analytical scheme distinguishing various forms of ALE (see Table 3; for a similar systematic approach, see. e.g. Desjardins, 2017; Lee, 2017; Boeren & Holford, 2016).

TABLE TITLE TABLE 3: DOMAINS OF ALE

	Non-formal education (NFE)	Informal Learning (INFOL)
Job-oriented learning	Job-oriented NFE	Job-oriented INFOL
Non-job-oriented learning	Non-job-oriented NFE	Non-job-oriented INFOL

RESEARCH AIMS & ANALYTICAL FRAMEWORK

Research aims

The main aim of this report leads us to three subsequent research goals focusing on both innovation in LENV for ALE and examples of good practice:

- RG1: To analyse innovations and good practices in a LENV on the demand side of NFE and INFOL (micro-level factors influencing the quality and accessibility of learning environment).
- RG2: To analyse innovations and good practices in a LENV on the supply side of NFE and INFOL (Meso-level factors)
- RG3: To analyse innovations and good practices in a LENV on the level of institutional support of NFE and INFOL (macro-level factors).

In this regard, we formulate several research questions which follows these aims. The questions specify the aims into the context of different forms of NFE and INFOL (job-oriented and non-job oriented, as described in Table 2). Due to this strategy, we can map all levels of education reality (see, e.g. Boeren, 2016, 2017) and relevant forms of ALE (Rubenson, 2018).

Micro-level factors

RQ₁: To what extent and how are adult learners' motivations, perceptions and needs identified to inform the design of learning environments for adults?

- RQ 1.1: To what extent and how are adult learners' motivations, perceptions and needs identified to inform the design of learning environments for adults in job-oriented and non-job-oriented NFE and INFOL? What are the primary types of innovation accenting this topic?
- RQ 1.2: What are examples of a good practice in the field of identification of learners' motivations, perceptions and needs with the purpose of improving the learning environment in job-oriented and non-job NFE and INFOL?

Meso-level factors

- RQ2: What are the characteristics of engaging learning environments that stimulate quality participation of adults in non-formal and informal learning?

- RQ 2.1: What are the characteristics of engaging learning environments that stimulate quality participation of adults in job-oriented NFE and INFOL, and what are the examples of a good practice in this area?
- RQ 2.2: What are the characteristics of engaging learning environments that stimulate quality participation of adults in non-job-oriented NFE and INFOL, and what are the examples of a good practice in this area?

Macro-level factors

RQ3: What should happen at the institutional level to create engaging learning environments for adults?

- RQ 3.1: How far are learning environments considered at an institutional level, and what are the elements that must be addressed at this level?
- RQ 3.2: In learning environments for adults, what are the differences between the formal settings, and the NFE and INFOL settings? What are the advantages of connecting these settings? Or are there any advantages in them remaining distinct and separate?
- RQ 3.3: Who are the various key players in the NFE and ILE learning environments? Furthermore, to what extent are they recognised in the education and training system, and visible in the society?
- RQ 3.4: What is the interest of employers, employees and other organisations that play a role in social partnership in ensuring adequate environments for adult learning?
- RQ 3.5: Which inspiring examples reflect the findings to the above questions?

METHODS

Analytical procedure

The review report is based on a combination of analytical "deductively oriented" and "inductively oriented" literature review. While the analytical focus is built on previous research questions (RQ1.1 to RQ3.5), which helps us navigate a selected body of literature with higher accuracy (see screening process below in Figure 1), the inductive part is oriented towards new, unpredicted or surprising phenomena connected with LENV (emerging issues and new concepts) which can boost its inclusiveness and effectiveness for adult learners.

Criteria for study inclusion and exclusion

The paper examines research published in scientific journals and conference proceedings. We limit our analysis to studies published in English and we do not include any foreign papers written in other language than English, which is due to the growing number of reports published in English as well as for practical purposes. The following a priori criteria were required to be considered for the final data set:

- studies have to focus on the innovation of learning environment/space;
- studies have to focus on adult population (18+) or lifelong learning;
- studies should bring a recommendation for developing or learning environment, its innovation;
- studies should focus on inclusiveness and quality of participation in ALE;

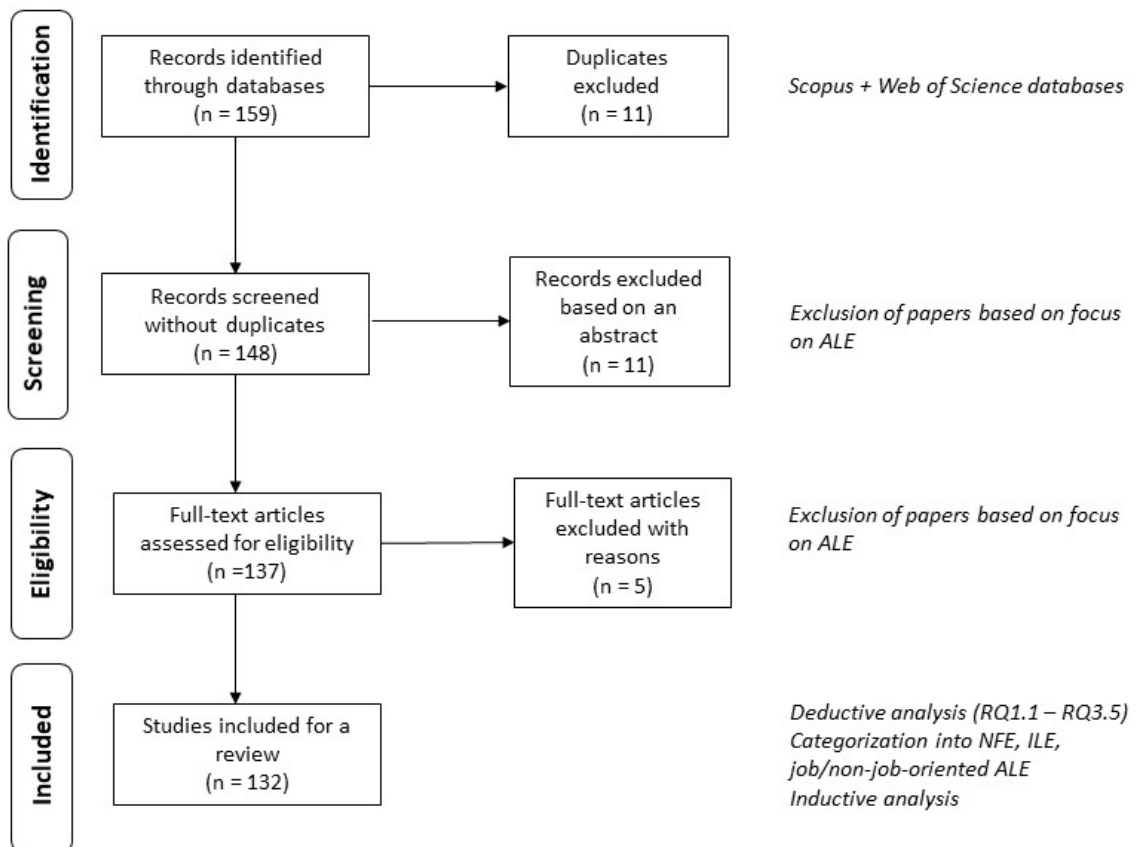
- studies are relatively new, mainly published within the past ten years (2010–2020).

Data

Based on these criteria, we set the keywords for the selection process. For obtaining the data a search procedure with the databases of: Scopus (Elsevier) and Web of Science (Clarivate Analytics) ranging 2010 to 2020 was used. The chosen search terms were: "innovative" AND "learning environment*" OR "learning space" AND "adult learning*" OR "adult education*" OR "vocational education and training*" OR "lifelong learning*". Based on this approach, the total number of potentially relevant published and unpublished papers was calculated. Further on, a screening analysis on titles and abstracts of the studies was carried out, which was followed by full-text screening. The papers with studies that contain a LENV, not primarily focusing on ALE were excluded. The model of the whole screening process is described in Figure 1.

Additionally, we also utilise extra literature (books, book chapters, reports articles etc.) that was recommended by consulting expert groups or that was necessary when previously selected literature did not offer answers for the raised research questions.

FIGURE 1: FLOWCHART OF THE SEARCH AND SCREENING PROCESS



The searching process yielded a total of 159 studies from both databases. The articles were first screened according to their content (the titles and abstracts), resulting in a total of 148 unique studies that could potentially be relevant for understanding off innovative practice in LENV for adults. In the next

step, the articles were assessed for their eligibility and were screened again, according to the criteria for inclusion. Finally, we collected 132 studies that are a part of the first review (the list of the studies is part of the references list below).

A detailed analysis of both searches (without duplicates) in Scopus and the Web of Science database is a part of the supplement material (see Supplement 01 below). In this case, the additional analysis included the results of a search based on publication years, subject areas, countries/regions (as a tool for identification of studies highly relevant for ETF partner countries), and the sum as well as the development of citations per year (for the evaluation of their scientific impact).

GENERAL TRENDS IN THE LITERATURE ABOUT LENV FOR ALE

Based on the review analysis, we can summarise the key features of the literature about LENV for ALE into the following points:

1. The primary orientation of the research: The majority of studies about LENV for adults focus mainly on higher education institutions and their courses, i.e. on adults that have been studying in the distance/online forms of study programmes. For this reason, the area of formal education and CVT through tertiary education contains a high proportion of the analysed papers. The topics of NFE and INFOL are less investigated.
2. The subject of the research: The previous point leads to a higher representation of younger adults (18 to 24/30 years) in the research results than older adults (25 to 64 years). This orientation also implies the prevalence of learners with a higher level of attained education (ISCED 5 and higher) in the whole discourse. In most cases, the research subjects are already educated.
3. Research methodology: Case studies dominate the sample of literature (approx. 50% of all the studies), followed by theoretical papers and review articles (25%). Surveys, qualitative, experimental and mix method/design research articles comprise a minor part of the analysed literature (approx. 20 to 25%).
4. Content of the research: Many studies are based on a declarative assertion about innovation and usefulness of different characteristics of LENV for ALE, but they offer only partial empirical evidence for such a statement. In the selected literature, many studies do not have a high scientific ambition. They represent what Ellen Boeren (2018) calls "methodological underdog". This metaphor means that the studies do not address systematic testing of a particular theory, exploring causal relationships between variables, or try to understand a deep meaning/transformational dimension of learning activities. Most of the papers are satisfied with a basic description of some intervention into LENV (e.g., incorporation of the new digital online learning tools, the specific organisation of learning activities (flipped classrooms), learners' groupings (smaller groups), or learning support and assessment (e.g. incorporation of mentors).
5. The core of innovation in LENV: How is innovativeness understood in this field? In the selected sample, a large part of scholars addresses innovativeness as an application of one new element into the existing LENV. The starting point, the "original LENV", is usually based on the traditional paradigm of school education (Wright, 2018) where NFE imitates school settings – classrooms-based education. Subsequently, the quality and impact of this environment are improved through

- the intentional application of a new learning component into it (e.g. asynchronous organisation of learning tasks and instructions or usage of free online materials).
6. The critical type of innovation in LENV for ALE: A high proportion of the articles focus on digital online learning (DOL). In this context, the utilisation of DOL is frequently considered as the primary type of innovation. This trend is more reliable in older literature (2010 to 2015) than newer (after 2016). The prevalence of the DOL articles has two probable causes. First, LENV innovation is technology-oriented or technology-driven. The innovation of LENV has been mainly based on the application of new digital platforms that allow to extend LENV and make it more flexible and less dependent on fixed time/space classroom schedule. It is based on decoupling the learning environment and the site of learning. Second, the basic research in this area is relatively new and less developed in comparison with other research fields of ALE (e.g. transformative learning, informal learning in workplace settings, civic education, an issue of participation in ALE; for a thorough discussion see Fejes & Nylander, 2015, 2019). The state of the art leads to a situation in which we do not have enough cumulated knowledge about other areas of LENV for adults.
 7. Epistemology: A predominate part of the research has been built around the technology-oriented paradigm. Secondary, it stresses practical/action-based research with attention to the application of new tools/elements into learning activities rather than rigorously testing the evidence for the impact of these tools/elements (see Dumont et al., 2013). This feature is more typical for the articles included in the Web of Science database (mostly in proceedings from different conferences related to technology in ALE between 2010 and 2018) than research articles from the Scopus database. These are more diverse than papers from the previous database.
 8. Theoretical orientation: Primarily, it is based on the constructivist theory of learning with a strong focus on individual learners. Thanks to that, the learner-oriented approach is omnipresent in selected literature. This orientation also implies the frequent occurrence of self-regulation of learning and self-direction of learning concepts in many papers. Both can be considered as a leading secondary topic in many articles. Other frequently used theoretical concepts are: "collaborative learning" (Harasim, 2017), "community of inquiry" (Garrison, 2017) or "activity theory" of learning (Engeström, 1987, 2007).
 9. Evidence in the reported results: Rather than inconsistency, the articles suffer from the lack of evidence about impact/effectiveness of LENVs and thus also for systematic implementation of new LENV features into ALE across different: (a) groups of adults (e.g. according to their age, gender, attained education, and working status), or (b) contexts of ALE (e.g. according to division into job/non-job oriented ALE). These factors are not well documented (see also the point above addressing "the subject of the research"). The lack of knowledge about these factors leads to a situation in which we cannot adequately design LENV from the "office table" according to the recent findings of socio-demographical characteristics of adults and the primary purpose of education and training.
 10. Research blind spots: What are the crucial blind spots? Does the research contain any flaws based on the design, data collection, instruments or interpretation?
 - a) Firstly, there is an evident overrepresentation of younger adults with a higher level of cultural capital which goes hand in hand with an underrepresentation of older adults with only primary education or low-literacy and DOL skills. Future research in this area should put more emphasis on studying innovations in LENV for them. Only a few studies (e.g. Guo, 2017; Liguori & Tieri, 2014) address the situation of a vulnerable group of adults in this context.
 - b) Secondly, the predominant part of the research articles use inadequately small samples. Only a few studies have been done on a representative sample of the adult population. This feature

leads to an issue with the generalisation of research findings. The low level of generalisation restricts our capacity to formulate recommendations with a universal impact. For this reason, all the possible recommendations should take into consideration the issue of generalisation and always highlight the specific local context of learning activity and LENV.

- c) Thirdly, the problem of diffusion of LENV innovation from one context to another is obvious. The problem has two forms. Partially, it is the transmission from formal education institutions to everyday non-formal and informal learning settings, and partially, from one sociocultural environment (e.g. country, skill-formation regime) to another. The problem of transmission has a significant impact on the application of different tools in the ETF partner states. Most of them have institutional features different from other European or Anglo-Saxon countries (see, e.g. Boeren, & Holford, 2016; Desjardins, 2017; Regmi, 2015; Rees, 2013) which are the most frequently studied adult education systems in our sample (represented approx. 66% of the research articles).
- d) Fourthly, the blind spot seems to be the ideological blindness based on the technology-driven paradigm. This approach represents the belief that innovations have to draw from the most recent technologies. Such an understanding is evident in a booth, OECD documents (OECD, 2013, 2018; Istance, 2010; Istance & Kools, 2013) that have highlighted the factors such as exploiting science, knowledge, research and development and the usage of technological advances as the main steps in LENV innovation and research about LENV from technology-oriented disciplines (e.g. informatics, engineering). However, the utilisation of DOL in ALE has many limitations and faces many challenges (see below in detail).

Socialization. Although the issue of socialization is considered by many ALE theorists (Illeris, 2003, 2009; Jarvis, 2006) to be an integral concept for understanding the way the individual adults learn throughout their lives (how they acquire norms, patterns of behaviour and social roles within a certain group/organization), it is given little space in the research of LENV.

Most of the analysed papers focus directly on the influence of a particular aspect of LENV on the cognitive or meta-cognitive processes of learners, on their learning experience, or on the acquisition of certain skills, and not on the formation of value attitudes and tacit understanding of norms and adopting social roles.

If socialization is studied in a given discourse, then it is always considered a kind of a broader "background", a more general, indisputable characteristic of the environment which implicitly affects the individual. However, its influence in this case is latent and the process of socialization is seldom directly related to ALE. Socialization is then most often reduced to:

- a) the formation of social capital – i.e. the expanding of the network of social contacts that an individual disposes of and which are a by-product of social learning when entering a new environment;
- b) a status with which some individuals enter the learning process and which creates a barrier to the process of further education in the form of shyness, underestimation, and fears that were formed in the early stages of socialization.

MICRO-LEVEL FACTORS INFLUENCING LENV FOR ALE

In this chapter, we switch our focus to a series of questions linked with RQ1, respectively RQ1.1 and RQ1.2. We focus to variations between job-oriented and non-job-oriented ALE (to what extent and how adult learners' motivations, perceptions, learning characteristics and needs are identified to inform the design of learning environments for adults?).

Identification of adult learners needs for developing optimal LENV

How to optimise and design LENV according to adult learners' characteristics and needs? According to the contemporary literature (see e.g. Kearns, 2015; Lancaster, 2020; OECD, 2019a, 2019b), the optimisation can be successfully achieved only through an analysis of learners' needs and screening of adult skills, attitudes and motivation. These procedures play a crucial role and make up starting point for constructing a high quality LENV – designing both the course aim and the organisation of NFE and building tools for more available, accessible and efficient INFOL. These preparation activities are always a part of the successful pre-learning phase.

Under optimal conditions, the initial screening process should lead to the personalisation of LENV (see below in more details). In this context, learners' self-assessments have to be taken into account when making decisions on a personalised guiding and developing of stimulating LENV.

Screening of learning needs is a crucial practice necessary to establish effective LENV in the workplace. It is one of the pillars of a successful job-oriented NFE. The identification helps us understand what knowledge, skills, and attitudes are relevant for the organisation, and what workers need to meet expectations about their job (see e.g., Kearns, 2015; OECD, 2019a, 2019b). According to Lancaster (2020, p. 45), the analysis should focus on diagnosis of "what is essential, not what is desirable," and on supporting competence "just in time" not "just in case". In parallel with that, the screening of learning needs should be oriented to both an individual's and organization's development needs.

Despite the existence of several approaches and an established practice (see, e.g. Bee & Bee, 2003; Bowman & Wilson, 2008) within this type of analysis, Lancaster (2020) formulates several principles that innovate the process of learning needs identification and application in the job-related organisational context:

1. Take into account the learning capabilities of employees (their knowledge and skills).
2. Incorporate active involvement of employee-learners into the analysis.
3. Use multi-source data for a learning gap analysis so that it does not purely rely on the subjective evaluation of employees or managers.
4. Broaden the scope of the analysis. Understand that the analysis should always support working performance, and it is also one of the most efficient tools for the exploration of the relationships in an organisation.
5. Include comprehensive performance-related insight, not just focus solely on the content of the learning programmes/courses and their organisational form (e.g. online training, workshops).
6. It is not a one-off activity. Learning needs analysis should be an ongoing process supporting the consequent improvement of an organisation and its LENV.

7. The vulnerability of employees should be reduced as much as possible. One of the ways how to do it is through the usage of "the third party" for conducting the analysis and ensuring anonymity of employee.
8. Learning gaps should be formulated based on the skills and behaviours of high performers.

Contrary to the workplace learning, other types of NFE usually do not work with a direct learning needs analysis. Non-job-related types of education often take place within community settings, e.g. in libraries, counselling centres, or museums. These sites of learning are based around education programmes which promote civic engagement, cultural knowledge or which assist learners in taking control over their lives (Merriam & Baugartner, 2020). If the learning needs are diagnosed, they are usually identified through an interaction with community members or via unstructured interviews, but they usually do not represent an in-depth analysis. Due to that, the utilisation of the learning needs analysis in the field of non-job-learning could be highly beneficial for designing and innovating LENV in the non-governmental and civic sectors.

According to our analysis, we can identify the following characteristics in order to design optimal LENV for ALE:

1. identification of learners' expectancy about LENV;
2. identification of previous experiences with learning – educational biography;
3. identification of attitudes towards LENV;
4. identification level of self-direction and self-regulation of learning skills;
5. identification of DOL self-efficacy and digital skills;
6. identification of learning styles;
7. identification of core self-evaluation of adults.

Identification of learners' expectancy about LENV

Kjell Rubenson (1977) stated almost 50 years ago that learning always follows expectations what can bring and change. This claim has been confirmed many times over (e.g. Illeris, 2009; Kyndt et al. 2009, 2011, 2012, 2013) and nowadays is considered as a backbone of the expectancy theory of adult learning (Boeren et al. 2012a, 2012b).

Following this assumption, OECD (2013) emphasises that high-quality LENV in NFE should be based on the clarity of expectations and should deploy assessment strategies consistent with these expectations. Several authors (e.g. Illeris et al., 2015; Roshdi et al., 2017; see also Rubenson, 1977, Cross, 1981) state in this regard that if the learner's expectations are high, and actual perception of LENV is low, it leads to lower enjoyment, retention and negative emotions. Their occurrence can have effect on planned learning, and it could lead to lower engagement and outcome of learning activities.

One of the available screening tool for monitoring learners' expectation is offered by Roshdi et al. (2017) in their study about building a positive learning environment for adults published in the International Journal of Learning and Teaching.

Identification of previous experiences with learning – educational biography

Another essential factor, influencing preparedness and motivation of adults to continue in their learning activity throughout their life-span is their previous learning experience. According to Peter Altheit: "anyone who never had the chance to learn how to learn will not make any effort to acquire new skills late in the life course" (2018, p. 159). Such a person would be less willing to actively and reflexively learn from their everyday experience, and would likely lack intentions to join NFE learning activities and training.

The recent literature about ALE (Boeren, 2016, 2017; Hovdhaugen & Opheim, 2018; Lee, 2017) highly stress previous participation and positive experience with education as a critical precondition for participation in lifelong learning. Chances that adults will be willing to enter NFE courses, participate in job-related training, or actively learn from various educational resources from their everyday life will grow with their previous positive educational experience in ALE.

This experience also directly influences ways how they learn – how they can cope with learning tasks, how they perceive the process of learning, and it has an impact on the expectations and preference of learning styles. For example, according to Gerhard Messmann and his colleagues (Messmann et al., 2018), low-skill adults prefer more learning form their everyday experience embedded in work (e.g. talking about problems with colleagues, exchanging information with colleagues, learning by doing etc.).

Former participation leads towards more realistic expectations about LENV and effects on learning (see argumentation above). Moreover, previous educational biography is also essential for the development of learning reflexivity because it is closely related to individual self-regulated learning and self-directed learning skills and an ability to manage and avoid excessive cognitive, temporal and emotional overload. It is because adults with a higher level of education have a higher level of these skills, and they are able to cope better with learning demands.

Identification of attitudes towards LENV

We can find significant differences in attitudes towards lifelong learning among adults (Cross, 1981). Positive attitudes are frequently associated with previous educational experiences (see above). The more positive these experiences, the more positive the attitudes towards ALE (Rubenson, 2018). Based on this argumentation, the adults with higher education level have significantly higher positive attitudes towards their participation in ALE (Boeren, 2017; Desjardins, 2017).

In this context, Viberg and Grölud (2013) disclose in their study that attitudes of learners towards LENV, particularly towards DOL, are essential for understanding of their overall motivation and self-regulation learning/self-directed learning skills. Positive attitudes accompany higher levels of both motivation and self-regulation/directions. Moreover, differences in them are primarily based on socio-biographical factors (i.e., age, gender, education and level of skills used in work) rather than on national/sociocultural differences (see Viberg & Grölud, 2013; see also Rosell-Aguilar et al., 2013). Due to globalization, everyday experience with ICT environment is more common than ever, and it has nothing to do with value orientations or other cultural patterns. It has become part of the shared global culture. More important in this regard, it is an age of the learner, which influences the commonality of digital devices usages.

Blunt and Yang (2002) validate research tools for measuring adult attitudes towards adult and continuing education. Their questionnaire classifies adults into actors who enjoy learning, who see the high importance of education and for whom ALE has intrinsic value.

Identification level of self-regulation of learning and self-directed learning

In one of the most recent Amazons' bestsellers about learning, decision-making and cognition, we can find the following statement: "The best teacher is self-reflection" (Parrish & Beaubien, 2020). The authors of this book point out what has been systematically confirmed by research in the field of self-regulation of learning for the last 30 years. The ability of actively and independently reflecting the learning process is highly effective for knowledge and skills acquisition.

Following this, self-regulated learning and self-directed learning skills contain a fundamental individual precondition for ALE (e.g. Alias, 2012; Botha et al., 2016; Hwang & Fu, 2020; Sze-yeng et al., 2010). Without them, or at least without the existence of their basic level, the development of ALE is very difficult endeavour (see e.g. Bandura, 1986; Knowles, 1975). The more independent learning process is, and less structured LENV is, the higher requirements for these skills are.

Alias (2012) mentions in this context that most adults are used to studying in a structured way, and this a reason why they are usually not well prepared for an independent self-regulated learning and self-directed learning and for structuring their own learning activity. With this in mind, a big part of adults can struggle with learning, especially in DOL settings that have a higher requirement for self-regulated learning and self-directed learning skills.

Also, in workplace conditions, it is not easy to develop a high level of self-directed/self-regulated of learning. Both require the dedication and motivation of employees to ALE (see Bandura, 1986; Diethert et al., 2015). In other words, self-directed/self-regulated of learning is not an automatic state, especially in ordinary working conditions, without adequate support by the management and human resources department/staff, and without evaluation of their assistance. Initial support or declarative claims about the importance of ALE are not sufficient for enhancing self-direction/self-regulation of learning (Diethert et al., 2015; Manzuoli et al., 2016). They have to be accompanied by the support of learners and by the design of LENV that enables preparation of employees for the learning process and optimisation of their learning load according to job and non-job duties.

As a consequence, the development and diagnosis of self-directed/self-regulated learning (as well as other meta-cognitive skills, e.g. self-efficacy or self-determination) are crucial for the optimisation of LENV for ALE (see also Bandura, 1986; Knowles, 1975).

Several widely used screening tools exist for this aim: (1) Self-direction scale (see Botha et al., 2016); (2) the most used MSLQ – motivated strategies for learning questionnaire (Pintrich et al., 1993); (3) A-SRL – academic self-regulation scale (Magno, 2011); (4) OMQ – on-line motivation questionnaire (Boekaerts, 1993, 1999); (5) SDLS – self-directed learning skills questionnaire (Ayyildiz & Tarhan, 2015).

Identification of motivation towards ALE

Identification of motivation goes hand in hand with the identification of self-regulated learning and self-directed learning skills. In most cases, it represents their "engine." In this regard, most theories of self-regulated of learning (see, e.g. Boekaerts, 2011; Zimmerman, & Schunk, 2011; Winne, 1996) consider motivation as one of the main components of the self-regulated learning processes/models.

In line with many scholars (see, e.g. Boshier & Collins, 1985; Boshier et al., 2006; Illeris et al., 2015; Chen et al. 2016), we can emphasise that significant differences exist in motivation among adult learners according to their socio-biographical characteristics. For example, Chen et al. (2016) have identified that younger elderly (50 to 60 years) pursue ALE more frequently for updating their knowledge and skills, for fitting in with the job-related needs, and they do so according to their retirement status and age. Regarding gender, men participate much more from job-related reasons, while women from non-job-related motivation (Boeren 2011). Their findings cast light on variation in motivation among older adults who are sometimes described as one homogeneous group of learners (Desjardins et al., 2006).

The motivation aspect of learning is frequently research topic. Many available tools exist for its identification (see, e.g. Blunt & Yang, 2002; Chen et al., 2016; Mulenga & Liang, 2008). Among the most relevant see the questionnaire developed and validated by Richard Boshier and his colleagues – EPS/Education Participation Scale (see e.g. Boshier & Collins, 1985; Boshier et al., 2006). This scale enables to distinguish between goal-oriented, activity-oriented and content-oriented learners. For example, it was used by Issac et al. (2001) to discover the motivation orientation of African American learners in church-based education or adult learners in Shanghai (Boshier et al., 2006).

Identification of DOL self-efficacy and digital skills

With higher requirements for the usage of new technologies, a growth in demands for DOL skills of adults can be observed (Merriam & Baumgartner, 2020). Inevitably, screening of DOL ability plays a progressively critical role. In this case, it is mainly a blended learning environment application of which is a primary type of organisational innovation in LENV described by contemporary literature.

For example, Chen et al. (2010a, 2010b; see also Mavroudi et al., 2018) argue based on their research that without DOL skills and self-efficacy, learners rely more on their close support network (often family members), and they are not so independent, as it is optimal for their further development and learning and for establishing the capability of the self-directed learner. When DOL self-efficacy is low, it is necessary to build an appropriate peer support for higher engagement, persistence and satisfaction of the learners.

The importance of technological competence is also connected with motivation to use DOL in workplace settings, and it leads to perceived quality of learning in DOL (Kim & Frick, 2011). This aspect has to be considered in designing LENV for adults who have a low level of DOL self-efficacy and digital skills.

Identification of learning styles

Identification of learning styles is another essential element that can be used for optimisation and enhancement of LENV for ALE. In this context, Cela et al. (2015) have used an inventory of learning styles from Felder and Silverman (1988) research for exploration preference of learners in 8-week online course. This inventory can quickly identify the prevalence of preferred types of learning in e-learning environment. According to this approach, it is possible to personalise learning activities by tailoring them to the learning styles of the participants. Also, Mavroudi et al. (2018) describe the process of identification of learners preferences, related to methods, types of tasks and activities, which adults find the most favourable. Both of these screening tools could be useful in order to establish a personalised learning environment (tailored to the learner's preferences), especially when

the learning group is smaller and/or results of learning depend more on individual cognitive learning styles of adults.

Many other scales focusing on the learning styles in ALE are more or less interrelated with the topic of self-directed learning (see also our discussion above). In this case, Stockdale and Brockett (2011) validated a tool for measuring learning styles and different aspects of SDL. One of the newest scales has been introduced by Lee (2014a, 2014b). His "student engagement questionnaire" is focused on a battery of questions about self-management of learning, adaptability, problem-solving, communication and interpersonal skills as well as the ability to function in collaborative learning and several other components that form a unique learning style of the individual learner.

Identification of core self-evaluation of adults

Personality features have been one of the less investigated aspects of learners that could be used for the preparation of LENV design. Regardless, Diep et al. (2017) have shown that core self-evaluation can significantly predict adult learning performance. According to them, it is fundamentally related to interaction during collaborative learning activities and influences individual capacity establishing social connectedness through learning. More collaborative learning is, the more critical is the personality of the learner.

GOOD PRACTICE EXAMPLE

The Future Skills for Volunteering (FutVol, 2020) project, realised in ten countries across Europe, can be considered as an example of good practice in both, experiential learning and learning needs analysis. Its core is based on two fundamental principles. First, it is sharing experiences and observations by volunteers among each other in order to develop their future skills in the field undergoing growing professionalisation. Second, these experiences are used for understanding their learning needs to meet future challenges and to provide the concept of a skill that is useful for learners and easy to adapt to many contexts.

The project shows how can be used learning needs analysis for broader purposes and in other contexts than is job-related company education. Based on the share experience and experts insights, it brings recommendations not just for volunteers itself, but also for third-sector actor how they can help volunteers gain the right skills and manage change in their environment. Also, various other stakeholders such as decision-makers can use the result of this learning needs analysis to build on their awareness on issues affecting the voluntary sector, which will help them in developing infrastructure for volunteering in general (FutVol, 2020).

Enhancing motivation of adult learners

The discourse studying LENV for ALE shows high consensus about the necessity to strengthen the motivation of adults to learn. Scholars (e.g. Boekaerts, 1993, 1999; Boshier & Collins, 1985; Chen et al., 2016; Illeris, et al., 2015; Kim & Frick, 2011) agree that motivation has to be systematically

enhanced during the whole process of learning, and a big part of the learning support should be devoted to maintaining the motivation.

For example, according to Alias (2012), fostering motivation of learners in NFE and INFOL settings is a central challenge not just for establishing quality LENV but also for maintaining it. In order to do that, motivation should be regularly enhanced. If not, it is the primary outflow of learner attention in LENV, mainly if it based on DOL (Kim & Frick, 2011).

Several authors formulate some critical principles of motivation adjustment:

1. adjustment according to the reason for participation in ALE: goal-oriented, socially-oriented or activity-oriented (Boshier 1977, 1991; Boshier et al., 2006);
2. adjustment according to the direction of motivation: intrinsic versus extrinsic (Deci & Ryan, 2013);
3. personalisation according to the motivation types: "growth/fixed mindset" (Dweck, 2008) and learners' "grit" (Duckworth, 2017);
4. adjustment according to the socio-biographical characteristics of learners;
5. adjustment according to the current skills and learning capabilities, i.e. matching individual ability with expectations. In this case, some authors emphasise that "motivation comes about when interest and capabilities align" (Stulberg & Magness, 2019);
6. adjustment according to the current motivation to learning: when motivation is high, learners should focus on doing difficult things, while when motivation is low, they should switch toward a focus on tiny, easy things (Parrish & Beaubien, 2020);
7. lowering the requirement for exercising self-control (Parrish & Beaubien, 2020). Learners who appear to have better than average motivation, typically operate in LENV which does not require them to use self-control.

MESO-LEVEL FACTORS INFLUENCING LENV FOR ALE

Meso-level features of LENV for ALE are primarily connected with the characteristics of optimal/stimulating LENV, which have organisational/institutional nature: e.g. content of learning, its time organisation, the involvement of educators, a pattern of cooperation, learning resources and many others (see, e.g. OECD, 2013; Istance, 2010; Istance & Kools, 2013).

At this level, a high quality LENV should function as an accelerator of learning and leads to its enhancement and long-term sustainability. In an ideal world, it results in the continuation and transformation of ones accidental learning into a lifelong practice.

In order to improve both the organisation design of NFE and the broader institutional environment for INFOL Akkerman and her colleagues states: "It becomes necessary to consider how the players and parameters of learning can be designed and redesigned, taking account of existing realities, contexts, learners, and of the perceived impact of the initial learning designs" (Akkerman et al., 2011). The authors' ideas help us understand that a high-quality LENV is not a stable entity but an ongoing project of building and rebuilding environment for new learners, with their unique biographies and skills, and according to their learning tasks.

The importance of meso-level features results from the fact that they directly influence the process of learning. In this case, the recent literature usually describes application or revision of the existing LENV in order to increase its positive impact on adults. According to some scholars (Chan & Wang, 2011; Roshdi et al., 2017), these characteristics are also possible to screen and evaluate. For this purpose, Chan and Wang have prepared "Clinical Learning Environment Inventory" (CLEI) which can be used for measuring some fundamental aspects of non-formal learning settings.

In the next section, we move to the RQ2 (What are the characteristics of engaging LENV that stimulate quality participation of adults in non-formal and informal learning?). As a response to this question, we offer a description of the crucial characteristics of LENV for adults frequently mentioned by recent academic literature. These aspects are considered as relevant factors influencing the quality of learning experience, its relevance and impact:

1. personalisation of LENV;
2. collaborative learning;
3. experiential learning;
4. DOL forms and tools;
5. instruction, learning support and assessment;
6. the new content of learning;
7. innovations in job-oriented NFE.
8. INFOL in work settings: Expansive learning environment and tools for its formation

Personalisation of LENV

What does personalisation of learning mean? It is an organisational practice built around the principle of the priority of learners, which recognises the learners as a centre of the learning process, encouraging their active engagement, and developing in them an understanding of their activity "as learners," enhancing their self-directed/self-regulated learning skills (OECD, 2013; Istance, 2010). According to Hwang and Fu (2020), personalisation is an adjustment of learning content and paths, cognitive guiding, developing high order abilities, facilitating diverse learning modes, and fostering autonomous learning and lifelong learning abilities (i.e. self-directed/self-regulated skills).

The process of personalisation can have several dimension and can contain individualisation according to:

1. the relevance of the content of learning for a particular learner or a group of adult learners, e.g. employed/unemployed, high-skill/low-skill employees (Illeris, 2004);
2. learning tasks based on the real-world experience of learners (Illeris, 2003, 2009);
3. age, e.g., According to Kahu et al. (2013), older adults are less likely to engage in active learning strategies (e.g. collaborative learning). If they use them, it is necessary to design LENV more towards collaborative learning tools and tasks, especially if someone wants to build this set of skills. On the other hand, older adults have a higher capacity to integrate their learning outputs with workplace experience (Kahu et al., 2013).
4. personalisation according to DOL skills and self-efficacy learners. Adults with a lower level of digital skills and self-efficacy have to need more additional support and instruction, than adults with higher digital proficiency.

As a consequence, personalisation allows educators to be more sensitive to the individual differences among the learners, including their prior knowledge.

However, not all scholars are proponents of personalisation. Contrary to this idea, Wesiak et al. (2014) claim that the concept might not be the most effective way how to approach lifelong learning in the long-term. According to them, it is not about optimisation of LENV in line with personal preferences, but rather about finding new ways to change learners' attitudes towards an open approach to LENV, which enable them to benefit from all available resources for their learning. In other words, the goal should be prepare them to be self-directed actors of their learning (Ayyildiz & Tarhan, 2015; Knowles, 1975; Magno, 2011).

This argument is even more important in INFOL settings where there is a higher emphasis and more demanding requirements for self-directed/self-regulated learning. In addition to this discussion, we should mention that this educational strategy always depends on the level of general (educational) skills of adults (Hanusek, 2016). Without a basic level of education and literacy (ISCED 3 and higher), it is complicated to build essential habits connected with self-directed/self-regulated learning.

Collaborative Learning

Another critical aspect of high-quality LENV is the utilisation of collaborative learning theory as the form of learning organisations, groupings and assessment. The collaborative approach is built around several fundamental principles: (1) enhancing positive mutual dependency, (2) promoting personal accountability, (3) developing interaction and social skills, and (4) improving group processing (Johnson & Johnson, 1999).

Through these activities, learners gain higher-level reasoning, frequently generate new ideas and solutions as well as have a higher transfer of what they learn within one situation to another (through transfer from a group to an individual learner). This type of learning is beneficial, especially when learning tasks need more problem solving, higher reasoning or critical thinking (Johnson & Johnson, 1999).

Although we have identified a strong trend to personalisation/individualisation of learning for adults when designing LENV, many papers (see, e.g. Biasutti et al., 2015; Cela et al., 2016; Harasim, 2017; Istance & Kools, 2013; Merriam & Baumgartner, 2020) have also highlighted another trend towards collaborative learning. They can go together, as the collaborative practice can be a part of a personalised LENV for some adults. In this regard, collaborative learning is frequently mentioned as a useful and innovative tool for obtaining newly emphasized social skills (e.g. interaction skills and social intelligence), problem-solving skills (e.g. solving complex tasks in a workplace) and increasing the effect and sustainability of learning (through higher social engagement and mutual dependency and accountability).

According to some scholars (see, e.g. Biasutti et al., 2015; Cela et al., 2016), it is also useful when one wants to support identity-building connected with learning tasks or to develop reflexivity and self-regulated learning/self-directed skills (as a secondary product of learning). The results of learning are then substantial for non-job-oriented learning in community settings and are not reduced only to performance indicators. Identity building and reflexivity are essential elements promoting a positive experience of learning and they contribute to its continuity. In this context, some scholars (Clear, 2018; Deci & Ryan, 2013) propose that most people tend to continue in some activity, e.g. learning, only if it fosters their self-perception. As a result, the positive reinforcement of their own identity subsequently leads to positive emotions connected with such an activity and fostering of particular human behaviour. The experience of psychological success in this context helps to motivate adults to invest their energy and effort in learning.

The collaborative organisation of learning is promoted through collective learning tasks that contain sharing, creation, dissemination and application of knowledge. It could be situated in both concrete physical space (classroom) and virtual space, or their combination (flipped classrooms). In the case of DOL, the most commonly used tools enhancing collaborative learning are chats, forums, blogs, and webinars (see Biasutti et al., 2015; Cela et al., 2016; Harasim, 2017).

GOOD PRACTICE EXAMPLE

One of the interesting examples of the collaborative learning approach in ALE is the project Community Education Facilitating (CEF, 2020) supported by Erasmus+. It focuses on fostering the implementation of community education in regional communities.

For this aim, it uses introducing roles of “Community Education Facilitator” and “Community Activist”, both are responsible for facilitating and developing process of collaborative learning in everyday settings of local communities. They increase rates of INFOL activities as well as NFE events with cooperative potential.

Community Education Facilitators are individuals who are trained professionally to integrate community development processes into community education processes and vice versa. Contrary, Community Activists are volunteer experts who try to get community-based learning processes going. These can consist in forms of embedded learning, i.e. where other activities are the focus but where learning forms an integral part of the whole or in initiating proper learning activities and embedding them locally – as, for instance, in the form of new places of learning, learning partnerships, learning cafés, etc. (see CEF, 2020).

Experiential learning

In the context of job-oriented education and training, activities and tools oriented to learners' experiences connected with LENV emerge as one of the most relevant for adults (see, e.g. Tynjälä, 2008). This type of learning should be realised mainly through a new or challenging working tasks with immediate assessment and reflection that have the highest impact on learners (Fenwick, 2003). In this case, experiential learning should lead to better motivation because it draws from the everyday experience of adults that is understandable for them (Wesiak et al., 2014).

The effectiveness of experiential learning is based on the direct connection between the learners' workplace environment and the support of consciousness reflection of this environment (e.g. learning goals, external obstacles, cognitive and emotional load, internal limitations, and opportunities for self-development a self-transformation). The intentional reflection of these various elements of LENV not only helps learners to see progress in the acquisition of their skills and knowledge, but is also helps them to cope better with stressors and to reduce negative emotions. If they are able to share their emotions or at least identify their source, it is much easier to get rid of them. This is important because otherwise they can turn to effort avoidance and disengagement to learning. Promoting reflexivity, in this case, translates into an improvement in self-directed/self-regulated learning skills (Boekaerts, 1993, 1999).

According to Wesiak et al. (2014) study, the tools useful for enhancing individual experiential learning in workplace settings are: (1) reflective note-taking during and after work (work diary); (2) motivational support towards job tasks from educators/mentors/learning and development staff of the company; and (3) reinforcement of regular feedback from both employees and their managers after completion of a work task. In this regard, instructors play an important role in experiential learning. They support reflection through instructional methods both during the learning activity and after its completion.

Nevertheless, we should add that experiential learning should not be limited to these tools. One of its leading promoters, T. Fenwick (2003), has described several other dimensions of experiential learning, for example, a reflection on participation in a "community of inquiry" or in other forms of collaborative learning practice. However, we suppose it can also be a reflection of a dominant ideology in discourse, unhealthy habits or oppressive social norms. This version of experiential learning draws more from humanistic, emancipated non-job learning, and represents critical preconditions for meeting the challenges that adult life brings along.

GOOD PRACTICE EXAMPLE

Experiential learning could be developed in many ways. One of them offers the project supported by Erasmus+ CREATive Urban Sharing in Europe (Creatuse, 2020). The main aim of the project was the development of learning to be creative in urban areas thanks to the improvement of the level of key competences and skills of citizens.

The project enables participants to learn through so-called "open space methodology" and "World Café method" that lead to the high involvement of learners and strong learning experience. Both methods and the case studies based on them are described in the deliveries of the project (OST & VCM, 2020).

According to the project team, open space methodology can be understood as an innovative way to conduct conferences. The standard speaker-audience setup has been replaced by a postmodern approach which invites all of the conference participants to become presenters. There are no scheduled speakers, no predetermined agendas and hierarchy or pecking order. The emphasis in open space events is on universal participation as everybody has the chance to participate on an equal footing (OST & VCM, 2020, p. 5 ff).

The World Café method initially operates with a "large circle" conversation in a small group of business and academic leaders about a specific topic. The method represents a structured conversational process aiming to facilitate open discussion and intimate conversation, to link ideas emerging from large groups, to access the "collective intelligence" of the room. In order to reach this, it is set beforehand one, or a group, of specific questions to that World Café. A café ambience is created in order to facilitate the conversation, and the participants move from one table to another and continue with the discussion on the specific question(s) (OST & VCM, 2020, p. 24 ff).

DOL as LENV for ALE

The application of DOL is described as the most common way of LENV innovation for adults. Why is DOL so prevalent? Firstly, it offers opportunities to realise ALE without compromising/conflicting with work and/or family duties (Hošková-Mayerová et al., 2015). These are the main barriers of adult participation in ALE in the last decade in many around the world (Cross, 1981; Hovdhaugen, & Opheim, 2018). DOL enables rescheduling learning time and space (OECD, 2013) and operates with them according to a learner's personal needs. Secondly, learners can access information quickly and spontaneously, which facilitates the effectiveness of learning and an access to educational resources (Merriam & Baugartner, 2020). Thirdly, according to Nygren et al. (2019), the digital era promotes a high demand for digital skills. Therefore, it is natural that lifelong learning has become progressively oriented towards meeting this demand.

Currently, the predominant part of the new educational resources is digital, and INFOL seems to be positively associated with them. However, adults are not equal in access to these resources nor in skills for their practical usage. They are digitally divided (Chen, & Wellman, 2004). Although some scholars (Merriam & Baugartner, 2020; Rosen & Vanek, 2017) have recently pointed out that with the growing usage of new technologies (e.g. smartphone), more individuals can access the Internet, which results in more equality in access to INFOL resources, it does not translate into a complete removal of this inequality.

The reason for this lies in the fact that inequality in DOL skills persist to exist. According to Nygren et al. (2019), 50% of European adults aged 16 to 64 years had insufficient skills to cope effectively in this environment. In addition to that, according to Hämäläinen et al. (2015), more than two-thirds of European adults without vocational education and training have weak digital skills and are unable to solve problems in a technology-rich environment. Simultaneously, the lower level of these skills is usually associated with higher age, lower level of education (ISCED 3 and lower), gender (women have a lower digital skills than men) and work-related factors – routine workers in services and industry have significantly lower digital abilities than workers with non-routine work task (Hämäläinen et al., 2015).

Very similar results are reported by Horrigan (2016) for the USA population. According to his research, 14% of adults were unprepared for any type of DOL (mostly women aged 50 and over, who have lower economic capital and lower level of attained education). Another 33% of adults were "reluctant". While they had higher digital skills than the previous group, they did not know how to use DOL technology and did not use it for acquiring knowledge and skills.

Many articles (see, e.g. Rosell-Aguilar et al., 2013; Alhabeeb et al., 2018, VasIU et al., 2011, Rivera-Nivar et al., 2010; Delialioglu et al., 2010; Petrakou et al., 2010) have also found difference in willingness to use different types of DOL as open educational resources (e.g. iTunes, Spotify, Facebook, YouTube). Despite their variations in samples, populations and research design, the studies enable us to conclude that women and older adults are less willing to use open educational resources for their job-oriented learning or as a part of the NFE. On the contrary, both older adults and women are less hostile to use these resources in the case of their non-job oriented learning and INFOL.

Despite these structural limitations, many authors defend the systematic application of DOL in LENV for ALE because it can lead to many benefits:

1. flexibility and accessibility (Rosen & Vanek, 2017);
2. effective personalisation of learning (Hošková-Mayerová et al., 2015);
3. enhancing collaboration between learners in the case when the tools for collaborative learning are a part of the DOL design (Viberg & Grölud, 2013);
4. elevating of enjoyment and engagement for some groups of adults, usually the younger generation (Pop et al., 2011);
5. improvement of satisfaction and the level of knowledge if obtaining clearly defined sets of knowledge (Chuang et al., 2013).

Blended learning (sometimes also referred to as "hybrid learning") represents the most frequently used form of DOL in LENV for ALE. According to Merriam & Baugartner (2020), education utilising these principles contains courses that blend online and face-to-face delivery, a substantial portion of the learning content is delivered online and the number of face-to-face meetings is reduced. This type of asynchronous organisation of learning offers flexibility in terms of time and space to a diverse adult population. Moreover, it still enables some face-to-face interaction via regular classrooms, text or video chats, and forums that drive interactive and social aspects of learning.

The effective utilisation and impact of blended learning and DOL resources depends on several factors:

1. Task design: Tasks should be constructed around the real-world experience of learners. They should work with content understandable for learners, which leads to results that are transferable to their everyday life (see also the principles of "experiential learning" above). In a brief conclusion, they should respect learners' needs and differences between different subgroups of learners among adults (Boelens et al., 2018; see also the principle of "personalisation" above).
2. Instruction and learning support: Learning content has to be supported by systematic and clear instructions from educators and their active participation in the learning process (Ahabeeb et al., 2018; Rosen & Vanek, 2017; Unger et al., 2013). For example, Chu et al. (2010) have found that adult learners with lower self-efficacy in DOL need a higher level of social/family support for effective DOL. According to Ma'arop and Embi (2016), learners with a lower level of DOL skills need more face-to-face instruction, interaction and prompt feedback from educators and they also need more technical support at the beginning of the learning activity.
3. The systematic support is also connected with attention. One of the disadvantages of DOL is that it fails to maintain learners' attention in the long-term (Davis et al., 2018). If DOL is to be successful in the long-term horizon, it needs to utilise systematic feedback and enhancement of learners.
4. The usage of blended learning in job-oriented ALE: The utilisation of blended learning in workplace environment always depends on the company management and support on the one hand, and employee motivation to use DOL on the other hand (see Chen et al., 2012). If employees have enough encouragement from their management and help in a concrete learning task, they perceive the usefulness of DOL more than in a situation of their absence. As a result, it subsequently influences their motivation to use DOL.
5. Digital skills: Wang et al. (2013) claim that digital skills are more critical for using DOL than the age and life stage of learners. Contemporary literature emphasises that most adults are still not digital natives (Merriam & Baugartner, 2020; Nygren et al., 2019; Rosen & Vanek, 2017; Vasin et al., 2011). Without enough skills in this area the usage of DOL is useless and ineffective for ALE.

The more advanced the DOL tools are, the higher level of digital skills is required for their practical usage.

6. Collaborative aspects: In the same way, it is essential to foster an active learning culture in DOL (Hošková-Mayerová et al., 2015). Active is here understood as supportive from the side of educators. Nevertheless, it also means proactive from the side of the learners, as self-directed/self-regulated actors. According to Rojko et al. (2011), discussion forums are one of the best supportive tools that can enhance collaborative practice and students' engagement in DOL. Baran et al. (2013) also add the frequency of communication which establishes trust among members of the learning group.
7. Instructor training: Educators need to be trained in the practical usage, application and design of DOL because most of them have not had this type of training (Ma'arop & Embi, 2016).
8. Lower quality of learning experience: Some scholars (Vanslambrouck, 2019) point out that another disadvantage of DOL lies in lower quality of learning experience (less emotional engagement and interaction, lack of adequate and immediate feedback and assessment). Separation in time and place during the learning process reduces the ability of instructors to observe their students learning behaviour and provide tailored support.
9. The interface of DOL: Scholars (see Alhabeeb et al., 2018; Unger et al., 2013; Rivera-Nivar et al., 2010; Rojko et al., 2011) have concluded that learning interface should be easy to access, personalised and straightforward. The optimal interface ensures a high level of satisfaction and information recall, as well as low level of disorientation and task workload.
10. Unfortunately, it can be accomplished only partially if the age of learners is not targeted. For older adults, it is necessary to use: (a) narrative type of information/instruction, (b) larger video format with realistic background, (c) larger text font and (d) to avoid coloured text (Rivera-Nivar et al., 2010; Rojko et al., 2011).
11. In addition to that, Wolfson et al. (2014) add their own insights into the personalisation of DOL according to cognitive and socioemotional changes associated with ageing. According to their insight, this type of DOL should: (a) be highly-structured, (b) provide feedback, and adaptive guidance, (c) include metacognitive prompts, (d) incorporate principles derived from cognitive load theory (self-paced instruction and removing information that is irrelevant to the learning goal), and (e) use an interface that is simple and consistent throughout the course.

GOOD PRACTICE EXAMPLE

The specific usage of DOL for ALE represent the project “Real Life” (ReLife, 2020). It focuses on the development of crucial skills and social inclusion of prisoners through DOL learning settings, in this case, virtual reality and gamification.

For learning skills needed for employability and life outside the closed facilities, the project delivers an innovative blended learning environment based around five types of learning games. These were developed in cooperation with prisoners and personalised for their usage. These games train specific skills like social media awareness, self-knowledge when it comes to personality traits, self-management, communication and cooperation. Based on them, it

was prepared a plan for the reintegration of every participated prisoner. In parallel with that, the project also facilitated a guide for mentors and educators working in prisons.

Participants and implementers of the project highlight that DOL contributes to employability and reduces possible recidivism of prisoners. Many among the end-users have learning disabilities and reject more traditional teaching approaches. This project shows that the development of new, innovative and INFOL possibilities can be rewarding for disadvantaged groups.

Instruction, learning support and assessment

The role of educators of adults has changed. They have been traditional teachers in a lesser degree, and they have progressively become more of instructors, facilitators or coaches. What does not change is their essential part in the learning feedback. James Clear in this context highlights its importance for the acquisition of knowledge and skill: "When feedback is immediate, clear and concrete, people learn quickly. When feedback is delayed, abstract and opaque, people rarely learn" (Clear, 2018).

The literature (see, e.g. Arbaugh, 2010; Erhel & Janet, 2013; Unger et al., 2013) lead to an agreement that effective LENV without systematic instruction is not possible. In this context, instructions do not help only learners to focus on their tasks efficiently, but they also help instructors to engage actively with their students (Arbaugh, 2010). It is twice as accurate in the case of DOL, and when learners are less experienced or have lower DOL skills or self-efficacy (Boling et al., 2012).

According to Erhel and Janet (2013; see also Unger et al., 2013), learning instruction elicits deeper learning and leads to more robust and faster fixation of knowledge and skills than in the case of unstructured learning.

The reviewed literature describes several instruction techniques:

1. Segmentation method: According to Moon et al. (2019), this type of instruction consists of effective segmenting of a complex task into simpler subtasks. Guided participants conduct a more systematic and comprehensive investigation and report a lower level of cognitive load compared with the unguided participants.
2. Integratiion of new ideas into existing knowledge: Chen et al. (2010a) found that learners who receive regular integration prompts are more efficient in the development and integration of cognitive schema while learning a foreign language.
3. Introduction of reflexivity: Learners that are instructed to use any tools (for more details see below), for developing reflexivity of their knowledge experience and the level of skills tend to have a more positive experience about their learning.

Motivation support and forming positive emotions related to learning

Many scholars (Boekaerts, 1993, 1999; Zimmerman & Schunk, 2011) have agreed that motivation is not a fixed entity, neither an inexhaustible resource, but it is continually changing and strictly limited

resource. For this reason, it has to be regularly checked, recharged and enhanced. If the LENV is less structured (usually in the case of INFOL), learners are more dependent on their sources of motivation (their LENV) and have to develop a practice for self-motivation as well as design their environment in a way that enables and enhance an adequate level of their motivation.

In the case of more structured learning, OECD (2011a, 2011b, 2013) stresses that an educational organisation, whose pursuit is building a quality LENV, needs learning professionals who are highly attuned to the learners' motivations and focus on the crucial role of emotions in achievement. If not, it is the primary outflow of learner attention in LENV (Kim & Frick, 2011). In this regard, educators should enable adults to experience a feeling of success regularly and make it visible; it should be an explicit topic in interviews between learners and educators. Also, learning goals should be tailored to each capability, and the regular provision of individual feedback seeks to ensure that each adult meets with success (OECD, 2013, p. 165).

Emotions are closely related to learning motivation. It is because every learning is connected with self, self-perception and preventing a threat to self – a self-defencing mechanism that people use for maintaining a positive self-image (Boekaerts, 1993, 1999). Based on that, we should take care of not only gaining knowledge and skills, but also about the coping process accompanying learning, coping with stressors and reducing negative emotions. Any improvement in emotional experience, which leads to higher learning satisfaction strengthen willingness to learn.

In the context of designing LENV, it is highly relevant to foster positive emotions related to learning, especially in DOL settings, where weaker social interaction and weaker stimuli for experiencing positive emotions can be observed (see Lucardie et al., 2014; Münchow et al., 2017). For example, according to research by Münchow et al. (2017), adult learners with initially positive emotions are superior in comprehension and transfer of learning. Additionally, Lucardie et al. (2014) found that positive emotions encourage concentration and help with the absorption of learning and social connectedness.

Assessment

High-quality LENV for ALE should operate with clarity of expectations and should deploy assessment strategies consistent with these expectations; there should be a strong emphasis on formative feedback to support learning (OECD, 2013).

In this context, scholars (Lancaster, 2020; Mauzuoli et al., 2016; Parrish & Beaubien, 2020) claim that continuous formative feedback, together with reflective practice, leads to effective LENV in working conditions. According to Brill et al. (2011), one of the innovative tools in this regard is an application of peer review, which can support design collaborative- and problem-oriented learning. Furthermore, it forms an authentic experience that leads to higher satisfaction with learning.

An innovation in assessment is also related to the incorporation of validated scales that can be used for evaluation of quality and effectivity of LENV as well as learners' results and experiences (e.g. their emotions and feelings about realised education activities, their relationship to educators, or the meaning and benefits of completed learning). Several scales exist for this aim. One of them is "Noel-Levits adult students priorities" scale (Giancola et al., 2008); another one is POINTS – "Power and Influence tactics scale" used by Hendricks (2001). Last but not least, a specific questionnaire focusing on the nature of learning among elderly was prepared Maureen Tam (2016; Tam & Chui, 2016). Her work is useful to understand the experiences of and benefits for older learners.

The new content of learning

Several new skills emerged as the new content of learning that is useful for adults in the process of lifelong learning; there are self-regulated, self-directed learning skills, teamwork and social skills, mindfulness and ICT, DOL skills.

Many scholars (see, e.g. Botha et al., 2016; Chen et al., 2011; Sze-yeng et al., 2016; Zimmerman & Schunk, 2011) are convinced that learning of adults should foster the development of self-regulated and self-directed learning. This specific set of metacognitive skills is empowered through learning tasks supporting constructivist collaboration in both physical and virtual learning spaces (see Sze-yeng et al., 2010).

Self-regulated learning skills develop over time with practice, feedback, and observation. According to Zimmerman and Schunk (2011), they are developed in four stages that contain: (1) process of observation; (2) emulation; (3) enhancement of self-control and (4) acquisition of self-regulation. However, the process of self-regulated and self-directed learning formation has its limits. If learners experience a high cognitive load when performing novel tasks, they can have a problem to go from one stage to another. For this reason, we have to design instructional environments to minimize the impact of cognitive loads on learners. Only then the Self-regulated learning skill approach could be used effectively.

Educators play a vital role in the process of building self-regulated and self-directed learning skills. According to Gomes et al. (2013), they can support meta-cognitive activities such as self-control, self-expression, and self-reflection. The authors suppose that one of the most efficient ways how to promote them is through authentic, socially situated discussion, reading, writing, and media production (Gomes et al., 2013). For these activities can be used both, the "open space technology" and "the world café method/ described above or intentional note taking and blogging about specific topic.

Another crucial set of skills is connected with communication, social skills and teamwork. These skills are more than ever necessary for cooperation in the workplace and should be a part of broader qualification profile for adults intending work in services or job-positions that are dependent on regular interaction with a number of people (CEDEFOP, 2018; OECD, 2019a).

One of the newly proposed contents of learning is mindfulness. It has a significant impact on learning itself (as an ongoing activity) as well as on the ability to learn in different LENV contexts. According to Jennings et al. (2013), it reduces stress and improves adult learners' performance. In this regard, the most common tools for enhancing mindfulness are meditation, breathing and relaxation techniques. Many of them are able to decrease stress and anxiety connected with learning, enhance coping mechanisms and improve the experience of learning.

The process of digitalization brings new requirements for DOL skills. Adults without necessary digital skills will be less likely able to manage their financial sources, access various government services and will have a higher chance that they suffer from isolation and have lower incomes. Skill mismatch in this field also strongly influences job prospects and career development of adults (CEDEFOP, 2018).

Innovation in job-oriented NFE

The field of job-oriented training has long been one of the most dynamically developing areas of education. Due to the high level of competitiveness among companies, technological innovations, and changes the character of work, LENV for adults is changing very quickly and is coming up with new ways to organize learning. At present, we can observe several important trends in the job-oriented LENV that make innovations not only in the resources and organization of learning but also in the notion of learning and its functions.

The first trend is the non-separation of work, learning and technology. All three phenomena follow each other, as it was described by Nigel Paine (2019, p. 220): "There is no way now to separate work, learning and technology. They feed of each other and each one makes demands that the other two have respond to." As a result, both experiential and collaborative forms of learning described above are significantly strengthened.

The second trend is to emphasize the role of informal learning. Mutual social learning in the work environment is not perceived as a secondary one, but as paramount for the functioning of the organization. It is considered more effective, as it increases the adaptability of the organization, and also more suitable for individuals, especially when it is significantly personalized.

For this reason, experts pay attention to creating an appropriate "learning culture" and tools that would support mutual social learning and would make it an everyday habit of employees. According to Josh Bersin (2017), workplace learning no longer mimics school education and is not focused on cumbersome educational modules, courses, and training, but it involves mutual learning from colleagues and from professional networks. The new job-oriented LENV meet these requirements.

Another critical trend is including the requirement for speed, flexibility, and agility of learning. Based on that, new ways of creating learning opportunities (e.g. so-called agile learning), including work with educational content (curating instead of creating new educational content) and significantly shorter and more flexible learning models (high frequency and regularity of everyday opportunities for learning through the so-called micro-learning or frequent interaction with colleagues instead of homogenised and long-term courses). The aim of creating LENV is not to build complex and robust corporate

education systems for all employees (one-size-fit-all), but to introduce easy-to-implement, short and highly personalised educational events based on the principles of agile and mutual social learning.

Such an organization of learning also requires the creation of a suitable "learning architecture," which allows to stimulate natural INFOL and to implement agile learning events focused on the current needs of the organizations. Therefore, the fourth important trend in the field of job-oriented ALE is the creation of a new physical and virtual environment that enables such events.

In view of these four trends, we will further focus on a more detailed description of specific innovations that are considered effective in improving the quality of LENV.

Building a culture of a learning organization

Successful LENV in working conditions requires not only effective monitoring of the educational needs and support from the learning & development department (L&D), but also the development of a corporate "learning culture" (see e.g., Kearns, 2015; Lancaster, 2020; Paine, 2019). This is understood as a set of values, norms, patterns of behavior and symbols that are associated with the approach to education in each organization and that are passed on through socialization and enculturation. The learning culture influences how education is valued, developed, and supported in each organization. Where the culture is strong, it contributes to creating a natural social environment that supports the adult learning process, both in terms of the inclusion of individuals in the learning process and in terms of improving the effectiveness of corporate education and INFOL.

According to Lancaster (2020), the following attributes are considered to be the core of the learning culture: (1) tolerance and appreciation of mistakes and challenges as opportunities for learning and development of individuals and organizations; (2) the management encouraging the employees to experiment and innovate, including the delegation of responsibility for self-learning to members of the organization; (3) the commitment of the whole organization to use learning to improve its own operating and to enrich one another; (4) building mutual respect and openness in sharing knowledge and experience.

As for creating a strong learning culture, Nigel Paine (2019) points out that it must be based on clear intentions regarding learning goals. These must be obvious not only to the company management but also to the employees and customers. If they are not clearly defined from the beginning, leaning may merely become an ineffective formalism. According to him, a strong learning culture can be developed through ten key steps (Paine, 2019, pp. 214–216):

1. Facing the reality and challenges it brings. It must focus on the challenges concerning staff skills and their development.
2. Defining the values on the basis of which the organization wishes to function and which determine the meaningfulness of their educational activities.
3. Making learning culture transparent to all members of the organization and basing its implementation on a dialogue among all employees of the organization.
4. Proactively creating cross-organizational groups, appreciating diversity in the company and encouraging employees to work across its vertical and horizontal structures.
5. Celebrating any small success in the form of a positive change in learning within the organization, including the appreciation of its bearers.
6. Encouraging individuals to learn daily. Intentionally creating time space for such activity during working hours. Guiding employees to share as much information as possible.

7. Creating an open space for collaborative learning, both physical and virtual.
8. Requiring that each member of the organization have their own curriculum for the development of their careers and for the deepening of professional competencies.
9. Encouraging employees to ask questions about the functioning of the organization and ensuring that they are answered regularly.
10. Focusing the content and objectives of education on the specific challenges that the organization is currently facing.

Transformation of planning and implementation of job-oriented training – agile learning

One of the current trends in the organization and preparation of corporate education is a high emphasis on its agility. Companies and organizations need to adapt to more frequent changes in their external and internal environments, increasing demands for innovation and adaptability of the workforce, and updating the knowledge and skills of the employees. For this reason, an effective LENV in workplaces should be quick and easy to design and redesign. An agile LENV is characterized by the acceleration of the preparation of training courses and programs that respond to the emerging training needs of the organizations and their employees.

According to Lancaster (2020), the agility of LENV is increased by the creation and implementation of "prototypes" of educational courses that are not specified and developed in detail, but meet predefined minimum standards for the quality of individual training. Subsequently, this prototype is evaluated, and based on that, supplemented, modified, and further used.

An agile approach to employee training also changes the way of work with the content of training. Educators and other persons from L&D are no longer primarily responsible for creating educational content for employees, but rather for its curation – for selecting, editing and delivering educational content to specific learners to whom they are tailored according to their needs.

Time organization of education – micro-learning

Another new trend in the field of job-oriented learning is the application of the so-called "micro-learning". According to Nikos Andriotis (2018), this type of learning includes short sections focused on small, well-defined topics that allow the goals of the organization to be achieved in a cumulative form. These are most often small units of learning, in which the learners are sent short educational units: texts (short paragraphs), photographs, videos, tests, or quizzes.

In today's world of work, time is one of the most expensive components (Paine, 2019), so organizations focus on using short periods of time (up to 5 minutes) to train the employees in the most relevant skills and knowledge that they need to perform their work and which can significantly streamline the learning process. Thanks to its shortness, micro-learning can be integrated into the daily practice of organizations without significantly disrupting their operation. As we have seen above, one key requirement of contemporary job-oriented training is met by that – the integration of work, technology and everyday INFOL.

The new learning architecture

In terms of the focus of most studies, the physical environment (i.e. the architectural layout of the space of educational institutions, the work environment and classrooms) has a secondary role in the research of LENV; especially if we compare it with the prominent position of DOL. Like socialization, for example, it usually forms an implicit part of the learning process and is not specified or theoretically conceptualized, let alone its influence being empirically measured. If the role of the physical environment in learning is discussed, it is in the case of topics related to the effectiveness of work and learning.

Publications from recent years (see, e.g., Clear, 2018; Newport, 2019) point out that the physical environment and the number of disturbing or distracting stimuli in it can significantly disrupt the learning process. If an individual really wants to concentrate and devote himself/herself to "deep learning/work", he/she must have a physical space created where they are not disturbed and distracted.

Such a requirement is in clear contradiction to the concept of informal learning in the workplace (see below), which emphasizes the importance and role of co-working spaces. On the one hand, they are an excellent architectural aid for the rapid sharing of information and building a culture of openness, but on the other, they significantly limit the process of deep learning itself. Organizations must therefore strive for both - for independent, individual, and deep learning as well as for creating a physical/virtual space for sharing/collaboration and social learning.

Collective offices and other types of co-working spaces are designed to increase the number of employees who can work in one space, sharing one work station and using the building equipment (Felstead & Jewson, 2012). This type of workspace is often supplemented by rooms that can be transformed into various ways for the purpose of small meetings, trainings and meetings face to face, or into separate cells that allow individual work.

Due to that, they are a suitable tool for carrying out some of the partial steps in creating a strong learning culture mentioned by Paine (2019) or Lancaster (2020). They can contribute to information sharing, encouraging asking questions, transparency of learning, creation of cross-organizational groups, or direct support from the managers.

The main principle of "collective offices" is to create a natural environment for encouraging interaction, sharing thoughts and ideas, and making contacts. In other words, they are a suitable facilitator of everyday social learning in the workplace. According to Felstead and Jewson (2012, p. 149), this type of architectural design not only promotes open informal conversation, but also leads to the development of social skills and social intelligence.

Another crucial trend in the physical environment of workplace learning is the development of work from home. It changes the overall concept of job-oriented LENV. In the last decade, the number of people working from home in the EU has doubled, as has the number of workers who spend at least one day a week working from the place where they live (EWCS, 2015). For this reason, learning space at home has significant implications for job-oriented education as well. The developments in work organization associated with the spread of COVID-19 appear to exacerbate rather than attenuate this trend (see, e.g., Boeren et al., 2020; Waller et al., 2020).

However, people working from home need to balance the boundaries between their working and non-working lives and proactively create a physical environment that allows them to focus effectively on work and learning. Many distracting stimuli can impair their concentration and work efficiency, and also reduce motivation to learn. In addition, due to their physical separation from other colleagues, they may more often experience feelings of loneliness, or they may lack feedback on their work/learning activities

(Felstead & Jewson, 2012). For this reason, it is important to involve persons working from home in employment networks – in the working "community of practice" (Wenger, 2018) – and provide them with systematic feedback from the managers.

Social learning in the work environment

Classics of the theory of learning in the workplace (Argyris, 1992; Illeris 2004; Wenger, 2018) agree that people primarily learn in the work environment informally: by observing colleagues, by imitating valued behavioural patterns, or by talking over a cup of coffee when they share knowledge about the operation of the company, about solving frequent work-related problems, and about professional know-how.

Some scholars (see e.g. Messmann et al., 2018) from the last few years emphasize that mutual social learning on the principle of collaborative learning or "community of practice" (Lave & Wenger, 2016; Wenger, 2018) is much more important for the dynamic development of a strong learning culture in organizations than formal training courses.

If organizations want to develop social learning in the workplace, they should create both material and temporal conditions. Through the "formalization" of these elements, they can much more intensively build an environment that supports mutual learning and increases its frequency, depth, and impact.

To meet this premise social learning needs to be systematically supported by the organization's management, which should lead by example. At the same time, it is necessary to invest time in this type of learning during working days, weeks and months – i.e. to formalize the timeframe for individuals in the organization to participate in it; for example, it may be an informal discussion one day a week or an extended lunch break that can be used effectively for this purpose (Lancaster, 2020).

Last but not least, it is necessary to create a place for mutual social learning where it may be dynamically developed. In this respect, it should not be a traditional formal learning space in the form of classrooms, but a place that is suitable for natural informal learning (for more details, see below – The new learning architecture). At the same time, it is necessary to build a DOL environment enabling meeting and asynchronous information sharing.

The next section of the report explores what should be done if we want to make works place more supportive for INFOL.

INFOL in work settings: Expansive learning environment and tools for its formation

INFOL in everyday working life is considered one of the most important ways of adults' learning (Kearns, 2015; Lancaster, 2020; Paine, 2019). Compared to formal education, it is no longer considered secondary or inferior, but a full-fledged form of work-related training (Wheeler, 2019).

INFOL makes it possible for us to learn the basic rules of organizations (their values, standards, and role expectations) and to share skills and know-how, in addition to bringing inspiration. Also, it is associated with the specific life experience of adults, so it is directly relevant to learners, enhancing its meaningfulness which is the main reason for most adults to continue in their learning (Eagleman, 2020).

For this form of learning the characteristics of the workplace environment are crucial as they directly affect what this learning looks like – how much people can learn from each other, if they can participate

in it, what frequency the learning has, and how much adults can benefit from it. Due to that, the work environment is also a learning environment, and some researchers (e.g., Massman et al., 2018) believe that they are inseparable. The learning process and the learning context, the learners and the organizations, permeate and shape one another.

What are then the features of a workplace environment that makes it possible to encourage mutual social learning? One possible answer to this question is offered by Alison Fuller and Lorna Unwin (2004, 2013) in their distinguishing between "expansive" and "restrictive" aspects of the workplace environment. Based on the theory of social and situational learning by Etienne Wenger (Lave & Wenger, 2016, Wenger, 1998), the authors created a categorization of features that enable or hinder the development of informal learning.

They used two sets of characteristics to describe a workplace environment. On the one hand, it is about understanding the organizational context and culture of the organization, and on the other, how employees in the organization learn through various forms of participation. They describe an environment that is highly inclusive and reinforces informal learning as "expansive", while they label an environment where such forms of learning are hindered as "restrictive". There is a relatively broad continuum between these two where most organizations operate.

The checklist of ten basic attributes of an expansive learning environment, which organizations can check below, contains the following items (Fuller & Unwin, 2004, p. 136; 2013, p. 52):

1. Participation in different communities of practice is encouraged.
2. Primary community of practice has shared participative memory.
3. Vision of workplace learning.
4. Recognition of and support for workers as learners.
5. Workforce development used as vehicle for aligning goals of the organization and of the individual.
6. Skills widely distributed through workplace.
7. Multi-dimensional concept of expertise.
8. Deeper learning beyond immediate job requirements.
9. Managers given time to support workforce development and facilitate workplace learning.
10. Workers given discretion to make judgements and contribute to decision-making.

As part of a challenging but extremely valuable road to building an organization with an expansive learning environment, a variety of tools can be used as described in the current literature (Kearns, 2015; Lancaster, 2020; Massman et al., 2018; Paine, 2019; Wheeler, 2019). Persons responsible for Learning & Development in a certain organization can create from them a repertoire of measures "tailored" to requirements of the organization.

Tools for increasing participation in different communities of practice

- Systematic involvement of employees in various work teams. Using the principle of short-term and medium-term rotation of work.
- Guiding employees to actively build personal learning networks related to their tasks, professions or sector of activity, e.g. through social networks (LinkedIn, Twitter, etc.), web tools (blogs and discussion forums), or education outside the organization (conferences, seminars).

Tools for building shared participative memory

- Creating repositories of information materials to which all members of the organization have access. Enabling the widest possible participation in sharing information and experience.
- Organizing regular events to promote shared learning (discussion groups, internal meetings and conferences) with an emphasis on the personal experience of the participants and the opportunity to actively participate in debates and in sharing information and experience.
- Selecting the topics of such events based on the current educational needs of the employees, using them to regularly monitor educational needs and to give feedback on the quality of informal learning in the organization.

Tools for creating vision of workplace learning

- Making social learning one of the core values of the organization, promoting it and systematically making it visible and rewarding.
- Formulating a clear position of mutual learning for the further professional growth of the employees both within the organization and within their fields of work.
- Including the building of a strong culture of mutual learning among the strategic goals of the organization.
- Unambiguously defining the functions and benefits of informal learning for organizations.

Tools for support workers as learners

- Creating a specific time space for mutual learning during the working day, week and year (e.g. in breaks during the day - a longer lunch break, or at the end - short reflective meetings).
- Using appropriate physical spaces (architectural layout) as well as virtual infrastructure (e.g. the existing social networks, discussion forums and other digital communication platforms) to support informal learning.
- Motivating newcomers to actively engage in communication and information sharing. Using both formal or informal mentoring and coaching to achieve this goal.

Tools for interlinking workforce and organization goals

- Unambiguously defining the functions and benefits of informal learning for the organization and for each employee.
- Linking the educational goals of individuals (their individual career and educational plans) with the educational strategy and business strategy of the organization.

Tools for widening distribution of skills through workplace

- Building interdisciplinary work teams where individuals can gain new knowledge and skills.
- Disseminating the educational content based on "best practice" through information brochures, case studies, newsletters, etc.
- Identifying the holders of key skills and subsequently motivating them to pass on the key skills to other members of the organization.

Tools for enhancing multi-dimensional expertise

- Building interdisciplinary work teams.

- Systematically obtaining feedback from the external environment on the key tasks and challenges of the organization, e.g. through invited experts, etc.
- Involving experts from the external environment in the functioning of the organization.

Tools for deeper learning beyond immediate job requirements

- Enabling the employees to deepen their key skills in areas critical to the organization over a longer period through weekly, monthly or semi-annual sabbaticals.
- Using mentoring and coaching outside the organization.
- Using internships in other organizations.

Tools for increasing involvement of managers in learning

- Making involvement in informal learning one of the main activities of the managers. Allocating part of the work capacity to actively encourage social learning and support the employees at work.
- Motivating the management to a thorough analysis of educational needs for the implementation of the strategic goals of the organization and for coping with challenges the organization faces.
- Evaluating the contribution of informal learning for changes in teamwork and achieving positive changes in the organization.

Tools for engagement of workers

- Involving the employees in the choice of goals and forms of education, including an assessment of its contribution to the work of each specific employee.
- Supporting the employees in self-regulated learning and forming their ability of self-directed learning. Supporting the self-reflexive practices of employees, e.g. in the form of creating "critical" work notes, self-reflective diaries, or suggestions to improve their own work and the operating of the organization.
- Involving the employees in the creation, adjustment, and dissemination of the educational content, making them co-creators and actors in everyday educational practice.
- Having a tolerant approach to the employees' mistakes, analysing them regularly. Encouraging sharing and experimenting, e.g. through the managers' targeted mentoring/coaching.
- Using an inspiring and informal environment (e.g. cafes, places outside the organization, etc.) to deepen the appeal and inspiration of mutual learning.

The new role of educators

One of the important accompanying aspects of the development of adult INFOL is the new role that educators play in LENV. The scope of their activities is no longer just lecturing or creating and organizing educational courses. To a greater extent, they are becoming managers of human relations, facilitators of interaction with learning resources and other peers, curators of the learning content, coaches, mentors and motivators.

MACRO-LEVEL FACTORS INFLUENCING LENV FOR ALE

In the recent years, the studies about LENV dedicated only little attention the issue of participation, barriers to learning and equality. Their predominant part focuses on adults who are already participants and not on the point of entry or in the stage of decision-making about participation. It is due to a strong orientation on individual learners (micro-level) and particular organisational/institutional characteristics of LENV (meso-level).

Questions about policy focusing on LENV and the role of stakeholders are lagged behind. Despite this orientation of the discourse about LENV for ALE, OECD (2013) argues that policy should actively promote "horizontal connectedness" across areas of knowledge and subjects as well as to the community and the wider world. This approach is even more present in the most recent UNESCO (2020) report „Embracing a culture of lifelong learning,“ which outlining future direction of lifelong learning policy.

Ragardles studies about LENV have been oriented more on actual learners and their environment than on potential learners, their inclusiveness and possible participation in ALE, several scholars have addressed this issue recently in ALE research fields other than LENV – especially in relation to the discussion about political economy of adult education system and transformation of adult education policies (see e.g., Busemeyer, 2015; Busemeyer & Trampusch, 2012; Desjardins, 2017, 2020).

ALE development policies, measures and support tools

The formation of high-quality LENV at the institutional level is characterized by the fact that it relies on the important role of the state as an actor that is able to regulate this environment and create suitable conditions for the development of lifelong learning. States that are intensively building their systems and policies for ALE are not only able to achieve higher levels of adult participation in NFE, but also have lower levels of inequalities in such participation.

In terms of a successful practice of improving institutional conditions, we have identified two main approaches. The first is the state-centric model, which has so far gained ground in the scholarly discourse of ALE (Boeren, 2016; Desjardins, 2017, 2020; Rubenson, & Desjardins, 2009) and which focuses much more on state-implemented measures ant tools to support supply and demand for ALE. For this approach, it is also typical that highlights the role of skills, and skill-formation. For this reason, it is more oriented towards job-oriented education and training, is more economic-centred and operate with the notion of social integration through labour market and welfare state system.

The second is the more general model of building a culture of lifelong learning carried out by UNESCO (2019, 2020). This approach focuses on a holistic and social understanding of the phenomenon of lifelong learning, for which it wants to create preconditions for higher levels of relevance and willingness to participate in ALE at various levels of society (e.g. in the legislative system, education organization, and value orientation of citizens). Bottom-up processes are more characteristics of this framework. Contrary to the previous one, it stresses more social integration through the non-profit sector, civil society and does not focus inherently on job-oriented education and economic incentives of lifelong learning. The leisure and social aspects of learning have equal importance.

State-centric approach

One of the unifying frameworks for measures to create an inclusive environment for ALE is the systematic expansion of educational opportunities across people's life-span. This includes both expanding vocational training opportunities after their finishing standard vocational training and creating opportunities for civic, community or hobby education during their middle age, as well as opportunities to participate in courses and programs related to active aging.

The wider the range of these opportunities is, the more likely they are to address a more diversified group of adults who can subsequently benefit from ALE. For this reason, this type of education is not narrowly focused only on one area (e.g. job-oriented training) or on one group of adults (e.g. working middle-aged adults), but it also offers educational opportunities to people who are outside the labor market or who want to develop themselves and engage in fields other than their profession.

The state plays a crucial role in offering educational opportunities (e.g. Blossfeld et al., 2014; Desjardins, 2017, 2020). Its aim should not only be to maximize the number of ALE participants, but also to increase the diversity of participants and reduce inequalities in access to it. In this respect, the state *acts as an intermediary* that can both *regulate the supply and demand* for ALE from the part of citizens, employers and other educational organizations as well as to directly create conditions for a high (i.e. absolute level of participation) and wide participation of adults (i.e. involvement of different social groups in ALE). According to Richard Desjardins and Alexandra Ioannidou (2020) the aim should be "to successfully balance the interests of diverse social groups and to mitigate inequalities."

The more successful the state is in this balancing, the higher the participation and wider representation of social groups in ALE can be expected. In other words, the state is thus able to build a better and more inclusive macro-social environment for lifelong learning.

The current discourse of ALE (Dämmrich et al., 2014, 2015; Desjardins, 2017, 2020; Lee, 2017; Rubenson & Desjardins, 2009) agrees that those countries that have a *developed welfare system* and a sophisticated *active employment policy*, enabling the implementation of a wider and at the same time denser network of measures to support ALE, are more successful in this respect. As result of this measures, the share of people who do not participate in ALE is decreasing, and the diversity of adult learners is growing. Conversely, countries with less developed welfare state models are much less successful in this practice.

One of the limiting factors in this respect is the expenses on an active employment policy and the creation of instruments for the inclusion of social groups that may be excluded from ALE due to their origin. These are most often the unemployed, migrants, people on parental leave or people with a low level of education (Boeren, 2016; Boeren & Holdford, 2016; Kalenda & Kočvarová, 2020; Kalenda et al. 2020a; Desjardins et al. 2006, Rubenson, 2018). If the states want to intervene successfully in this area, they must also invest in it. This the reason why, according to Dämmrich et al. (2014, 2015; cf. also Desjardins & Rubenson, 2013; Rubenson & Desjardins, 2009), the countries with higher expenditures on this agenda also have a lower level of educational inequalities in ALE.

Fostering supply-side and demand-side of ALE

Richard Desjardins (2017, 2020; see also Desjardins & Ioannidou, 2020 Desjardins, Melo, & Lee, 2016) describes tools that can support inclusiveness of LENV for adults in job-oriented NFE in several of his

articles and research report form recent years. According to his analysis of adult education policy systems, the most effective practice for fostering supply-side of ALE are:

1. *promote the use of existing skills*. Always starting with skills that adults already have and then build new competencies on this basis, or prepare opportunities to use them fully;
2. *avoid low-skill equilibrium traps*. Focus on support of job opportunities that can allow using existing skills and which have adequate requirements for the knowledge and skills of adults;
3. *foster employer support*. Strengthen the external financing of ALE; allow time-off for education and training; develop flexible work arrangements helping to participate in ALE activities;
4. *promote the pooling of risks with other firms and stakeholders*. Create multi-actor projects helping to introduce quality and sustainable practices on the local level supporting all previous points;;
5. *improve coordination among stakeholders on skill needs* (e.g. between providers, unions, and other firms). Build regular platforms, round tables and groups that enable cooperation and feedback on the organisational level of local policy and introduce useful practices in this arena.

With regard to an effective inclusive policy in ALE from demand-side point of view, Desjardins (2017, 2020) point out that a public policy in this field should extend support especially to the lowest-skilled adults. Those are the most at risk by educational a social inequality that can prevents them in participation in ALE. According to his research, successful ALE policy fostering:

1. *a good skill base for knowledge economies*. It is because a significant differences still exist among adults according to their attained education and competencies (see, e.g. Desjardins, 2020; Lee, 2017). The higher the basic level, the better are preconditions of adults for both participation in ALE and their actual learning;
2. *building flexible pathways for ALE* which avoid “dead ends”, and promote non-traditional students. This strategy represents a creation of learning opportunities in formal-education (e.g. new types of distance study programmes that are more flexible in time and space), as well as NFE. In this case, especially though process of recognition of NFE and INFOL and their validation;
3. *relevant and responsive provision to an individual, employer and public demand*. Building regional policy tools for regular monitoring of demand for ALE (e.g. regional surveys focusing on both adults skills and needs and employers and public demand for skills and qualifications);
4. *flexible learning methods*. Using a broad platform of learning methods for inclusion of individual learners that helps them not just required necessary qualification or skills but also connect among each other, build social capital and positive attitudes towards lifelong learning;
5. *active citizenship*. (e.g. involving social action). Create opportunities for everyday informal community learning and cooperation on the basis of collaborative learning or community of inquiry;
6. *active ageing*. Generate learning sites and spaces that offer NFE and INFOL services for elderly.

Culture of lifelong learning approach

UNESCO (2020) offers a different approach to LENV support at the institutional level, which emphasizes the process of creating a "culture of lifelong learning". It includes ten macrosocial mechanisms, which are intended to highlight the value and importance of ALE and to expand adult participation in it in a

manner analogous to what we have seen in the case of the work environment learning culture above (see also, Lancaster, 2020; Paine, 2019). According to UNESCO (2020), these are:

1. recognize the holistic character of lifelong learning
2. recognize lifelong learning as a new human right;
3. reengineer and revitalize workplace learning;
4. encourage and support local lifelong learning initiatives including learning cities;
5. recognize and promote collective dimension of learning;
6. transform schools and universities to lifelong learning institutions;
7. ensure access to learning technologies;
8. establish lifelong learning as a common good;
9. place vulnerable groups at the core of the lifelong learning agenda;
10. promote transdisciplinary research and inter-sectoral collaboration for lifelong learning.

All of these measures and their combination are crucial intervening factors that influence whether adults can overcome obstacles for participation in ALE. These measures are especially important in developing countries where adults usually have a lower level of basic skills and where exist fewer opportunities for flexible learning pathways and learning methods. To demonstrate this situation, Owusu-Agyeman et al. (2016) describes ALE policy system in the Nigeria where the participation is driven mainly by industry demands with rigorous learning pathways.

Another approach to foster participation in ALE offers Sandwall (Sandwall, 2010). According to her we should not focus on learning opportunities for adults itself. Rather we should support learners and their self-evaluation ability. We should orient on learning from any kind of everyday practice, not just from a specific working task (in the case of job-oriented learning) and positive meaning making and reflexive practice of experiences. For this goal, she suggests that the role of mentors and coaches is highly relevant. They can operate as facilitators of this process, helping learners with self-evaluation and formulation (Sandwall, 2010, p. 565 ff). This approach should also be based on the counselling services that helps adult to gather relevant information about their learning possibilities, skill gaps, and which help them developed their self-directed skills.

Recognition of qualifications – Integration of formal education, NFE and INFOL

Another effective measure that the states can systematically use to promote participation in ALE is the development of a qualification system for lifelong learning. Legislatively established tools in the form of recognition of prior learning and *recognition of NFE and INFOL outputs* are important elements that contribute to a greater degree of flexibility and permeability of ALE. According to various experts (e.g. Desjardins & Ioannidou, 2020; Singh 2015; Singh & Duvekot, 2013), the countries with the highest participation in ALE and the lowest inequalities in further education are among those that interlink the most systematically all types of qualifications and make use of the transfer between formal education and other types of lifelong learning. As a result, their adult education systems are highly integrated and allow for a high level of transfer qualifications from one field to another.

According to the OECD (2007), the development of an integrated qualification system can deepen cooperation among the state, employers, and individuals, as it is an appropriate coordination tool for their activities - a shared platform or a framework that improves coordination among them. An analysis

of the developed qualification systems in Europe carried out by the OECD (2007) identified several relevant mechanisms that contribute to the involvement of adults in ALE. These are, for example:

1. establishing qualifications frameworks;
2. creating new routes to qualifications;
3. providing credit transfer from different types of education, especially recognizing NFE and INFOL;
4. optimizing stakeholder involvement in the qualifications system;
5. communicating returns to learning for qualification;
6. investing in pedagogical innovation;
7. monitoring the qualifications system;
8. expressing qualifications as learning outcomes;
9. recognizing skills for employability;
10. increasing learner choice in qualifications;
11. clarifying learning pathways;
12. increasing flexibility in learning programs leading to qualifications;
13. lowering cost of qualification;
14. improving information and guidance about qualifications systems;

The UNESCO report (2020) "Embracing a culture of lifelong learning" calls for the creation of a global learning ecosystem that "should fluidly integrate formal, non-formal and informal learning, as well as diverse learning modalities, both online and offline. Such an ecosystem allows for planned or spontaneous individual or collective learning in all spheres, throughout and across the life course" (UNESCO, 2020, p. 9). It is the deeper integration of all three types of lifelong learning that should be one of the key objectives in creating quality LENV for adults at the institutional level. In this regard, there should be a diversification of learning provision, as well as an integration of recognition, validation, and accreditation mechanism of ALE. These measures should promote the holistic nature of lifelong learning in the medium and long terms (UNESCO, 2020, p. 10).

Index of fairness

One of the interesting innovations in the field of ALE policy, which have emerged recently, is the tool for measuring (in)equality in access to ALE – the so-called "Index of Fairness," made and validated by Bulgarian researchers Pepka Boyadjieva and Petya Illeva-Trichkova (2017, 2018). According to them, the positive results that can be achieved through lifelong learning are not so fundamental in comparison to the *structure of the opportunities* that an individual has at their disposal in order to achieve these results. As for equal access to ALE, the states should therefore strive, at the macro-social level, for *equal opportunities for such access*.

According to these researchers, equality of opportunity can be measured not through the absolute participation of adults in further education, as is often the case (see e.g. Eurostat, 2020), but through a comparison of the representation of different social groups that participate in it. In this respect, the representation should always correspond to the internal diversity of the adult population (25 to 64 years) in each country. Then, a combination of several criteria can be used to make a holistic index of fairness: (1) the adult representation by age, (2) the gender, (3) the highest educational attainment, (4) the current socio-economic status, and (5) the social-economic background.

For example, if the proportion of people with a low level of education (ISCED 2 to 3) in ALE is significantly lower than the proportion of people in the population, then there is a significant inequality of educational opportunities for this target group and the adult education system is less fair to them.

Knowing this index, including its internal structure, then makes it possible to optimize the educational policy towards reducing social inequalities in those groups that show the highest level of social inequalities. Due to that the index is an appropriate tool for taking effective measures at both national and regional levels, which will increase the addressability of subsequent policy measures, and thus the inclusiveness of the educational environment for adults. Alternatively, it may be used for defining national campaigns aimed at involving groups most at risk of exclusion.

Creating opportunities for non-work oriented NFE

One of the key functions of lifelong learning is developing an active civil society and forming a critical approach to key social and political issues (UNESCO, 2020). According to many authors (Barros, 2012; Mayo, 2019; Milana, 2012), this function is even more important at a time when ALE has become increasingly neo-liberalized in the last two decades, being focused predominantly on labor market skills and subject to economic rationality.

Some authors (Holford & Mohorčič-Špolar, 2012, 2014; Torres, 2013) therefore emphasize that at the institutional level, the states should not only rely on active employment policy instruments and advocate for the integration of formal, non-formal and informal learning, but they also should give more support to learning opportunities that have nothing to do with the qualification system and CVT.

In this regard, Danny Wildemeersch (2018) recommends the states should promote active citizenship, raise critical awareness and support non-profit organizations as "places/spaces" where people can enjoy "leisure time", learn slowly. Within these educational sites, they should have an opportunity to think together how to cope with community and social challenges and how to improve the quality of social life.

Creating conditions for such LENVs, whether through grants, projects or other forms of indirect support (e.g. tax exemptions, equipment rental or preferential rental of space for the implementation of community education, etc.), is an important tool to support community-oriented NFE and INFOL. These forms of ALE can serve as an inclusive network for people who are no longer involved in the labor market and who can benefit from further education, or they may lead to improved health and quality of life of individuals, as some authors state (Feinstein & Hammond, 2004; Field, 2009).

Building support capacities for vulnerable social groups

A specific approach for creation of high-quality LENV for adults and reduction of educational inequalities is an application of measures aimed at vulnerable groups of adults, such as people with disabilities or migrants. In the case of their support, it is important that educational activities lead to the integration of these social groups into society and strengthen the capacity of adults to continue their education so that they are not only one-sidedly oriented to gain certain narrowly defined knowledge and skills. In this regard, UNESCO (2020) recommends making a focus on vulnerable adult groups the heart of the lifelong learning policy.

In this regard, we can see several examples of good practice. Hongxia Shan (2018; see also Shan & Walter, 2015), for example, describes a way in which the education of migrants can be significantly innovated. The education of these people is often based on external assumptions about their knowledge

and skills. It is seldom associated with detailed knowledge of their skills and focuses on migrants' weaknesses rather than their strengths. In contrast to this strategy, Shan (2018) proposes a system of educational support that works with the redistribution of learning and teaching responsibilities among migrants, educators, various organizations, and employers. Due to this reconfiguration of the educational environment, it is possible to better identify the strengths of migrants and encourage mutual multicultural learning. This approach also envisages a "strength-based" curriculum that regulates learning objectives, contexts and resources based on migrants' knowledge and experience. As a result, this approach leads to a building of the social capital of migrants, increasing their preconditions for further learning and finding areas for their employability in a foreign country.

Sahara Sadik (2018) describes key interventions that can improve the education of non-permanent workers who very often get to the margins of the labor market. According to various researchers (Albert et al., 2010; Kalenda & Kočvarová, 2020; Wozny & Schneider, 2014), employers invest the least in the education and training of this workers because it brings them the least return. According to Sadik (2018), the exclusion of non-permanent workers from ALE can be countered by creating professional support structures for them that prevent their isolation. Support structures can take the form of professional groups that regularly meet physically or virtually, share common problems, and ways to solve them. In connection with this, they serve not only as INFOL places, but also as a sites of mutual emotional support, which allows a higher degree of involvement in educational activities and their sustainability.

GOOD PRACTICE EXAMPLE

In a regard to a development of skills that are needed among contemporary adults, the digital skills are one the most important. For this reason, one of the Erasmus+ project focusing on adult education- Digital skills 4 All (DIGIskills, 2020), is aimed to provide guidance and training for adult educators across Europe on how to use ICT tools and digital methods to better deliver basic skills adult education.

The project is a good example how specialized knowledge on digital skills can be acquired and understand the importance of having digital skills for transferring them to low skilled adults and other vulnerable social groups. In addition to that, it also brings opportunities of intercultural contact, upskilling professional competences and greater social recognition of educational mission by stakeholders.

The main conclusion of the project are: (1) stakeholders included international bodies, adult centres, non-profit organization working with disadvantaged adults should add NFE focusing on ICT to their formal curriculum; (2) local and regional administrative bodies should support adult initiatives in their area, and at large organizations interested in ICT education for their workers. They suppose that they will benefit from the positive outcome achieved, in terms of their replicability and dissemination, improving their visibility and their impact within their own community (DIGIskills, 2020).

Differences in LENV within formal education, NFE and INFOL

Due to the significant digitalization of ALE in the last two decades, the main differences in LENV among different forms of adult further education are beginning to blur rather than deepen. In this respect, we can observe a double conversion, on the one hand the convergence of formal and non-formal education, and on the other hand, the convergence of non-formal and informal learning.

In the case of formal education, there has been an expansion of distant and hybrid forms of education - e.g. flipped classrooms, blended learning, etc. (Merriam & Baugartner, 2020; Rosen & Vanek, 2017). As a result, their organization is becoming increasingly like the characteristics of NFE. After all, one of the key ideas (compare e.g. Istance & Kools, 2013; OECD, 2013; UNESCO, 2020) in the background of the transformation of LENV within the school environment was to bring more flexibility, diversity and orientation towards learners, which were always strong attributes of non-formal education (Knowles, 1975). In other words, it is a partial "*de-formalization*" of formal education.

At the same time, the adults who are allowed to participate in formal education and achieve a formal qualification or its equivalent show a higher motivation to participate in other forms of ALE - i.e. in NFE and INFOL (Lee & Desjardins, 2019). Due to that it is necessary to count with the effect of the transfer of studies from formal education to another career. People who undergo it are more often willing to educate themselves, are better acquainted with offers of education and training, and especially have a better level of functional literacy, which facilitates them the further process of self-education (Hanusek et al. 2015, 2017).

As a product of formation of systems for the *recognition of NFE outputs* in many countries, NFE no longer has a lower prestige and symbolic value than it had before. For this reason, it becomes a full-fledged form of further education, the outputs of which can be supplemented by certificates from the formal education system (Singh 2015; Singh & Duvekot 2013). On the other hand, Desjardins (2020) also critically point out to the possible dangers of such a dual system if NFE certificates are associated with a lower social status or even stigmatization. In such a case, NFE may discourage some adults from participating in it.

The convergence of INFOL and NFE is then based on an effort to further *formalize* and intentionally design *informal adult learning*. This occurs especially in the workplace environment. In order to increase the effectiveness of INFOL in the work environment, companies strive to improve the conditions for mutual social learning and proactively create a learning culture that would result in a higher level of collaborative learning and in the creation of a "community of knowledge/inquiry". For this purpose, they organize both physical spaces (e.g. shared jobs, canteens, and cafeterias for meetings with colleagues and unstructured discussions on problem solving) and virtual spaces (e.g. discussion forums, newsletters, corporate blogs, etc.). At the same time, they implement external networks of resources for individual informal learning and their social sharing in the form of podcasts, instructional videos, blogs, and others, into their educational environments.

Despite these two convergence trends, however, it is still possible to note several differences among the various types of ALE. Their character depends on the specific form of the ALE system in a given country which is determined by: (1) the degree of coordination of adult education and training by the state, including the possibility of convergence of formal and non-formal education - it particularly concerns the degree of innovation in the formal education system and the development of a system for the recognition of qualifications; (2) the 'skill-formation regime' which sets requirements for the updating and development of work skills (Busemeyer, 2015; Busemeyer & Trampusch, 2012). Through these requirements, it influences the intensity of innovation in job-oriented training which is reflected in the depth of convergence of INFOL and NFE in the work environment.

When we move from the macro-social, institutional level to the level of individuals, the differences among all three types of ALE remain very clear, as NFE and INFOL place much higher demands on self-directed and self-regulated skills. At the same time, it has higher demands on the internal motivation of adults and on the acquisition of a 'learner's identity' (Rasmussen, 2018, p. 98) and higher demands on experiencing positive emotions in learning – the feeling of success and satisfaction that help to continue this activity (see, e.g., Clear, 2018).

DISCUSSION, CONCLUSION & LESSONS

Discussion

Fragmentation of the research

How are our results relevant to the ETF's intention to come up with new ways to innovate well-established approaches to ALE? In particular, how should we understand the role that the LENV concept and its innovations have for participation in ALE and for adult learning itself?

First of all, the findings of our review show that the research that had been carried out in this field in the last decade brought some fragmentary and unsystematic answers to the questions asked, rather than producing coherent and clear ideas of how to adapt and develop LENV at the level of individuals and whole communities.

Therefore, the result of our analysis is not a manual of methods describing guaranteed tools on how to improve and develop the environment of adults for their more comfortable and more effective learning. In contrast, we can only offer a set of various ingredients and ways in which LENV and its impact on ALE have been approached and which have proved to be more conclusive.

This result is due to the fragmentation of the existing research when a wide range of phenomena related to LENV for ALE are examined, but these are seldom put in a more general theoretical or methodological framework. As a result, we lack both a unifying definition of LENV and a coherent theoretical and methodological approach that would allow for a more intensive intra-disciplinary as well as inter-disciplinary communication. This is also reflected in the lower rate of knowledge accumulation.

Thanks to this, we can observe various building blocks of LENV for adults, but we cannot see whether all these blocks are of the same size and strength, whether they have a supporting or rather a decorative function, how expensive they are, and whether the building of lifelong learning that is constructed from these stones will not collapse over time due to external circumstances.

If research in this area is to move forward, it must focus more on the integration of research findings within a clearly defined theoretical and methodological approach and begin to systematically address the multi-factor and multi-dimensional effects of various LENV characteristics on ALE. It is not enough to pay attention to one partial feature of LENV; it is necessary to perceive it holistically.

The subject of the research

Another essential feature of the current discourse on innovation in LENV is its predominant orientation towards adults who have achieved a high level of education (ISCED 5 and higher), have a high level of skills and belong to the younger age groups of adults (18 to 35 years). As a result, it provides little information on the impact of the discussed innovations on people with low educational attainment, low skill levels and older age groups of the population (50 and over).

From research cited above (e.g. Boyadjieva & Ilieva-Trichkova, 2017, 2018; Desjardins et al., 2006, 2016) we know that these groups are most often underrepresented in ALE and face the highest level of educational barriers.

We must therefore be careful not to generalize the findings of the previous research on LENV concerning these social groups. In many ways, they will have different educational needs and will require different tools to develop their motivation and support and manners in assessing their learning progress. In other words, LENV, which would support their participation and quality of learning, will have different characteristics and will require a different design.

Future research on LENV for ALE should therefore focus more on examining those social groups that have not yet been at the forefront of interest. It should also pose a question about what kind of adults it focuses on and what is the impact of selected characteristics of LENV on different groups of adults.

The predominant orientation of the current discourse towards young, educated adults then has another catch. It is a strong link to the formal education system, to which most of the examined persons are subject to. This is a typical distortion, which is, for example, characteristic of many kinds research in personality psychology or social psychology, where it is the psychology students who are most often examined (Pink, 2011).

Therefore, from the point of view of the availability of the studied population, researchers in the field of ALE are most often inclined to examine participants in lifelong and distance learning courses at universities. At the same time, the understanding of innovations is very often reduced to the introduction of a particular "innovative" element into this type of teaching (e.g. a new online learning course, new self-evaluation strategies, strengthening collaborative forms of learning, or mentoring in teaching). De facto, this is the "de-formalization" of some aspects of LENV typical of formal adult education.

However, if we are to understand better the impact of LENV on NFE and INFOL, we need to leave the walls of universities, including the virtual ones, and focus more on adult education and learning in their natural environment – leisure time, work settings, a family, etc. Only due to that we will be able to understand how different learning environments (work organizations, home, community, etc.) affect the participation of adults in ALE and enhance their learning or make it difficult for them to learn.

Methodology

From a methodological point of view, it is typical that knowledge about innovations in LENV is very often built on the basis of case studies or small-scale surveys, which significantly *limits the validity and reliability* of the existing *knowledge* and the *possibility of its further generalization*.

The decrease in validity is due to little testing of the impact of LENV on adult learners based on (1) controlled experimental studies to assess the real effect of LENV interventions (the impact of the innovations that are being introduced); (2) representative surveys of the adult population that would exclude the effect of bias due to the intentional selection of respondents.

Reliability is then negatively affected by the fact that the described interventions/innovations are not much replicated in other surveys, either in populations with similar traits or through a comparative methodological design in different social groups (e.g. older adults, low-skilled workers, persons on parental leave, etc.).

Although qualitative research is applied in a given field, it often appears as a complementary research technique or does not have a long-term and systematic character. As a result, it does not show a high degree of saturation of qualitative data. The procedures of ethnography or grounded theory, which is considered in the contemporary social sciences to be a mainstream qualitative research approach, are seldom applied in it (see, e.g., Clarke, 2014).

Therefore, in order to further develop knowledge about LENV for ALE, it is necessary to deepen the methodological quality of research in the field. This is evidenced by the fact that only a minority of studies (10 to 15%) were published in key journals defined by Fejes and Nylander (2015, 2019), such as the *Adult Education Quarterly*, *Studies in Continuing Education*, *International Journal of Lifelong Learning*, or *Journal of Education and Work*.

For this purpose, both experimental studies and long-term qualitative research and wide-ranging representative surveys can be used to a greater extent. Only thanks to their combination, it is possible to increase the validity and reliability of our knowledge about LENV for adults.

The problem of innovations

Another important finding of our analysis regarding the ETF research aim is that little space is devoted to definition of innovations. Although innovations are written about, they are not precisely defined what they mean, or how important a particular innovation is. Apart from the explicit definition of innovations in LENV in reports and texts by the OECD (2013, 2018; see also Istance, 2010; Istance & Kools, 2013), most texts consider innovations to mean inserting one new element into the existing (formal) learning environment in order to increase its inclusiveness and/or effectiveness and quality of learning.

However, such an approach to innovations seems to be somewhat truncated because innovations can have a very broad/diverse conceptions and cannot be understood only as a simple addition of one or two partial elements concerning, for example, resources or the organization of learning. Future adult-oriented innovation research in LENV should therefore focus more on a more detailed conceptualization of innovations, including their different degrees.

Blank spaces

In the existing discourse, a number of not yet thoroughly researched areas related to LENV can be noted. These blank spaces are not only limiting our knowledge, but they also represent opportunities for the development of further empirical knowledge. With this in mind, further research should focus:

1. on *the role of the macro-social environment* in creating high-quality and inclusive LENV for adults, and on studying the implementation of innovations in it (e.g. active employment policy tools and measures, functional and cultural literacy, civic participation and civil society that can increase ALE inclusiveness and contribute to its greater efficiency);
2. on the role of LENV in *informal learning* in and out of the workplace, within the family, local community, cultural institutions, and other physical and virtual environments that adults get into

- and that can significantly affect not only acquired knowledge and skills but also values and attitudes towards lifelong learning;
3. on the issue of *socialization and the physical environment* that in the current research only tend to form implicit components of LENV rather than being its full-fledged, consistently conceptualized and detailed studied components;
 4. on *less represented groups of adults*, especially vulnerable social groups that are most at risk of exclusion from ALE (UNESCO, 2019);
 5. on innovations of the learning environment that *are not primarily based on the application of DOL tools* and from which adults across the population could widely benefit.

Disseminating and combining knowledge in these areas can help us better understand the impact and diversity of LENV on lifelong learning and contribute to formulating more direct forms of support for both its providers and adult learners.

Predominant versus alternative theoretical approaches

A particular problem of the current discourse on innovations in LENV for adults is its predominant theoretical focus, i.e. the dominant theoretical models and concepts that have prevailed for understanding the learning process and the role of the environment in it. In particular, there is a strong *emphasis* on individuals (as the initial unit of analysis) and the issue of *self-directed* and *self-regulated learning* (as key learning processes that should be subject to interventions).

However, the relevance of this theoretical approach has its limitations. First, it does not apply to all target groups of ALE, especially if learners have a limited level of entry skills, and their self-regulation is low. In such a case, adults require a much greater degree of support and guidance not only in their NFE but also in INFOL if it is to lead to a positive transformation of their knowledge and skills.

Second, it does not allow us to monitor in detail *the impact of the environment on the learner*, on the whole learning situation in which the actors are immersed and which is co-formed by interrelationships among individuals (their skills, intentions, attitudes and motivations), learning opportunities, contents and resources of learning, or external support available to them. These elements are not reducible to the external conditions of self-governing actors but form crucial building blocks that constitute and enable the learning process itself.

Future research in this area should therefore also use theoretical approaches other than self-regulated and self-directed learning that would place more emphasis on situational aspects of the learning process, and that would be more compatible with the concept of LENV which has them "genetically encoded" in itself. In this respect, they could be inspired by theories of *situational* (Wenger, 1998, 2018; Lave & Wenger, 2016) or *experiential learning* (Kolb, 1984; Jarvis, 2006) that can be a stimulating counterweight to the current theoretical orientation.

Conclusions

In addition to mapping the current research, one of the aims of this report is to find answers to the key functions and influence of LENV on the involvement of adults in the lifelong learning process and on its resulting quality. In this regard, we can say that the existing discourse emphasize that in order to reduce barriers to adults, increase their participation and achieve a higher degree of fairness of educational opportunities, it is necessary to develop the following elements:

1. monitoring the educational needs and skills of adults, and on their basis optimizing (individualizing) systematically LENV. Only thanks to that, it is possible to offer adults such education that is relevant, meaningful and useful to them and that reflects their initial assumptions;
2. supporting motivation for ALE, before and during the learning process itself in order to maintain its constant level. For this purpose, it is possible to use not only legislative instruments (the system of recognition of qualifications from NFE and INFOL) but also support and counselling at the level of education providers or within the facilitation of INFOL of individuals and groups. A secondary intention in this context is to contribute to the formation of positive emotions associated with lifelong learning.
3. offering educational content that is highly relevant to adults and that at the same time develops transversal skills widely applicable in the knowledge economies of the 21st century; following that, to support the development of these skills and to create and deal with learning resources that contribute to their easy acquisition;
4. integrating lifelong learning systems to allow flexible learning pathways and the transfer of skills from one area to another – e.g. from non-job-oriented education and training to job-oriented education and vice versa;
5. making use of modern technologies, where possible and appropriate for the ALE target groups, to improve the availability and flexibility of NFE and INFOL;
6. supporting employers in financing ALE and making it possible for ALE to be part of daily work practice;
7. implementing measures that will lead to a higher degree of coordination among key ALE actors (state, stakeholders, employers, educational organizations, etc.), supporting non-market/non-economic forms of ALE and groups at risk of exclusion from ALE.

The connection between theory and practice

The results of our report suggest that another critical strategy that needs to be developed is to *link theory and practice* – i.e. in monitoring and examining the influence of LENV on ALE as well on its specific formation and development, which we currently see mainly in the field of job-oriented education in the so-called knowledge services or knowledge professions (OECD, 2019). It is in these fields that the scholars most often mention the introduction of experimental learning methods that change the traditional notion of adult education as an activity that mimics the 20th-century school education (see, e.g., Bersin, 2017; Lancaster, 2020; Paine, 2019; Wheeler, 2019). It can therefore be beneficial for rethinking and defining how we understand LENV and what can be part of it, or how we can understand the very process of further education and its function.

Therefore, in the further development of knowledge on the development of quality LENV for adults, we should address not only the issue of transferring knowledge from theory to practice (generalizing fundamental knowledge for the purposes of learners, educators and lifelong learning institutions) but also the dialogue between researchers and practice representatives. The development of this cooperation could lead to the extension of the LENV sphere, which is currently the focus of research (formal educational environment of higher education institutions), to the area of NFE and INFOL, which are significantly less researched. At the same time, it could result in examining problems and questions about LENV that are relevant to learners and educators in everyday life in the 21st century.

The role of the work environment

As mentioned above, the field of job-oriented ALE is now becoming an essential domain of lifelong learning and its innovations. In many companies and organizations, the place of work has become a centre of further education – in the environment where adults are most often educated, and which can thus make a significant contribution to their further development. The reason for this situation is that INFOL and NFE have become a common/necessary part of the work process in many post-Fordism economies today and go hand in hand with the most suitable environment for supplementing and enriching work-oriented skills. The need for education is topical there, the transfer is immediate, and the usefulness is evident.

Therefore, if there is to be an increase in adult participation in countries with a low level of ALE participation, which also includes most ETF partner countries, companies need to be encouraged to become, to a greater degree, learning places that enable the development of their employees' skills.

However, this recommendation has two Achilles heels. The first one is that there may be significant differences among employers in promoting lifelong learning in the workplace, based on the size of the organization, the development of the corporate learning system and the sector in which the organization operates. Smaller businesses, with less developed learning systems, lower financial and human resources and location in sectors that require routine work and a minimum of innovations, will be much less motivated to support and train their employees. Support and advisory network must therefore be set up for them to get engaged in ALE and there must be a clear political interest that will contribute to the promotion of in-company education as one of the paths to long-term social sustainability through social policy instruments and measures.

The Achilles' second heel is that the work environment is not suitable for all forms of lifelong learning and should not be reduced just to the level of its economic viability and to a tool supporting the employability of the workforce. As a result, the humanizing, civic and emancipatory potential, which is no less important for long-term social sustainability, would disappear from ALE.

The absence of a unifying definition of LENV: threats and opportunities

How fundamental is the problem with the current scientific knowledge that there is no consensus on *how LENV is defined and understood*? We have indicated above that the lack of consensus on this issue makes difficulties in accumulating knowledge about the impact of LENV on ALE. It contributes to reducing the validity and reliability of the existing knowledge, which in turn limits the transferability of knowledge from research to practice.

From the point of view of everyday learning and adult education, this absence is less critical, because for each learning individual, or (learning) organization, only its educational environment (and the way it designs it) is relevant. The approach to LENV in such a case is "pragmatic", not "scholastic", and solving problems is always more important than their defining.

On the other hand, due to such an approach, factors that may intervene in LENV, and are not perceived by actors (unknowingly) as necessary, may not be obvious. For example, they may include the architectural layout of the place of learning, the insufficient cultivation of educational content, the underestimation of the level of input skills, and many other factors the impact of which is often tacit in learning. In such a case, a quality LENV map (in the form of a well-established and shared definition) can also help practitioners and learners to better orient themselves and reflect on what factors they may

have neglected in creating their LENV, or which ones to focus on if they want their learning to have a higher quality and impact.

From the point of view of the constructivist epistemology of science (cf. Fosket, 2015), the absence of a shared definition of LENV can even be approached positively, as its non-existence allows for a number of pluralistic conceptions of LENV and for a number of ways of their developing. The hegemonic conception of LENV is alternated by the heterogeneity of concepts that are equal in their meanings.

As tempting as this approach may be, it will not help us much if our primary goal is to achieve a solid confirmation of the knowledge about the impacts of environmental mechanisms that affect ALE. If we completely stopped searching for such a definition, at least a general one, it could easily happen that the existing research would become even more fragmented, thus completely losing relevance to the transfer to practice, and that each LENV could be considered a "sui generis" phenomenon - an environment "in itself" which is always so original that nothing can be said about it beyond its detailed description.

We believe that a much more effective strategy is to create a general definition of LENV and conduct a dialogue on it. Such a definition can then form one of the partial connections for empirical research in this field and an imaginary bridge between theory and practice.

Challenges for further research and policy in the field of ALE

The LENV innovation knowledge map has proven to have many unexplored places, which brings several other challenges that can be addressed in the coming years. First, the current approach to the definition of LENV and its innovations needs to be critically reflected and thoroughly re-evaluated. Then, it is essential to focus on researching groups that have not been examined so far and to pay more attention to both the specifics of their INFOL environment and the impact of LENV on their education and training. At the same time, the follow-up research should re-evaluate to a greater extent current theoretical orientation and methodological approach and pay more attention to the quality of the chosen research design. In this respect, experimental studies, representative research surveys and long-term qualitative research need to be developed, and efforts should be made to apply a systematic comparative analysis to monitor the impact of different LENVs on the same social groups as well as the impact of identical LENVs on different adult groups. As part of the development of research (its thematic focus) and the improvement of the transfer to practice, it is then appropriate to deepen cooperation with people from practice.

Simultaneously with the development of research, it is necessary to strive for the development of measures at the macro-social level that would be able to support the creation of quality LENV. In this respect, the formation of LENV cannot be left to market regulation alone, as this would further deepen the economizing conception of ALE. In such a case, job-oriented education would eliminate leisure- and civic-oriented forms.

Lessons

Based on the previous discussion and conclusions, we can formulate several key lessons at this point, which are partly based on trends in understanding and studying innovations in LENV and partly on the most factual knowledge about the impact of LENV on ALE.

First, new ways to develop self-directed and self-regulated learning need to be sought, as well as new forms of transversal skills that are necessary to build an individual's agile approach to lifelong learning.

Without their development, it will be much more difficult for a person to fully learn throughout his/her life and use the wide range of learning resources that the 21st-century information society offers.

In this respect, it would be appropriate to strengthen the role of shaping these skills already in the primary and secondary education in order to better prepare individuals for the "career" of a lifelong learning actor; or, in other words, to strengthen the offer of these skills, for example within the NFE. Institutions of interest education can play an important role in this, as they can contribute to the development of specific generic skills and can then be used in job-oriented learning. In such a framework, the NFE can also serve to support the development of generic skills of less-skilled people who, due to the lower level of educational attainment and the nature of their work, do not have many opportunities to develop those skills, which makes them more vulnerable in the case of significant changes in the labour market.

Second, the holistic nature of lifelong learning calls for a holistic policy. This should include not only the building of the legal framework and institutional system to ensure the integration, coordination and support of the NFE (top-down lifelong learning support) but also the developing of a learning culture and recognition of the importance and value of lifelong learning in adult everyday life - e.g. in the form of support for active local initiatives, cultural institutions and communities (bottom-up support for lifelong learning).

Third, the complexity of LENV and the diversity of ALE participants require the search for and testing of diverse ways to intentionally create a high-quality environment at the level of: (1) individuals (INFOL personal environment); (2) organizations and offered training programs and courses (meso-social environment linked to the NFE); and (3) institutions (macro-social support and coordination of ALE actors). In this respect, there is no one perfect LENV that would have positive impacts on all three levels and for all potential ALE participants. LENV must always be created for a specific purpose and for a specific target group. The more specific this group (or individual) is, the more specific the LENV must be.

Fourth, the development of high-quality LENV does not have to be just about adding new elements to it – such as new ways of learning, information resources and learning facilitation – but it may also mean removing some elements from it. It may mean reducing the cognitive burden of an individual during the day, reducing the volume of his/her learning (introducing the so-called micro-learning) or removing information barriers or inappropriate methods of evaluation. The formation of LENV therefore consists not only in supplementing it with new elements but often in reducing them, too.

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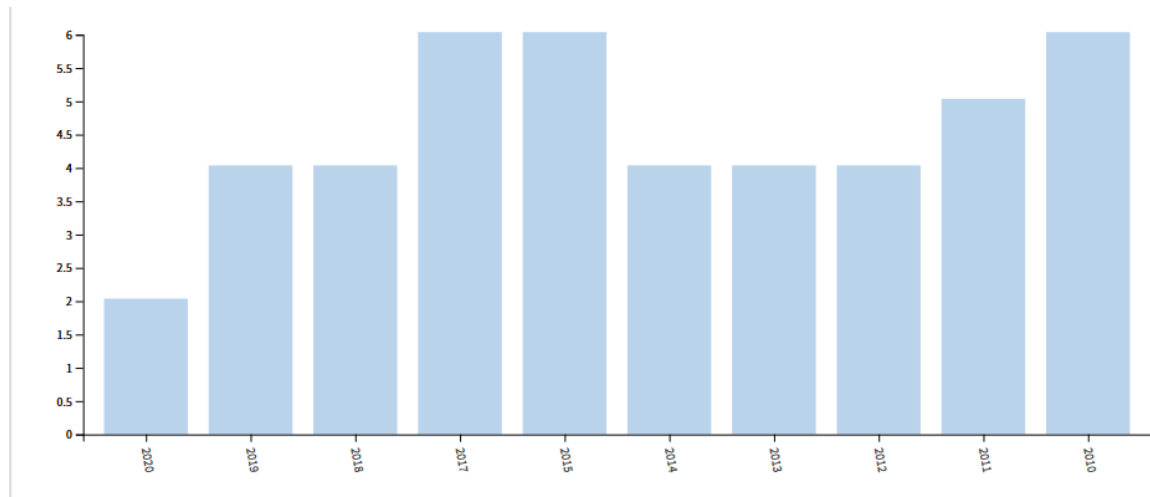
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SUPPLEMENT MATERIAL

Screening analysis (Web of Science)

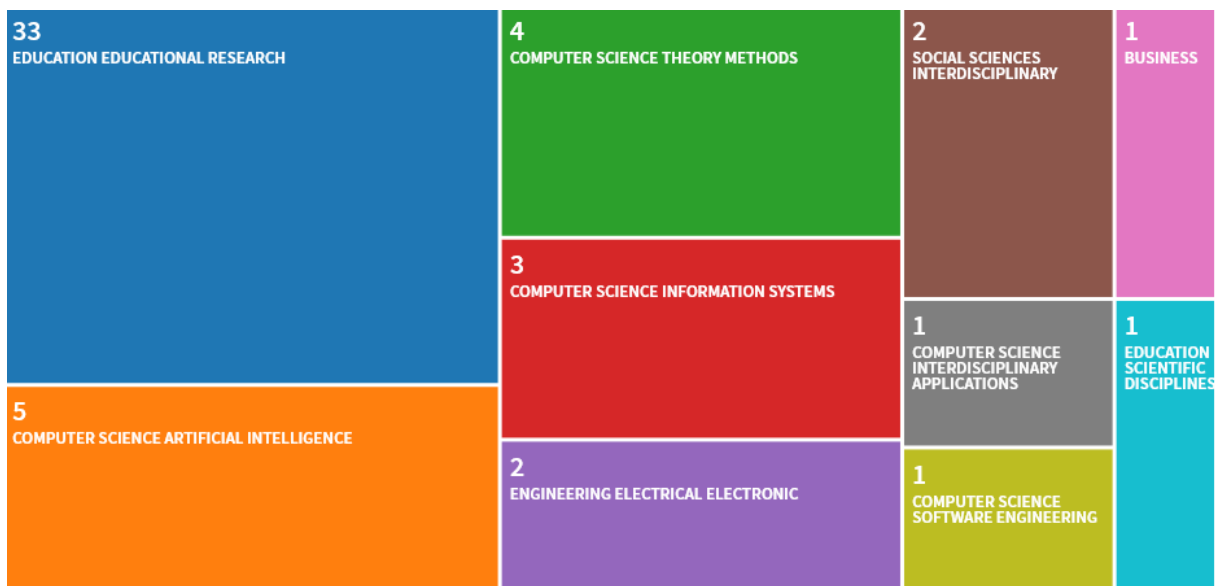
Search terms: “innovative*” AND “learning environment*” OR “learning space” AND “Adult learning*” OR “Adult education*” OR “vocational education and training*” OR “lifelong learning*”. Screening process in titles and abstract of articles for years 2010 to 2020.

SCHEMA 01: RESULTS OF SEARCH BASED PUBLICATION YEARS (SOURCE: WEB OF SCIENCE, CLARIVATE ANALYTICS)



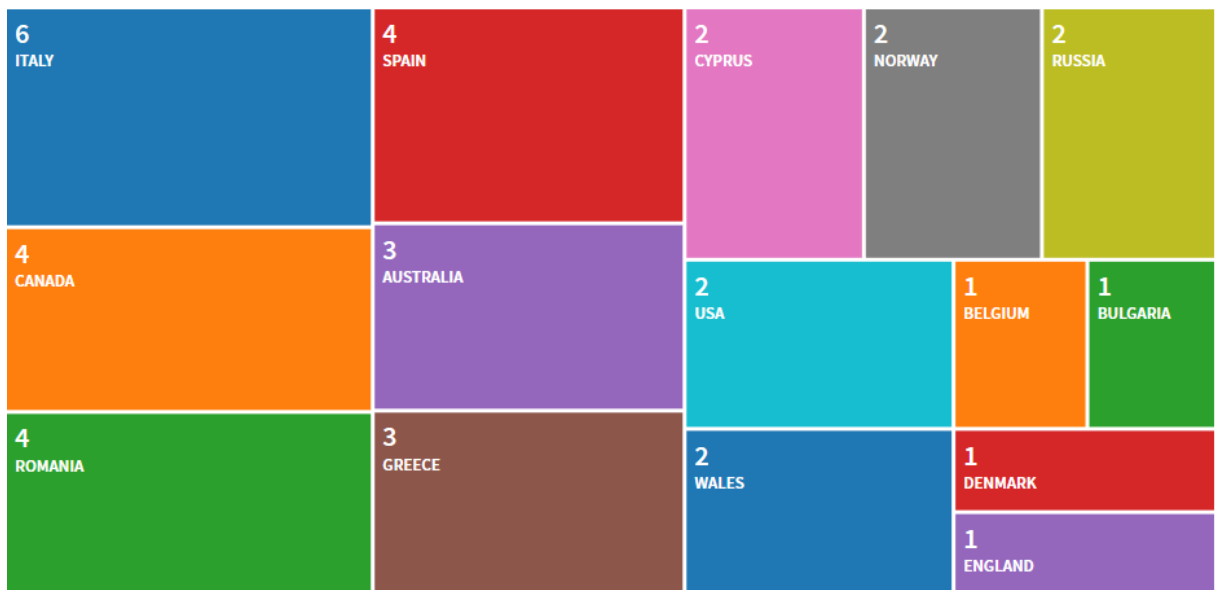
Note: data 2010 to 2020 (total 45 documents)

SCHEMA 02: RESULTS OF SEARCH BASED ON WEB OF SCIENCE CATEGORIES – SUBJECT AREAS (SOURCE: WEB OF SCIENCE, CLARIVATE ANALYTICS)



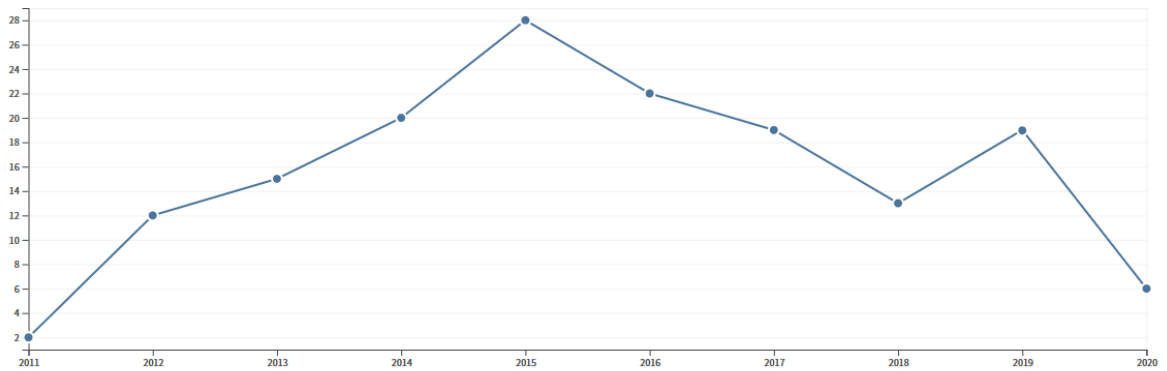
Note: data 2010 to 2020 (total 45 documents)

SCHEMA 03: RESULTS OF SEARCH BASED ON COUNTRIES/REGIONS (SOURCE: WEB OF SCIENCE, CLARIVATE ANALYTICS)



Note: data 2010 to 2020 (total 45 documents)

SCHEMA 04: RESULT OF SEARCH BASED ON SUM OF TIMES CITED PER YEAR (SOURCE: WEB OF SCIENCE, CLARIVATE ANALYTICS)



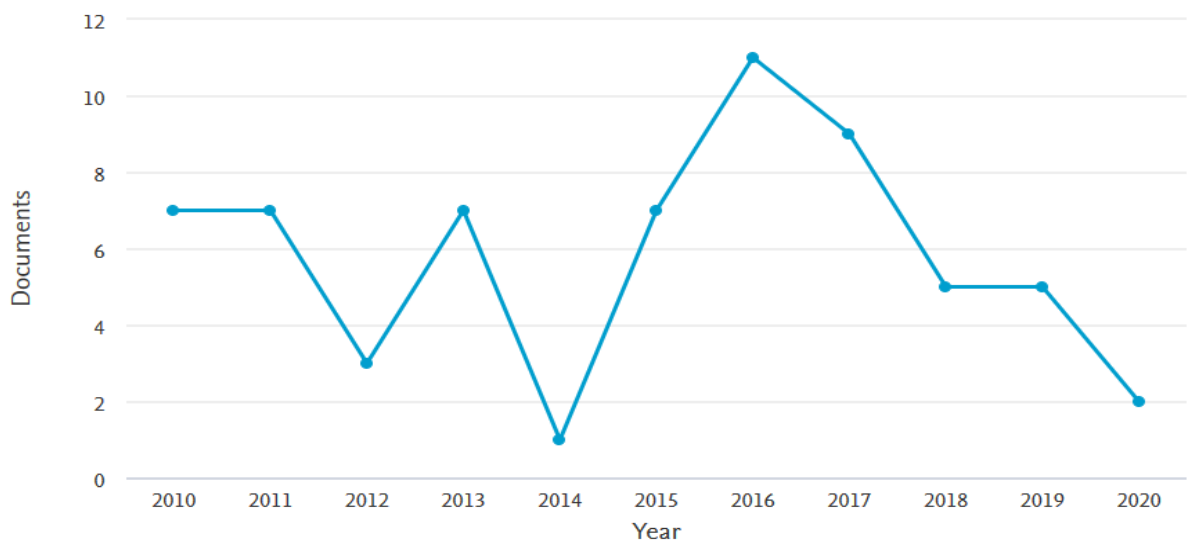
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Screening analysis (Scopus)

Search terms: “innovative*” AND “learning environment*” OR “learning space” AND “Adult learning*” OR “Adult education*” OR “vocational education and training*” OR “lifelong learning*”. Screening process in titles and abstract of articles for years 2010 to 2020.

SCHEMA 05: SCHEMA 01: RESULTS OF SEARCH BASED PUBLICATION YEARS (SOURCE: SCOPUS, ELSEVIER)

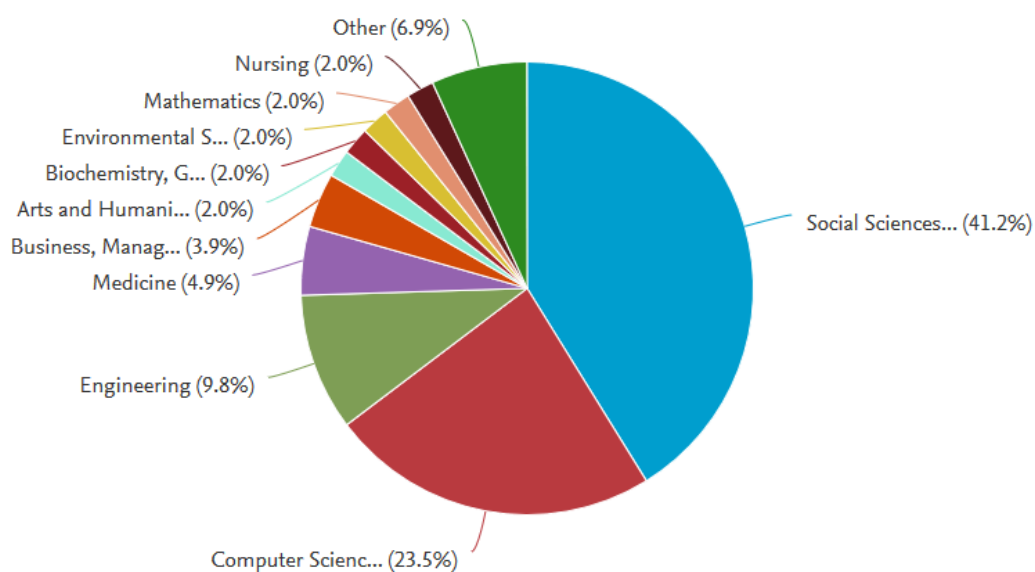
Documents by year



Note: data 2010 to 2020 (total 64 documents)

SCHEMA 06: RESULTS OF SEARCH BASED ON SUBJECT AREA (SOURCE: SCOPUS, ELSEVIER)

Documents by subject area

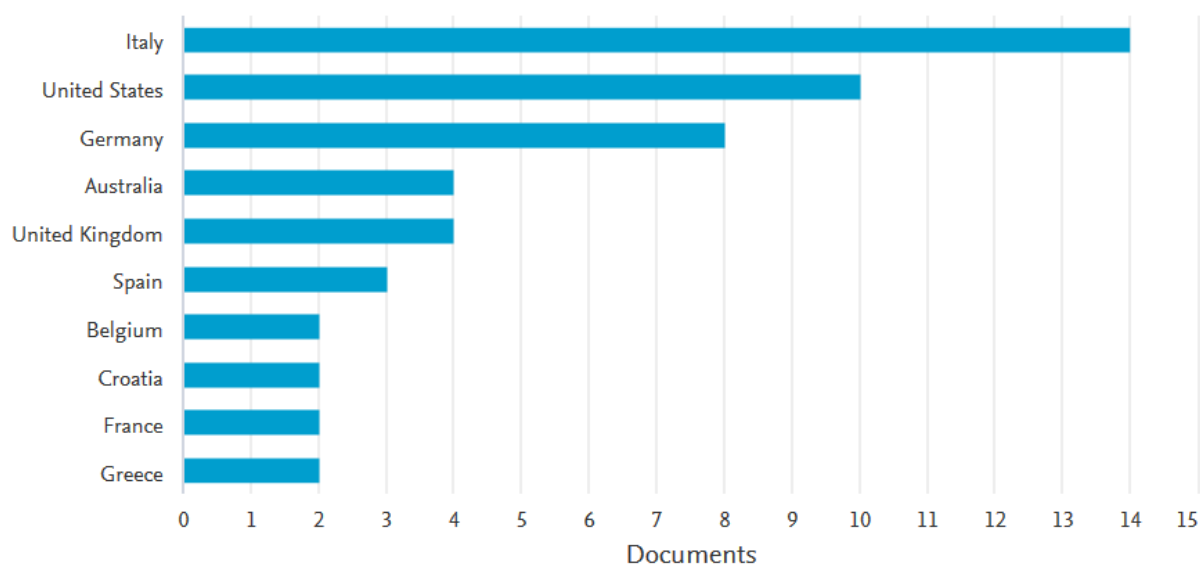


Note: data 2003 to 2020 (total 64 documents)

SCHEMA 07: RESULTS OF SEARCH BASED ON SUBJECT AREA (SOURCE: SCOPUS, ELSEVIER)

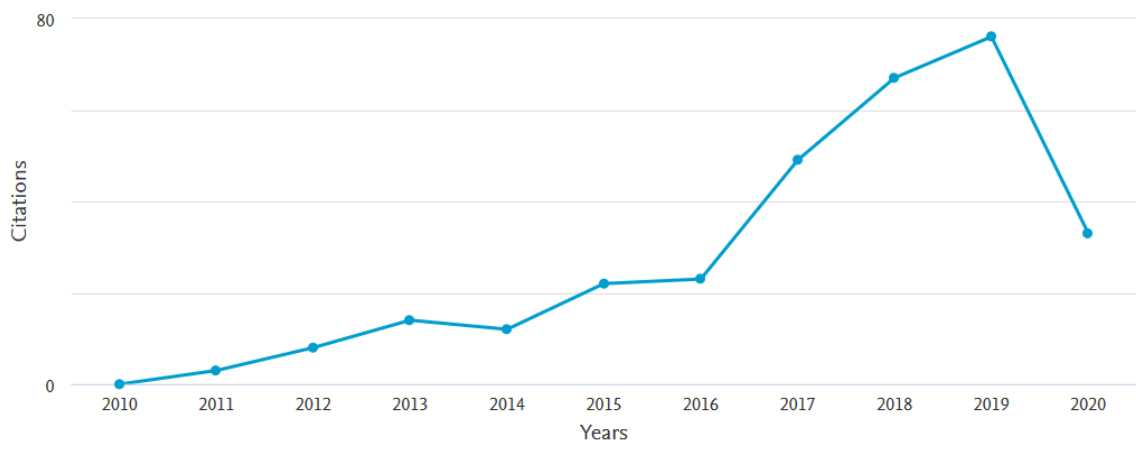
Documents by country or territory

Compare the document counts for up to 15 countries/territories.



Note: data 2003 to 2020 (total 64 documents)

SCHEMA 08: RESULT OF SEARCH BASED ON SUM OF TIMES CITED PER YEAR (SOURCE: SCOPUS, ELSEVIER)



Note: data 2010 to 2020 (total 64 documents, total 307 citation)