Foster employability and fight social exclusion through the development of lifelong learning (LLL) key-competences: reviewing twenty years of LLL policies

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Abstract

Purpose – This study aims to provide an overview of the past two decades of lifelong learning (LLL) policies for enhancing employability and reduce social exclusion in young people of European countries through the development of the so-called LLL key-competences.

Design/methodology/approach – Built on a quasi-systematic review, this contribution explores traditional and new methods for promoting the LLL transition, and then employability, in young adults (e.g. apprenticeship, vocational training, e-learning, etc.).

Findings – It argues the need to identify all the possible approaches able to support policymakers, as they can differently impact key-competence development.

Originality/value – Finally, based on the consolidated EU policy experience, we propose a strategy of implementation of the LLL programmes that facilitates the institutions’ decision processes for policy-making through the use of decisional support system.

Keywords Employability, Decision support system, Lifelong learning, Key-competences

Paper type Literature review

1. Introduction

1.1 Fostering employability through the development of lifelong learning key-competences

A wide range of aspects revolves around employability, a concept used by Hillage and Pollard (1998) to indicate those capabilities necessary to find and retain a job and obtain a new one when needed (Ceschi et al., 2017). Indeed, several factors can impact on employability. First, the context interpreted as the current trends in the market labour but also some individual difference traits, which can have an impact on the individual employability since they have been for a long time assessed for predicting workers’ success at the early stage of their career (Sartori et al., 2016a; Sartori et al., 2016b; Sartori et al., 2017). On the other hand, about employability, great emphasis is usually assigned to the role of competences that can be acquired, developed and transferred in a
constant manner throughout the all stages of life, namely, key-competences for LLL or just key-competences. Key-competences have been associated over the years with several definitions (Elbers, 1991; Mulder, 2007; McClelland, 1973), as affirmed by Velde (2001, p. 1):

[...] there is both a concern about the meaning of competence and how it is interpreted in the workplace, and the demand for competence in the workplace, for different kinds of worker key competence, for more opportunities to become competent, and for it to be sustained and nourished in a lifelong learning way.

Indeed, several attempts have been proposed over the years to define but also distinguish, competences for LLL. For instance, Sloane (2011) suggested distinguishing key-competences between hard and soft skills: while the former set relates to technical competences and it is highly dependent on task, the latter ones identify interpersonal competences that can be applied across different activities and developed across the lifespan. Similarly, Billett (2009) argued that LLL key-competences could be understood from two different points of views: the social and personal perspectives, and to evaluate the worker’s success, both of these perspectives must be considered since these competences comprise a set of knowledge, abilities and attitudes that allow a person to be competent in the workplace, as well as in everyday life (Sartori et al., 2018). In this sense, key-competences correspond to antecedents the concept of employability assets proposed by Hillage and Pollard (1998).

Lifelong learning key-competences are also recognized as factors of innovation, which are strongly linked with training and development processes oriented to foster employability (Sartori et al., 2013). As affirmed by Sartori et al. (2018, p. 2) “these competences are a key concept within the perspective of both lifelong learning and change management”, in which on the one hand, competence-based training paths have been investigated to facilitate the development of employability in specific environments, and on the other hand, they have actually considered the antecedents for building-up LLL processes which does not limit only to the work dimension (Velde, 2001). Indeed, the Recommendation 2006/962/EC of the European Council (European Parliament and Council of the European Union, 2006) on key-competences for LLL identifies eight of them that are considered crucial for individuals in a lifelong knowledge-based society, i.e. communicating in a mother tongue, communicating in a foreign language, mathematical, scientific and technological competence, digital competence, learning to learn, social and civic competences, sense of initiative and entrepreneurship; cultural awareness and expression. The aim of this taxonomy of key-competences is to create a frequent basis for European LLL policies and the exchange of good educational and vocational training practices around Europe. This is also considered a call for educational and vocational systems not only to facilitate employability but also to enhance LLL policies oriented to fight social exclusion, especially among the young population.

1.2 Not only employability, lifelong learning for tackling social exclusion

Lifelong learning is a process through which individuals acquire information, knowledge and competencies in a range of formal and informal settings, throughout life (Sartori and Tacconi, 2017). It may occur as part of schooling, education, training, personal development (Brookfield, 1986) or workplace-based learning (Billett, 2011), and applies to people working in organizations, vocational teachers and trainers included (Mulder et al., 2007; Sartori et al., 2015). Lifelong learning is considered to be an appropriate response to changes (Gibbs et al., 2007) and a key lever for resilience, adaptation and development (Smidt and Sursock, 2011) of both individuals and organizations (Roland, 2010). It has been argued that it can represent the
means by which people go on acquiring such LLL key-competences (Garavan et al., 2002), gain expertise (Jarvis, 2009), adapt to different job market conditions (International Labour Organization, 2000) and develop employability while growing up (Commission of the European Communities, 2007). Lifelong learning represents the cornerstone of the learning society described by Frank Coile (2000, p. 5) “... in which all citizens acquire a high-quality general education, appropriate vocational training and a job [...] while continuing to participate in education and training throughout their lives”. That is, LLL is a theoretical and practical concept that refers to the fact that it is both possible and necessary for human beings to keep on getting information, knowledge and learn those LLL key-competences for professional purposes (Sartori et al., 2018).

On the other hand, professional purposes are not the only outcome of LLL policies; the LLL perspective has also been conceptualized within a political framework, which focuses on the role and the function of knowledge and learning to enhance the cohesion of societies. European policies, in this sense, are intended to support LLL as a factor underlying the development of practical institutional actions aiming at fostering social participation (Lodigiani, 2008). As a result, in many European countries, LLL policies have been developed to improve the integration of young people at the risk of social and work exclusion (Bynner and Parsons, 2002). Lifelong learning policies can be defined, as well as a guide to actions taken by institutions to foster LLL in a manner consistent with local laws and social customs. Their purpose is to disseminate the relevance of LLL in the specific context where young adults live, contextualizing it in accordance with their developable competences and social barriers they face to be included in society.

1.3 Reach out to European young adults at risk of work and social exclusion; the challenge of lifelong learning policies

In light of the above considerations, at the individual level, LLL policies aim to enable young adults to identify and develop those key-competences necessary to find, retain and progress in employment: that is, to improve their employability. In the past two decades, the development of LLL policies resulted in a diversified market configuration for adult education throughout Europe, which is expected to increase further. The continuous acquisition of key-competences is perceived determinant for professional success and career for two main reasons. First, the expected growth of the adult education market has resulted in the need to develop a systematic analysis of education policies linking it to forecasts for the demand of work skills in the future. Secondly, referring to the Strategic objective 1 “Making lifelong learning and mobility a reality” of EU Council (2009/C 119/02), a significant issue related to LLL is the idea of social justice. Limited learning opportunities and the inequitable access to the training system provide a broader social exclusion of many groups of young people (Gorard and Rees, 2002). Success, in this context, is understood as those policies that show the improvement of learning outcomes, particularly those reaching out to young adults at risk of social exclusion and other vulnerable groups.

Following this framework, as well as the EU Council Resolution on a renewed European agenda for LLL adult learning (2011), new policies are going to be developed over the Horizon 2020 programme [1], with the aim to encourage higher education institutions to embrace adult learners as a means of displaying social responsibility and a greater openness towards the community at large. The overarching objective of these new policies is the improvement of the above key-competences related to adult education in general, and young adults and vulnerable groups in particular, focusing on the area of integration between LLL programmes and higher employability. In this context, previous successful policies, both traditional and innovative, that reached out to young adults at risk of work and social
exclusion, have been first identified with the present literature review. Next, we will focus on the outcomes and effects of such policies above briefly presented (i.e. strategic LLL key-competences development, employability, challenging social exclusion). While analyzing why, for which target group, and in which national and regional section these programmes could be successful, by using a new technological decision support system (DSS), will be finally discussed as a possible practical solution applied to the present review.

1.4 Methodology
This article aims to identify LLL policies approaches that can guide the choices of policymakers regarding policies for enhancing the employability in young people and reduce risks of social exclusion. The initial assumption (discussed in the first part of the article) is that the key-competences promote by LLL correspond to antecedents of the concept of employability and to improve LLL policies means enhancing the employability of young adults in Europe to fight phenomena of social exclusion.

The paper is built on a quasi-systematic review of the approaches to LLL policies present in the literature of the last twenty years, and the identified methodology is divided into three phases. Phase 1: longitudinal analysis using semantic search by keywords (e.g. lifelong learning policy; LLL policy; lifelong-learning policy […] present in the following DBs such as Scopus, PubMed, Embase and Psychinfo. The inclusion criteria included all the published articles about lifelong learning policies (years 1998–2018) involving original article written in English with qualitative and quantitative approaches, review literature and mixed-method study. The exclusion criteria included articles by unknown authors, review sections of books, and articles written in a language other than English. This result in 109 articles extracted. Phase 2: Mapping of the analysis results (Peersman, 1996) and selection of the most representative research on LLL policies in European countries based on the following analysis units:
- the orientation of LLL policies and related professional practices;
- criticism of the effects of LLL policies; and
- programmes for the implementation of LLL policies.

After such a review, 87 articles were selected for the assessment of the next phase. Phase 3: Elaboration of the summary map with a focus on the objectives and results of the research. Such a quality assessment was conducted by two reviewers, and it was mainly based on the relevancy and validity of studies. Articles were carefully examined and selected by one of the two authors. Finally, 50 articles were included, and the most important points were extracted and summarized in a table (Table 1). Based on a thematic content analysis, articles were discussed next in a narrative form in line with the research goal.

2. Literature review
2.1 Reviewing twenty years of lifelong learning policies in Europe
Despite the term, LLL has an extensive practice in contexts, and its meaning is often not very clear (Clain, 2016), each country has its own definition and, consequently, its own LLL policies. Although there are some definitions of LLL (TeAchnology, 2010; Evaluate IT, 2004; Tempus, 2002; Idahoe-Campus, 2009), we can consider LLL as training that:

[…] should take place at all stages of the life cycle (from the cradle to the grave) and, in more recent versions, that it should be life-wide; that is embedded in all life contexts from the school to the workplace, the home and the community (Laal, 2011, p. 471).
| Authors – Year | Country | Aim – Method | Discussion – Results | Keywords |
|---------------|---------|--------------|----------------------|----------|
| **Ferrari *et al.* (2018)** | IT      | This research study addresses how access to information and the development of digital skills mitigated aspects of social exclusion and triggered more active participation in the life of the community. The project team observed the process of digitalization as it affected administrators, teachers, parents, and students over four years. Data in the form of structured observations, meeting and interview transcripts, and actual usage rates were collected, categorized, and eventually sorted into three main categories: administrative promotion of inclusion; school investment inequitable access to digital resources; and capacity-building among stakeholders. | Analysis of the data supported the ideas that digital forms of participation are particularly valuable for people at risk of exclusion in communities; consistent with European Union [EU] policies, education and particularly its digital form is a valuable key to civic inclusion; and efforts at educational digitalization must be long-term and intentional to be sustainable. | Inclusive citizenship; school digital district; digital inclusion; Inclusive education; capacity building; lifelong learning |
| **Mystakidis *et al.* (2018)** | GR, FI  | The University of Patras has launched a project for the provision of short, accessible, certified distance life-long learning programmes. The main pillars of this project are Excellence, Specialized Personalized Training at cutting-edge subjects, Quality, Deep Learning and Innovation. The research study was conducted using an online questionnaire and aimed at estimating the level of participants satisfaction using interactive learning methods such as collaborative learning. The formative evaluation process was conducted by external assessors based on context, input, process, product approach. The evaluation instruments were The results of the study suggest that the project led to the rapid provision of e-learning programmes that used successfully active learning methods to achieve high learner satisfaction and address training needs and skills gaps. Evaluation and data analysis from completed e-Learning courses revealed that the University of Patras’ blended quality strategy had an overall positive effect. | e-learning; distance education; blended learning; technology enhanced learning; life-long learning; deep learning |

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| Authors – Year | Country | Aim – Method | Discussion – Results | Keywords |
|---------------|---------|--------------|----------------------|----------|
| Abel et al. (2018) | SE | online questionnaires, structured and semi-structured observation | The article considers the problem of how best to use prior experience to bootstrap LLL, where an agent faces a series of task instances drawn from some task distribution. First, it identifies the initial policy that optimizes expected performance over the distribution of tasks for increasingly complex classes of policy and task distributions. It empirically demonstrates the relative performance of each policy class’ optimal element in a variety of simple task distributions. It then considers value-function initialization methods that preserve PAC guarantees while simultaneously minimizing the learning required in two learning algorithms, yielding MAXQINIT, a practical new method for value-function-based transfer. Empirical and theoretical results show that the practical and simple new method, MAXQINIT, can lower the sample complexity of lifelong learning via value-function-based transfer | Life-long learning; policy transfer; value transfer; life-long reinforcement learning |
| Galanis et al. (2017) | ES | This paper proposes a framework to gather, enhance, organize, evaluate and showcase a user’s informal learning using a social approach to engage the learners to use the system by providing valuable recommendations, contacts and feedback | The paper summaries several guidelines for validating and evaluating informal learning experiences and formalizing their outcomes. This especially, where technology has brought together different cultures and educational systems, managing to keep track of a learner’s competences is a daunting task, and when trying to take into account, the competences acquired through informal means | Informal learning; non-formal learning; e-learning; e-learning; lifelong learning; social learning; validation; evaluation |

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| Authors – Year | Country | Aim – Method | Discussion – Results | Keywords |
|----------------|---------|--------------|----------------------|----------|
| Pilkinton-Pihko and Suviniitty (2017) | FI | Living in learning societies has brought an increased focus to LLL and educational policies that support it. One such policy is the recognition of prior learning (RPL). In Finnish higher education, the most popular procedure for RPL is a test. This raises the question of how well this assessment method serves its purpose. | This analysis shows that the tasks in our RPL test of English differ considerably from those reported in our survey of RPL seekers. This mismatch indicates that we should either adopt an open, divergent assessment method, such as a portfolio or change our undergraduate English curricula to better align them with the working-life communication tasks identified in this study - if a closed, convergent assessment method (such as a test) is preferred. | Life-long learning; educational policies; recognition of prior learning; RPL test |
| Pérez-Escoda, A., et al. (2016) | ES | This essay presents some of the results from a broader research project on the digital competences of primary school teachers and students in Castile and Leon (Spain). The main goal of the study is to evaluate digital competence levels drawing on an earlier study on the specific international assessment of digital literacy and digital skills. | The comprehensive statistical analysis of the results reflects that both teachers and students lack digital skills. This means that teachers cannot make pedagogical use of them so that teacher-training policies in this field should be reconsidered. In students, it reflects the danger of a digital gap that would not be brought about for reasons of use or access but from lack of training. | Digital citizenship; digital competences; teachers; students; education; information and communication technologies |
| Irvine et al. (2016) | NL, AT | Sustainable river basin management depends on knowledge, skills and education. The DANCERS project set out to identify feasible options for achieving education for sustainable water management across the Danube river basin, and its integration with a broader education and economic development. | The DANCERS project identified key short and medium-term needs for education and research to support the progressive adoption of sustainable development, and the necessary dialogue across the public and private sectors to align policies. These include the development of new education networks for masters and PhD programmes, including joint programmes; improved access to technical training and LLL. | Sustainable development; integrated river basin management; skill development; EU policy |

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| Authors – Year | Country | Aim – Method | Discussion – Results | Keywords |
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| Hanemann (2015) | DE | This article discusses recent developments in conceptualizing literacy as a foundation of LLL. The authors of this paper seek to replicate and extend his pioneering work, using data from the National Child Development Study (NCDS), a large-scale survey containing information on all those born in Britain in one week in 1958. Follow-up data were collected at various points in childhood and adulthood, most recently when the cohort reached the age of 50, thus enabling insights into long-term developments. The authors analyze well-being at age 50 as an outcome in structural equation models (SEM). Results suggested a three-dimensional analytical framework which considers literacy as a lifelong and life-wide learning process and as part of LLL systems. The research draws a number of conclusions for policy and practice of literacy as a foundation of LLL. These conclusions are a timely contribution to the ongoing post-2015 education debate. | programmes for skills development; developing formalized and certified competency structures and associated accreditation of institutions | Literacy; lifelong learning; adult learning; post-2015 education agenda |
| Jenkins and Wiggins (2015) | UK | The study presented in this article adopts a life-course approach to participation in learning and the potential benefits of learning. The authors concentrate on adult education in mid-life, that is, between the ages of 33 and 50, as the measure of learning participation. The authors of this paper seek to replicate and extend his pioneering work, using data from the National Child Development Study (NCDS), a large-scale survey containing information on all those born in Britain in one week in 1958. Follow-up data were collected at various points in childhood and adulthood, most recently when the cohort reached the age of 50. | The authors analyze well-being at age 50 as an outcome. This approach helps to understand the pathways through which adult education has an impact on well-being. The estimated models show how adult education in mid-life has an influence on the type and quality of jobs which are accessible to individuals, and how this, in turn, can contribute to higher well-being at age 50. | Adult education; well-being; qualifications; mid-life; SEM |

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| Authors – Year | Country | Aim – Method | Discussion – Results | Keywords |
|---------------|---------|--------------|---------------------|----------|
| Bomba and Zacharová (2014) | SK | age of 50, thus enabling insights into long-term developments | Results show how social and economic changes in Slovakia after 1989 and after the Velvet Revolution had their impacts on education, on redefining the functions of school, on changing the nature of education, school computerization and total modernization but also on the decrease of teachers’ social status and on changing the school funding and long-term underfunding of the Slovak educational system | Higher education; university; blended learning; lifelong learning; neoliberal governmentality; teacher; Slovak education; Slovakia |
| Fonfara et al. (2014) | DE | The task is to learn a dialogue policy that deals with changing user goals, can act under uncertainty, and is easy to apply in practice. Unlike reinforcement learning-based systems, the proposed simulator-free approach avoids common problems such as reward tuning and state-space exploration. Researchers apply imitation learning to mimic an expert’s behaviour based on a small number of Wizard-of-Oz experiments. A dynamic Bayesian Network is used to track hidden user goals | Results show that by using lifelong model updates, it is possible to apply the expert’s policy correctly even if the user behaviour changes over time. However, the executed policies strongly depend on teacher demonstrations, depending on the complexity of the task sufficient teacher demonstrations have to be recorded to cover all situations one wants to consider | Dialog system; imitation learning; lifelong learning; cognitive robotics; bayesian network |
| Sienkiewicz and Trawinska-Konador (2014) | PT | The aim of the paper is the presentation of the development of the polish qualifications framework (PQF) and qualifications system as an example of the implementation of knowledge management in public policy in Poland. As a result of applying the knowledge management approach, the initial proposal of the PQF was enriched and | Results refer to the PQF in the European Qualifications Framework. The publication of the report allowed further sharing of knowledge with a broader spectrum of stakeholders. The subsequent phases of the process included an assessment of the information and knowledge needs to be needed to proceed with the modernization of | Qualifications framework; knowledge management in public policy; lifelong learning; human capital |
| Authors – Year | Country | Aim – Method | Discussion – Results | Keywords |
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| Thelen et al. (2012) | DE | enabled a proposal to be elaborated for the modernization and integration of the qualifications system in Poland that allows for integration and permeability between specific qualifications subsystems as a part of the reform of lifelong learning policy in Poland | the qualifications system in Poland, to close the knowledge management cycle | E-learning; microtraining; semantic-based knowledge platform; demographic change; low skilled ageing workers |
| Thiriet et al. (2012) | FR | The study presents a platform named RELOAD based on so-called Microtrainings and the usage of a semantic net. Thereby, they are individual, self-directed and continuous learning processes | The article suggests that to cope with the demographic change and to face the shortage of skilled workers, the employability of ageing workers has to be secured through demographic-sensitive learning offers. Striking and alerting in this context is that the participation rate of low-skilled and ageing workers in further education lags behind other groups of learners, and nearly no learning offers to exist which are directly targeted to this group and their special learning needs | Lifelong learning; recognition; mobility Of students; harmonization; RPL; accreditation |
| Yankova et al. (2012) | BG | The main goal of this research is to systematize the achievements in the implementation of projects and initiatives of | The paper explores the role and contribution of the Bulgarian library associations in the development of | Library association; LIS higher education; lifelong learning; state university of |
Kalman (2012) HU | The paper presents a research study launched in 2008 that was part of the call for proposals “Training of competences that establish LLL in the non-formal and informal learning dimension”. The survey aimed to examine the will of the adult population to learn after completing formal studies. The methodology of the research relies on methods of analysis and the devices of the empirical study, implement the pilot studies, analyze the results and the observations of the study, elaborate the development proposals and the recommendations concerning the support priorities. The paper investigates the impact of the library organizations’ activities on the theoretical fields of library and information science and education and also on library practice. Research methods: retrospective and systematic analysis, desk research and critical analysis of the results. Results show how learning during adulthood is considered by most respondents to be essential for the work, lifestyle and general human behaviour that drives people to solve new challenges in the natural and social context. The personal motivation of adult education can be determined by a multitude of factors. One of the most important resources for continuous learning is learning and the methodological culture of learning promotion. Keywords: Informal – nonformal – formal learning; lifelong learning; adult education.

Witt and Lill (2011) EE | This paper describes a study of learner perceptions of construction industry skills requirements in Estonia. Results suggest that at the policy level, a simple, elegant vision of integration and mutual dependence between learners, industry and higher education institutions is prescribed. When investigated in more detail, the current dependencies are found to be completely different from the envisioned approach. Keywords: Lifelong learning; engineering education; learner models; construction industry; Estonia.

**Table 1. Reviewing twenty years of LLL policies** (continued)
Pacheco (2011) PT  
Drawing upon the concept of “sliding signifiers” as having a multiplicity of meanings in a given context according to its actors and contexts, this paper explores globalization which does not mean homogeneity and uniformity. The paper examines these meanings by discussing the diverse points of view based upon existing educational and training policies, within the framework of the world agencies. The paper includes, in the first section, an integrated approach of the concepts of curriculum, LLL and evaluation and, in the second section, the discussion of each of these concepts implies the discussion of their meanings taking into account different ways of looking at them, especially in a field which is marked by a disciplinary view. This does not mean the general acceptance of uniformity and the rejection of diversity, particularly when curriculum, learning and evaluation are discussed taking a personal stance.

Results show how reflecting upon curriculum, LLL and evaluation as themes related to education and training policies imply the discussion of their meanings taking into account different ways of looking at them, especially in a field which is marked by a disciplinary view. This does not mean the general acceptance of uniformity and the rejection of diversity, particularly when curriculum, learning and evaluation are discussed taking a personal stance.

Keywords: Educational policies; training policies; globalization; life-long learning; evaluation; curriculum.

Farrow (2011) UK  
A taxonomy of ethical questions based on dominant positions in metaethical moral theory is proposed. The author explains how this taxonomy can be applied in a way that facilitates the understanding of ethical issues in mobile learning.

In this article, the author discusses some of the ethical issues related to the use of mobile technologies in education. He argues that the frameworks used by educators and technologists fail to grasp the nature, scope and impact of ethical issues in mobile learning. This approach is intended to enhance (rather than replace) reflection on ethical issues and support those involved with mobile learning by helping them to think about ethics in a systematic way.

Keywords: Mobile learning; policy; education; metaethics; methodology.

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| Authors – Country Year | Aim – Method | Discussion – Results | Keywords |
|-------------------------|-------------|----------------------|----------|
| Aurora-Nicoleta *et al.* (2010) | RO | The purpose of the article is to present the main objectives and actions taken by the Romanian Institute of Education Sciences as national support services for e-Twinning in collaboration with the Center for Innovation in Education. At the same time, the authors mention the most important campaigns/projects developed within the programme in pre-university institutions in Romania | Results emphasize the benefits of co-working in such projects using the tools of the eTwinning platform. Approximately, 70,000 schools from 32 states are part of the system and they are involved in over 5,000 ongoing projects. Some of the approximately 850 projects carried out so far enjoyed international recognition, schools in Romania were among the finalists/winners or receiving either annual eTwinning prizes or European Quality Certifications from the Central Support Services of e-Twinning in Brussels | Etwinning; information technologies; lifelong learning |
| Hanson *et al.* (2010) | SE | The objective is to present the foundation for and the goals with a LLL project. Nine universities in EU will collaborate around four themes to increase the attractiveness of Engineering Education. The areas are: The attractiveness of being an engineer Formal hinders Attracting students to studies in science and technology/engineering education Student retention Result from the TREE – Teaching and Research in Engineering in Europe Socrates Thematic Network project, the TechBARO in Finland and the Technology Delegation project in Sweden has given inspiration in setting up the foundation for ATTRACT project together with other international initiatives | This paper discusses some aspects of the attractiveness of engineering and technology studies to be monitored by ATTRACT project the Enhance the Attractiveness of Studies in Science and Technology, ATTRACT, the project is within the EU a LLL Programme. The strength of the project is that it will be able to go in-depth into the practices of the partner universities | Engineering education; student recruitment; student retention; attractiveness of engineering studies |
| Poulková and Šimonová (2010) | CZ | Teams were established dealing with the process of e-learning implementation in the tertiary education, at the beginning being | In 2009 a research “Evaluation of the modern technologies contributing towards forming and development university e-learning activities; e-learning implementation; tertiary education |

(continued)
very informal, joining enthusiasts, and their activities were hardly supported. Pioneering e-learning activities in this period were usually financed from various, mostly European projects. Despite the starting troubles the awareness of possibilities provided by e-learning was spreading slowly but steadily. Nowadays there exist university departments specialized in e-learning and its implementation into the process of instruction. There was also established a system for funding e-learning activities, so it does not depend on the random effort of single employees any more.

**Widmark and Koroma (2009)**

The purpose of the steps for skills was to improve the internal quality of health and social care. This was to be achieved by developing the skills of the staff working close to older people. This learning project for LLL has been developed in the last ten years at the Teacher Education unit of the University of Stockholm. The same design but with different contents was used to increase the competence of different target groups; field teachers, policemen, medical staff, principals, etc.

Results rely on the learning project for the course “Steps for Skills” which was a government, a multi-year national initiative to support the long-term quality of municipalities and development of skills in health and social care for older people. Researchers designed courses to carry out the learning activities on three levels: an individual level; an interactive level; a practical activity level. The three levels for learning have markedly contributed to an analysis of the geriatric care’s activity and to development and renewal.

Discussion argued that it is necessary to follow the epithet “emotional literacy” very closely as a process of education for the production of discourses on emotion, rather than the discovery or recognition of certain paradigms.

**Burman (2009)**

The article’s author cautions against subscription to emerging cultural discourses promoting the validity and expression of emotions distinguishing between a feminist agenda and students’ competences’ focusing on e-learning implementation at Czech universities started, being supported by the Czech Science Foundation. There are 26 public universities accredited in the Czech Republic. Annual reports of these universities were the main source of information for this research. These trends have step by step resulted in both quantitative increase in ICT implementation and related activities in tertiary education and in a substantial shift in the quality of formal and informal view on e-Learning.

Discussion – Results | Keywords
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Discussion argued that it is necessary to follow the epithet “emotional literacy” very closely as a process of education for the production of discourses on emotion, rather than the discovery or recognition of certain paradigms | (continued)
| Authors - Year | Country | Aim - Method | Discussion - Results | Keywords |
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| Wheeler and Yeats (2009) | UK | To investigate implementation of e-Portfolios, an explanatory case study on their use was carried out, initially focusing on three groups of students engaged in work-based learning and professional practice. The three groups had e-Portfolios embedded and assessed at different levels. Group 1 did not have the e-Portfolio embedded into their curriculum nor was the e-Portfolio assessed. Group 2 had the e-Portfolio embedded into the curriculum and formatively assessed. Group 3 also had the e-Portfolio embedded into the curriculum and were summatively assessed | Results show how the use of e-portfolios also promotes inclusivity in learning as it provides students with the opportunity to articulate their aspirations and take the first steps along the pathway of LLL. However, ensuring the uptake of opportunities within their learning is more complex than the students simply having access to the software. Results also suggest that the use of e-Portfolios needs to be integral to curriculum design in modules rather than used as an additional tool. In addition to this more user engagement was found in Group 2 where the e-Portfolio was formatively assessed only | Lifelong learning; e-portfolio; e-learning; curriculum design; summative assessment; Formative assessment |
| Greener (2009) | UK | This paper will explore the concepts and behaviours implied in the role-modelling of effective e-learning in the classroom, drawing on data from teachers and learners involved in using VLEs and other Web resources in face-to-face sessions. A study of Higher Education teachers in the UK | Discussion focuses on online and mixed learning which become familiar aspects of the university landscape; pedagogical discussions receive higher priority and ideas on how students can be enabled to learn the appropriate skills for employability and LLL, as well as the | Role modelling; social learning theory; teaching methods; conceptions of teaching |

(continued)
| Authors – Year | Country | Aim – Method | Discussion – Results | Keywords |
|---------------|---------|--------------|-----------------------|----------|
| proposed a shift in their role and behaviour concomitant with the explosion of VLE usage in universities (Greener, 2008) | FI | This paper presents principles taken from literature on old age education based on cognitive ageing (compensating and supporting the deficiencies and strengths) not forgetting the impact of empowerment by current ICTs in the life of elderly people. The experience gained from directing a computer club for the elderly is demonstrated, based on a WWW questionnaire, as well as observations made during years 2007–2008 in Pieksämäki, Finland | Results show how LLL as an individual activity that spans over one’s life is not a reality yet. Especially the elderly, those over 65 years, are in danger of lagging; the solid trust in one’s activity and learning skills is required; besides, many aged today, lack the learning culture (Tikkanen, 2003). Moreover, results show that the continuing education programme for the elderly is strongly facilitated by peer-support which is experienced during informal club-based activities, as well as having a jointly planned content, which is tailored to their needs, motivation and ability | Lifelong learning; elderly people; cognitive learning; ICT and elderly; computer clubs |
| Naumanen and Tukiainen (2010) | GR | This paper aims to identify the needs for LLL of Greek engineers, based on recent survey data publicly available by the Technical Chamber of Greece. This approach, as well as the experience gained from other actions carried out by TElG (i.e. the establishment of a unit for lifelong learning, the organization of summer schools in hot areas of engineering, workshops offered to the academic | Discussion presents how the shortage of highly qualified engineers in our knowledge-based economy requires the collaborative and coordinated action of academic institutions, professional societies, industry players, and education policymakers. In particular, LLL of engineers is considered as one of the most important presumptions for future growth and social welfare | Engineering education; consumer electronics; knowledge engineering; educational institutions; electrical products industry; continuing education; design engineering; power engineering and energy; Educational technology; collaboration |

(continued)
| Authors – Year | Country | Aim – Method | Discussion – Results | Keywords |
|----------------|---------|--------------|----------------------|----------|
| Dondi and Moretti (2007) | IT | This paper presents a methodological proposal elaborated in the framework of two European projects dealing with game-based learning, both of which have focused on “quality” aspects to create suitable tools that support European educators, practitioners and lifelong learners in selecting and assessing learning games for use in teaching and learning processes. | Results from both the projects Uni-Game (Game-Based Learning for Universities and LLL) and Sig-Glue (Special Interest Group for Game-Based Learning in Universities and LLL) are discussed. Both have involved organizations from different European countries, backgrounds and expertise, and as a result of this work, a ‘classification of games by learning purposes’ and an ‘evaluation framework for assessing games’ have been designed and placed at the disposal of European educators, practitioners and lifelong learners. | Foreign countries; learning processes; lifelong learning; instructional materials; educational games; instructional material evaluation; media selection |
| Linkaityte et al. (2006) | LT | The authors of this article aim to develop the theoretical conditions for modelling the activities of adult educators in the LLL. The document is based on theoretical literature and European and national policy documents on adult education and LLL, including observations derived from the personal experience of AduEdu partners from eight European countries. The roles and functions of adult educators are explored and a model is proposed for the design of the activity system for adult educators. | The paper summarizes findings from the SOCRATES Grundvig I project AduEdu – “Qualifications of Adult Educator in Knowledge Society”. The novelty of this model is its description of the activity of adult educator on five levels: national, regional, institutional, interpersonal and individual. | Adult education; framework of qualifications; lifelong learning |
| Kavarakos (2006) | GR | This paper aims at understanding a methodological frame of certification for professional qualifications acquired via informal learning. A operational research | Discussion presents how RDAs are some of the most proper organizations to provide certificated training programmes using new technologies customized for each employee. | Certification; qualifications; unemployment; government; business; Continuing professional development; |

Table 1. Reviewing twenty years of LLL policies.
| Authors – Year | Country | Aim – Method | Discussion – Results | Keywords |
|---------------|---------|--------------|----------------------|----------|
| Lenssen et al. (2006) | PT | (OR) based model was made as a tool for Regional Development Agencies (RDAs) that consists of tests, evaluations and tutoring. The candidate evaluation takes into account the formal qualifications required by legislation includes the skills and the relevant professional experience but also relates to qualifications from his attendance of professional training seminars | or businessman or an unemployed citizen and their local needs. RDAs have the advantage to combine funds from the European Union, the national or the local government and demand a very small amount from the individual persons that come to be served | collaboration; vocational training; testing; legislation |
| Kourtoumi (2006) | GR | This paper aims to investigate the interaction between the sustainability of the European social model and the European Union’s revised Lisbon Strategy and its focus on jobs and growth. The success of this strategy – following its five-year mid-term review in 2005 – depends on attempts to renew European competitiveness through, for example, innovation and LLL and well-designed reforms of the European social model | Findings show how the sustainability of the European social model depends on the success of the overall strategy for growth and jobs, in which innovation and LLL are key. The concrete solutions to achieve a successful combination of those factors in each member state need to be found by the countries themselves. That is why the preparation and implementation of Europe-wide National Reform Programmes for growth and jobs open an opportunity to drive competitiveness which should not be missed | Competitive strategy; European union; European union information; social structure; lifelong learning; innovation |
| | | The first section of the paper discusses the concepts supporting digital collections by networking and integrating collections of digitized archival resources to create new services and infrastructures. The second part of the paper analyses from the educational perspective of LLL important social benefits, both quantitatively and qualitatively, of developing new | Results show how archives have a key role to play in underpinning learning in its broadest sense, both as a formal activity within an institution and informally within the community. This is becoming especially important in an increasingly KM-based environment where communities can look to archives for support and guidance in accessing content information | Life-long learning; social policy; digital collections; archival resources |

Table 1. (continued)
| Authors – Year | Country | Aim – Method | Discussion – Results | Keywords |
|---------------|---------|--------------|----------------------|----------|
| Anastasiades (2005) | GR | infrastructures for accessing and using archival resources | This paper intends to introduce the idea and content of educational digital divide, concerning the key actions of European Union policies on the confrontation of this social phenomenon | Web-based education; educational digital divide; European union policies; life-long learning |
| Whitley and Westwood (2005) | UK | This paper examines the steps taken towards realizing Wolverhampton Local Education Authority’s (LEA) vision for a 21st century “Learning City” – placing all learners at the heart of the system. An outline is provided of the LEA’s journey – aiming at personalized learning, from vision to reality for a city of 40,000+ learners | This paper reflects on the progress made by the City of Wolverhampton in trying to bring together all of the key elements currently recognized as being needed to enable 21st learning. It describes how one UK City has moved from a vision for e-learning to reality in the space of four years. The paper also looks beyond current developments to respond to the needs of learners as they engage in this technology-rich environment | E-learning; learners; technology; personalized learning |
| Sonyel (2004) | CY | This qualitative study unravels teachers’ perception of involvement in LLL through literature review. It also attempts to foster and encourage LLL through professionalism and as the twenty-first century is approaching, learning throughout | The findings suggest that lifelong learning is significant as the nature of teaching demands teachers to be engaged in continuing career-long professional development and additionally, they are the schools’ greatest asset to deliver knowledge. | Educational institutions; government; rhythm; education; educational programmes; instruments; economic forecasting; ethics; books; professional activities |

Table 1. Reviewing twenty years of LLL policies
The findings of this study also indicate that lifelong learning is significant for educators and can be summed up under three main headings as: to develop themselves as professionals; learning throughout life will be essential for adapting to the evolving requirements of the labour market and for better mastery of the changing time-frames and rhythms; and the view of lifelong learning can be attached to individual and social development.

Mihnev and Nikolov (2004) BG The document conceptualizes the experiences of the Center of Information Society Technologies, Sofia University, Bulgaria, in satisfying the learning and training needs of non-university publics who fall into situations that can be defined as determined by LLL. In developing this conceptualization the authors use research results and political agendas in two distinct areas: LLL and higher education systems. As a result of three streams of thought and practice, they outline an "interface" model of an interdisciplinary university structure, which aims to explicitly satisfy LLL market demands.

Rosvik (2003) NO This paper presents a case study of a Norwegian primary school as an example of the approach used to introduce ICT policy in Norway. This paper presents a programme of a lower primary school (6 to 10 year-olds), which has taken up the challenge of focusing on learning to learn, including the use of ICT. After an overview of Norwegian school system and national goals for ICT in education, the paper describes the challenges teachers and schools face when implementing curricula designed to fulfil different national expectations, ranging from specific skills and pieces of knowledge to more general goals such as preparing students for the future society. The most important actor in the Norwegian classroom is the student while the teacher creates stimulating learning environments.
| Authors – Year | Country | Aim – Method | Discussion – Results | Keywords |
|----------------|---------|--------------|----------------------|----------|
| **Breiter (2003) DE** | | | Learning to learn and LLL are considered the main tasks of schools Results show that the so-called 'digital divide' seems to be a major social obstacle for the Information Society. Most experts agree that citizens will need competencies that go beyond the basic cultural skills. The idea of LLL illustrates a major problem of educational institutions: they work separately, they only process the results of the preceding phase and there is a lack of interconnection | Digital divide; equity; lifelong learning/education; partnership |
| **Hylén (2001) SE** | | | The objectives were to find synergies between national initiatives, to promote the use of ICT in education and to facilitate cooperation between schools in Europe. Now the time has come to ask not only what ICT can do for schools but also what ICT does to schools? How does the influence of ICT on society change the role of the school and the teacher? To help to transform the second scenario into reality, the European Schoolnet must in the coming year focus its attention on four areas: collaboration, communities, content and commerce | Communications; innovation; networks; policy |

(continued)

Table 1.
| Authors – Year | Country | Aim – Method | Discussion – Results | Keywords |
|----------------|---------|--------------|----------------------|----------|
| Jenkins et al. (2001) | UK | teacher to become a guide to learning in schools and companies; This article takes into consideration the long-term effect of a degree in graduate lives. Following a degree programme that has used active learning methods within a modular course for over 20 years, researchers provide a prototype to evaluate lifelong learning generated by modern teaching methods | While agreeing with other researchers that there are common benefits from a degree, they also conclude that there is a huge variation in the long-term effects of a course on a relatively homogeneous group of students. The variation derives from four main sources: background of individual students; different reconstructions of the same academic experience; the different personal circumstances during college; and the effects of individual careers after graduation (which in turn leads to further individual reconstructions) | Life-long learning; degree; graduate lives; active learning methods; modern teaching methods |
| Carr (1999) | UK | The paper discusses a solution for developing multimedia management courseware in the higher and further education sectors, which can then be transferred to SMEs to meet their training needs | Twenty interviews with key SME training informants reveal that a simple transfer of material is unlikely to prove adequate; the peculiarities of the SME learning environment represent a major challenge to the design and delivery of effective multimedia management training for this sector. The proposed benefits of multimedia courseware for SME training are the removal of existing training barriers: time, cover, purchasing power, socializing multimedia, ICT skills, negative attitudes, Generic versus Bespoke Training | Courseware delivery; life-long learning; multimedia management courseware; small and medium-sized enterprises |

Table 1. (continued)
| Authors – Year | Country | Aim – Method | Discussion – Results | Keywords |
|---------------|---------|--------------|----------------------|----------|
| Rinne (1998)  | FI      | This article presents sociologically and historically oriented reconceptualizations of the changing relationship between labour and learning in the reflexive modern era. It claims that the whole modern division of labour does not merely reveal the nature by which we define morality but also it is a crucial condition for the whole solidarity of humankind | The article comes to the conclusion that the first modern period, and the Keynesian welfare state policy with its homogenous workforce and policies of full employment, has come to its historical end. The author sees that education has always been seen as a major component in the great Enlightenment project, which has been connected and incorporated by the national state. LLL, on the contrary, has been less incorporated, less an early modern, but more a marginal and informal position, waving the flag for both individuals and groups from below | Labour society; learning society; life-long learning; educational system |

Table 1. Reviewing twenty years of LLL policies
The idea of LLL first appeared in the 1970s, to promote social equality. At first, within a humanistic tradition, the first LLL policies were advocated as a model for developing a better society and quality of life that would allow people to adapt better to changes. Shifting from an idealistic to a pragmatical perspective, starting from the 1980s a climate featured by young unemployment, declining productivity and increasing public deficits, raised in Europe (Rubenson, 2006). In such times, LLL policies became a solution for those dissatisfied with their employment to enhance employability levels. Towards the end of the 1990s, a new set of transitions and adjustment challenges for society, industry and individuals happened. Increased exclusion of large segments of the population, especially of young adults, exacerbated socio-economic divisions and seen as a threat to Europe cohesion as such. Moreover, while there was an understanding that adult education in itself does not serve to create jobs, LLL was addressed to promote those life learning key-competences for adapting to new social and economic life. Such a policy evolution is linked to the research stream developed to evaluate the social impact of such policies and resumed in the review presented in Table 1.

In the review-table is possible to observe the above historical evolution of the LLL policies oriented to different outcomes (i.e. employability, social exclusion, development of strategic competencies). This progress is in line with a different target of the population. While that at the end 1990s LLL were thought as a way for helping older people to be updated with the last digital revolution (i.e. the spread of internet and of personal computers), nowadays LLL policies focus more on the young adult situation: namely, they are more oriented to avoid social exclusion by developing strategic LLL competencies instead of just technological skills. This change in LLL policies over time also affects the several methodologies used for delivering such policies. Indeed, lifelong learning policies are comprised between traditional and new methods programmes, very diverse and fragmented. Probably the most established LLL way of job inclusion among the EU member states is represented by apprenticeship and vocational practices, which will be next introduced together with other new learning methods-based communication technology (ICT) as a mean to educate participants, such as the Massive Open Online Courses (MOOCs).

Beyond conceptual and methodological differences, it is possible to observe a convergence point among the different LLL programmes: avoiding social exclusion through participation in the job market by enhancing self-employability. On the other hand, such institutional action has also been developed to face current criticisms regarding the supply of adult education in many European countries defined as inadequate because it often fails to include the most vulnerable groups such as the young, the unemployed, the low skilled (Jarvis, 2004). Recent criticisms on LLL policies’ effects will be discussed after the following section on methods and LLL programmes.

Besides social exclusion, it should also be acknowledged the links set during the Sixth International Conference on Adult Education (CONFINTEA; 2017) between LLL and the 2030 Agenda for Sustainable Development by United Nations (Robinson, 2017). The conference affirmed the essential role of LLL in supporting the future transformation of the world, especially with regards to population health, environmental sustainability and economic resilience.

2.2 Traditional and new methods for delivering lifelong learning and job market inclusion in European young adults

In the following sections, we present different LLL programmes (i.e. apprenticeship systems, vocational training or vocational community colleges, active labour market programmes, ICT training and MOOCs) related to LLL policies development. Starting from the more
traditional and established programme, we will introduce next how computers and the internet have harnessed best to improve the efficiency and effectiveness of education at all levels and in both formal and non-formal settings.

2.2.1 Apprenticeship systems and vocational practices. In the review table, it is interesting to address the various ways in which EU member states deal with the transition from school to employment in their own country. Traditionally, there are three different ways in which the labour market integration of young peoples is organized in: apprenticeship systems (i.e. young people enter a company and attend vocational school-based training simultaneously), school/college-based vocational education, higher education (i.e. young people learn skills in an institutional setting) and learning-by-doing (i.e. young people enter the workplace and learn the necessary skills while working). In most countries, all three pathways are used depending on different occupations; however, the relevance of the different channels varies. For example, in Germany, despite many worries that the dual system no longer provides the safe transition to employment it once did (Busemeyer and Trampusch, 2013), still more than 60% of a school-leavers’ cohort enter an apprenticeship (BMBF, 2013); while in the UK, the higher education initial participation rate of 18 and 19-year old in learning was 23% (Department for Education, 2014). Mediterranean and Latin states remain relatively centralized and comprehensive, with continuing domination of a fairly traditional educational paradigm. The Nordic countries moved partially and cautiously toward the apprenticeship system. However, they still stand apart in their regional affinities for local public control combined with structural and curricula integration and universalism. The Nordic states also tend to have extensive participation in adult continuing developing the established European LLL key-competences and have, arguably, gone further than most in realizing the goals of LLL (Öhrn and Weiner, 2017). As well, the vocational education and training system is seen as a priority by the European Union to promote the development of the member states. This priority has also been reaffirmed by the Maastricht Communiqué of 14 December 2004, which indicated the need for greater European cooperation in the field of Vocational Education and Training (VET), identifying the commitments that each EU member state would take actions that need to be done in this regard (Oliver, 2010).

In addition to these established pathways, many national governments installed active labour market programmes. Originally, these programmes were meant to be temporary and should address mass youth unemployment in the 1980s or after the transition of Eastern European countries (Sharland et al., 2013). However, they seemed to have become established systems to address mainly disadvantaged people. Ideally, programmes address the individual needs of young people by getting skills to find employment (e.g. Careers’ Services, finding an appropriate occupation, identification of necessary qualification needs, CV writing, job interview training), aid to gain the necessary qualifications and skills to enter a profession (e.g. school-based apprenticeships or other vocational training) or subsidized employment: i.e. young people enter temporary employment to gain work experiences and manage to build up networks, which should improve their chances in the unsubsidized labour market.

2.2.2 Innovation and new technologies for enduring learning. As a recognized part of training procedures, the Information and Communication Technology (ICT) in the learning and training field has made progress over time. This is noticeable in the last studies present in the review table suggesting that the integration of ICT in training has positive effects on learning results (Bates, 2001; Diochon and Cameron, 2001; Jochems et al., 2013; Leask and Pachler, 2013). The way in which learning can result from the combination of education and training with the use of ICT is principally known as e-learning but also as computer-based
training (CBT) and web-based training and, eventually, as MOOC, (Ismail, 2001; Šumak et al., 2011). MOOC have been considered as a possible solution for many emerging states for promoting a low cost but effective teaching system (Kaplan and Haenlein, 2016). For example, learn LLL key-competences such as word processing, programming, image editing, financial spreadsheets and web development do not necessarily require the presence of traditional education.

The reason why there are a variety of technologies, methodologies, frameworks and architecture systems available, is because the impact of learning aspects change, based on different user types, the subject of learning, and e-learning interaction necessary. The importance of multimedia learning aspects, for example, is related to the ability of users in dealing with these new instruments, which are in turn related to some user differences, as argued within the framework of the technology acceptance model theory (Davis et al., 1989). Current technology acceptance research evaluates causal effect sizes between unskilled and experienced users (Šumak et al., 2011). The acceptance of e-learning, studies commonly, consider young adults as typical users, where researchers usually find high acceptance of e-learning technology about this young generation compare to the previous ones. As well, from another point of view, the successful implementation and introduction of e-learning technologies require adaptability among teachers, professors and trainers who use these technologies for providing learning materials to users (Šumak et al., 2011). Usually, such people need training too, to develop those LLL competences for benefiting, providing and spreading a better e-learning service.

E-learning technologies are mainly used in educational institutions, but as well in organizations to offer advanced ways of providing education to their users. The use of these technologies in the organizational field is quite recent. E-learning, as well as distance education systems, and MOOC have been considered by organizations as a possible solution for promoting a low cost, but effective training system, face learning challenges. But it is not only a question of costs; education programmes aim to address the worst contemporary problems: unemployment, skills mismatches and lack of labour mobility without borders inside or outside organizations, companies and institutions. Considering the Work programme 2014–2015 of Horizon 2020, in fact, the ICT is crucial to boosting the modernization of education and training for the developing the so-called LLL competences. The challenge is to reinvent the education ecosystem and re-empower teachers in the digital age. Partnerships and collaboration between public and private stakeholders – including innovative entrepreneurs – more open and innovative practices for richer and more engaging and motivating learning and teaching experiences will be key to facilitate the transformation of the education and training.

3. Discussion
As seen, in the last decade, a new model of LLL policy was developed to facilitate a more advanced understanding of processes of social inclusion. The approach recognizes the multi-dimensional nature of vulnerability and the ways in which young people draw on different resources to secure employment. To make effective these transitions, young people have to draw on a variety of resources including educational qualifications, vocational training and skills, as well as general knowledge. Aspects of a personal agency such as initiative and motivation are also crucial, and it is essential to acknowledge processes of rationalization as a factor that provides a mediating link between such personal resources and above outcomes. In many cases, young people are able to compensate for deficits in specific resources (education, for example). However, when a resource deficit is combined with weak policy agency, there is likely to be a dramatic increase in the chances of “negative” outcomes.
In these circumstances, those who were unable to rely on previous formal education were most vulnerable to social exclusion. In light of this, the development of LLL competences becomes the first step to take for any educational policymaker. In the next section, we will analyze the expected outcomes of such LLL policies and a discussion concerning recent criticisms on such programmes follows.

3.1 Employability and strategic lifelong learning key-competences development as significant outcomes of lifelong policies in Europe

With the economic crisis, the decreasing of job positions for younger, and the concurrent high rates of youth jobless, young people are remaining in education and training for a longer time and they get a stable occupation later in life. On the other side, a growing number of them find new ways of combining part-time work with education and training paths, sometimes through long periods. In most of the European countries, there has been a trend to shorter job periods, job jumping, the prevalence of part-time and short-term jobs and self-employed work (Mackenbach et al., 2008). The psychological result of being a young adult without a work identity and continuously in training can generate situations of distress and negative mental states such as anxiety, depression, isolation, disaffection, disengagement, and, eventually, social exclusion (Quintano et al., 2018; OECD, 2016). Lifelong learning policies are, in a way, responding to the demands of such a context. They look for providing a greater variety of flexible learning possibilities, including different settings of learning, by replying to the challenges of modern life and to the diverseness of individual needs. Personalized training careers involve individuals able to take responsibility for building their personal learning pathways to increase their strategic LLL key-competences and next employability. Nevertheless, this also means that organizations and communities must be sensitive to people’s needs. For this reason, in many instances, LLL policies are recommended as a way of promoting social coherence (although not much attention is paid to how this can be reached).

Analysis of policies across Europe ranges all the way from demand-led of voluntary partnership in the UK (i.e. the network model) to the more formalized social partnership models of the northern continental and Nordic states, to the more static models common in more of the southern European states (Green, 2002). The common trend in legislation and governance in Europe has been away from direct government administrative control over educational processes and towards greater devolution of operational control to other levels. Given that, the growing uncertainty of employment has prompted new models for employment practices, eventually leading to new patterns and status of careers (Mills et al., 2006).

Lifelong learning policies represent a driver to foster expertise among multiple organizations and jobs, potentially enabling creativity and performance (Maurer, 2001). Such a consideration appears of particular importance given that nowadays fewer individuals follow stable or expected career patterns within one organization, whereas a greater and growing number of career experiences are likely to develop across, rather than inside of, company boundaries (O’Mahony and Bechky, 2006). Such a mobile labour force may well need to rely on LLL policies interventions aiming at fostering higher employability. In line with literature from the career realm, it is underlined the role of the individual in continually managing career-related changes, entailing willingness and adaptability (Pulakos et al., 2006) and defined career identity to give direction to one’s career pathway. Such a LLL skill can be well-defined in terms of employability, which refers to the full range of individual capabilities to gain and maintain an employment and to obtain a new one if required (Hillage and Pollard, 1998). Employability has been
conceptualized from multiple perspectives and theoretical proposals, which encompass a focus on the individual, the organization, or the society as a whole. Such a construct, therefore, represents a concept underlying the development of LLL policies aiming to enable young adults to identify and develop the key-competences necessary to find, retain and progress in employment.

3.2 Lifelong learning policies collateral effect: challenging young people social exclusion issues in contemporary Europe

Young people at risk of social exclusion can also hold multiple disadvantages (e.g. disabilities, lack of school qualification, belonging to a minority ethnic group), all of which decrease further their chances of finding, retaining, and progressing in employment. Other young people come from a family background where previous generations were excluded from the labour market, and thus, lack an understanding of the needs to acquire or retain key-competences. These conditions can create vulnerable groups of people with few chances to be involved in LLL programmes. However, even without these kinds of disadvantages, the number of young people not in education, employment or training (NEET) within Europe remains high. It is remarkable that the number of young people not in employment but attending formal education varies across different European countries.

The differences stem from the educational systems, but other factors such as the length of compulsory schooling and access to tertiary education also play a role. On average, 37% of all young people within European member states are in formal education; however, this varies across the individual member states. After leaving formal education, they are either unemployed, inactive, passive job seekers, discouraged to enter the labour market or deliberately to avoid it. In 2009, when the financial crisis worsened by leaving few available jobs, in the EU, nearly 17% of the population 18–24 years of age were classified as NEET, varying from 6% in The Netherlands to 26% in Spain.

As seen earlier, LLL is expected to contribute to overcome the economic and social crisis and meet the Europe 2020 targets on employment, poverty reduction, education, sustainability and innovation. Especially for young adults, suitable LLL skills and qualifications are necessary to gain access to employment. In recent decades, there have been structural shifts which created mismatches between labour supply and demand (e.g. shift towards the service industries, shift towards non-manual labour) and those without the skills to adapt to these changes are more likely to become long-term unemployed or to work in low-paid unstable work (Forrier and Sels, 2003). Recent research shows that in a European comparison, there is a less vertical mismatch if the school-to-work transition is more highly stratified (Levels et al., 2014).

Lifelong learning, in this context, allows young people to build up a lifelong habit to adapt to changes in the workplace. As the Education, Youth, Culture and Sport Council meeting recalls that the last economic crisis accentuated the importance of the education to work transition: ensuring that young people leave education and training with the best possible support to obtain their first job is critical. Young people who face unemployment or a slow transition may experience long-term adverse effects in terms of future labour market success, earnings or family formation. This may, in turn, jeopardize public and private investment in their education and training, which results in a loss for the society as a whole. This is particularly true in the context of demographic challenges, which put added pressure on Europe’s increasing scarcity of young people to integrate quickly and effectively into the labour market. As a consequence, several EU benchmarks set for the 2020 focus on the transition from education and training into the labour market for facilitating policy exchanges under the Education and Training 2020 (ET2020) framework on measures to
enhance the employability of graduates (Council of the European Union, 2012). Moreover, for young adults, it is also relevant to remaining trainable by understanding the need to develop key-competences according to changes in the workplace. Nowadays every workplace presents rapid changes in tasks and in the structure, and it requires employees with the ability to adapt to these changes, to be positively engaged in LLL programmes.

3.3 All that glitters is not gold: risks connected to lifelong learning programmes and new challenges

Considering the situations seen above, the presence of several policies, programmes, institutions and guidelines related to LLL constitutes an important background for an analysis of existing LLL policies across European countries. On the other hand, the risk of an uncontrolled promotion of LLL policies exists. For instance, it is important to consider LLL as a universal right; however, it must be contextualized on the basis of the real needs of the stakeholder. Among others, the greatest risk is to create a logic of competition that encourages the continuing education of people already trained or with a stable job, excluding those who are not entered in any career or training programme.

Moreover, another challenge to be faced is represented by the uneven distribution of the costs for LLL between enterprises, individuals and families (OECD, 2001). Both the underrepresentation of vulnerable groups and the uneven distribution of funding show the persistent weakness and ineffectiveness of some adult education policies. However, the role of LLL is still vital to overcome the economic and social crisis and to meet the Europe 2020 targets by fostering higher. Indeed with the last decade, the focus on young people was reinforced with the adoption of the first European LLL political strategy. Quality education and training, successful labour market integration and increased mobility were identified as key to unleashing young people’s potential and achieving the ongoing Europe 2020 objectives. To reach such goals, EU LLL programmes, policies and strategies were implemented as follows:

- The Youth Guarantee Scheme, which has been implemented at European or national level to ensure that all young people aged under 25 get good-quality employment offers, continuing education or an apprenticeship or traineeship within four months of leaving school or becoming unemployed. It is included in the Youth Employment Package.
- The EU Youth Strategy for 2010–2018, which aims to provide more and equal opportunities for young people in education and in the labour market, and to promote active citizenship and social inclusion for all young people.
- Youth on the Move, a framework of policy priorities for action at national and EU level to reduce youth unemployment by facilitating the transition from school to work and reducing labour market segmentation. Here, the role of public employment services is vital, as they promote the Youth Guarantee scheme to ensure that all young people are in a job, in education or in activation, creating a European Vacancy Monitor and supporting young entrepreneurs.
- The agenda for new skills and jobs (COM:2010; 682): a European contribution towards full employment, aimed at enhancing the performance of education and training systems and seeking to equip young people with the relevant skills and competences for labour market needs. Which aims to improve employability and employment opportunities for young people.
- The “Youth employment initiative” (2013), which reinforces and accelerates the measures outlined in the “Youth employment initiative”. It supports particularly young people not in education, employment or training in regions with a youth unemployment rate above 25%.
It is expected that appropriate investment in LLL will contribute to the overcoming the economic and social crisis and meet the Europe 2020 targets on employment, poverty reduction, and innovation. However, since then almost fifty policies have been developed over the last twenty years, recognize successful LLL programmes, both traditional and innovative, already reach out to young adults at risk of work and social exclusion, might help for developing new and better programs. In the next section, we analyze the practical implications concerning the present review and ways for managing such data.

4. Practical implications

Analyzing why, for which particular target group, and in which national and regional section, LLL programmes can be identified as successful could lead to better policy-making implantation. A practical proposal could be related to the development of a computational model that analyses, simplifies and connects data from all EU policy documents to allow easier access to information and to support policymaker in the different phases of the policy cycle. In this way, the policymaker would have the opportunity to explore the consequences of the introduction of new policies in advance of its effective application following a "what if [...]" approach. The investigation should consider quantitative and qualitative analyses to investigate policies both at the European and at the national level and in particular LLL policies, considering diversity issues as gender, culture, language, educational attainment, LLL competences developed, labour status, costs of previous LLL projects, etc. This would be an opportunity to generate new scientific knowledge, to create cooperation amongst different European countries and to collect data to compare and analyse adult education across Europe.

Since that most Educational and Training systems are now LLL competencies-centered, to guide the analysis of EU policies, the European taxonomy of Skills, Competences, Qualifications and Occupations (ESCO) can establish a framework capable of transcending sector and national specificities. Developed by the European Commission, the CEDEFOP (European Centre for the Development of Vocational Training), and a group of stakeholders, this taxonomy focused to the creation of a common language between education and training, and the labour market. ESCO is structured in three main hierarchical pillars: occupation (i.e. a grouping of jobs involving similar tasks, and which require a similar skillset); skill and competence; qualification (i.e. the formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards). These pillars are interrelated to each other.

In June of 2002, the European Commission identifies fifteen qualitative indicators of LLL grouped in four main areas:

(1) skills, competencies, and attitudes (Area A);
(2) access and participation (Area B);
(3) resources for Lifelong Learning (Area C); and
(4) strategies and system development (Area D).

In light of this LLL policy analysis, the assessment and feasibility of the policy-making could be supported by intelligent DSS based on this common language. DSS is a computer technology solution that can be used to support complex decision making and problem-solving.

Over the past three decades, DSS has taken on both a narrower or broader definition, while other systems have emerged to assist specific types of decision-makers faced with specific kinds of policy-making problems (Shim et al., 2002). As a computer-based system the DSS, simplifying the language, knowledge, and problem processing systems, could: and
spell out the multiple indicators, taxonomies, and analyses conducted;
connect all variables aimed to highlight the theoretical policy-effects associations.

In the end, the model could show the effects of the overall system under the application of a certain policy. In this way, to obtain the desired achievements, the policymaker would have the opportunity to explore the consequences of the introduction of new LLL policies in advance, as well as its effective application, testing different scenarios.

5. Limitations
This study has some limitations, such as the presence of researches with different approaches in the vast area of lifelong learning. Indeed, lifelong learning policies could be applied to very specific fields, such as computer science or medical professions, to extreme generic jobs. Moreover, approaches of such studies present methodological differences among them, which make comparisons hard to establish. Many of these studies are based on descriptive and narrative experiences related to EU projects developed, whereas just a limited portion of them regard quantitative studies. Finally, some of European countries, such as Slovenia, do not present any study in relation to the experience of LLL policies in the past ten years.

6. Conclusion
The aim of this contribution was to deal with and then report about, the education policies aimed at increasing employability applied across Europe, through a comparative review of adult education and LLL. Such a recognition allows unearthing successful programmes applied by countries that tackled the unemployment raising of the past years more efficiently than others, confining the damages arose by social exclusion and inequality. This promises a potential for a stronger strategic focus, greater synergies and sharing best practices, simplification of the structure with fewer actions, as well as changes that are in line with the proposed recommendations for a provision of more inclusive and accessible opportunities. Perhaps most significantly, the new education and training programmes bring about a positive change to the legal framework of the programme, committing the Commission and Member States to ensure particular efforts to facilitate the participation of people with difficulties for educational, social, gender, physical, psychological, geographical, economic and cultural reasons (Kapoor et al., 2017). This is a significant step in the process and represents a unique opportunity to implement LLL for all.

On the other hand, this contribution aimed at proposing a tool to support policy-making, which can be constituted by an intelligent DSS that would facilitate the institutions’ decision processes and its policy-making. In particular, a DSS can show which education policy is needed, preventing future labour crisis and the formation of more NEET individuals. The creation of such an intelligent DSS could have implications on the whole of the European community, especially for policymakers as a guideline in the process of decision making for identifying appropriate measures for supporting young people and adults, taking into account diversity issues that represent risks of social exclusion and deepening the analysis of several labour market policies to capitalize on existing knowledge.

Note
1. Horizon 2020 is the biggest EU Research and Innovation programme ever with nearly €80bn of funding available over seven years (2014 to 2020) – in addition to the private investment that this money will attract. Horizon 2020 is the financial instrument implementing the Innovation Union,
a Europe 2020 flagship initiative aimed at securing Europe’s global competitiveness. Seen as a means to drive economic growth and create jobs, Horizon 2020 has the political backing of Europe’s leaders and the Members of the European Parliament. They agreed that research is an investment in our future and so put it at the heart of the EU’s blueprint for smart, sustainable and inclusive growth and jobs.

References

Abel, D., Jinnai, Y., Guo, S.Y., Konidaris, G. and Littman, M. (2018), “Policy and value transfer in lifelong reinforcement learning”, *International Conference on Machine Learning*, pp. 20-29.

Anastasiades, P.S. (2005), “Web based education and digital divide towards the European lifelong learning society”, *3rd International Conference on Education and Information Systems: Technologies and Applications, EISTA 2005, Proceedings*, Vol. 2, pp. 248-253.

Aurora-Nicoleta, P., Gabriela, P., Carmen, D. and Irina, I. (2010), “A model of pedagogical collaboration: eTwinning in Romania”, *Proceedings of the 4th International Conference on Communications and Information Technology*, World Scientific and Engineering Academy and Society (WSEAS), pp. 124-127.

Bates, T. (2001), *National Strategies for e-Learning in Post-Secondary Education and Training*, Unesco, Paris, FR.

Billett, S. (2009), “Workplace competence: integrating social and personal perspectives”, in Velde C.R. (2nd ed.), *International Perspectives on Competence in the Workplace: Implications for Research, Policy and Practice*, Springer, Dordrecht, NL, pp. 33-53.

Billett, S. (2011), *Vocational Education: Purposes, Traditions and Prospects*, Springer Science and Business Media, Dordrecht, NL.

Bomba, L. and Zacharová, J. (2014), “Blended learning and lifelong learning of teachers in the post-communist society in Slovakia”, *International Journal of Continuing Engineering Education and Life-Long Learning*, Vol. 24 Nos 3/4, pp. 329-342.

BMBF (2013), *Informationen Und Analysen Zur Entwicklung Der Beruflichen Bildung. Berufsbildungsbericht*, BMBF, Berlin, available at: [www.bmbf.de/de/berufsbildungsbericht.php](http://www.bmbf.de/de/berufsbildungsbericht.php)

Breiter, A. (2003), “Regional learning networks – building bridges between schools, university and community”, *Informatics and the Digital Society*, Springer, Boston, MA, pp. 207-214.

Brookfield, S.D. (1986), *Understanding and Facilitating Adult Education*, Open University Press, Milton Keynes, Buckingham.

Busemeyer, M.R. and Trampusch, C. (2013), “Liberalization by exhaustion: transformative change in the German welfare Atate and vocational training system”, *Zeitschrift Für Sozialreform*, Vol. 59 No. 3, pp. 291-312.

Bynner, J. and Parsons, S. (2002), “Social exclusion and the transition from school to work: the case of young people not in education, employment, or training (NEET)”, *Journal of Vocational Behavior*, Vol. 60 No. 2, pp. 289-309.

Ceschi, A., Costantini, A., Phillips, S.D. and Sartori, R. (2017), “The career decision-making competence: a new construct for the career realm”, *European Journal of Training and Development*, Vol. 41 No. 1, pp. 8-27.

Clain, A. (2016), “Challenges in evaluating the EU’s lifelong learning policies”, *International Journal of Lifelong Education*, Vol. 35 No. 1, pp. 18-35.

Coffield, F. (2000), *Differing Visions of a Learning Society: Research Findings*, Policy Press, Bristol.

Commission of the European Communities (2007), *Action Plan on Adult Learning. It is Always a Good Time to Learn*, European Community, Brussels, available at: [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM%3Ac11102](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM%3Ac11102)

Council of the European Union (2012), *Council Conclusions of 11 May 2012 on the Employability of Graduates from Education and Training*, European Parliament, Brussel, available at: [http://eur-lex.europa.eu/legal-content/EN/NOT/?uri=CELEX:52012XG0615(04)](http://eur-lex.europa.eu/legal-content/EN/NOT/?uri=CELEX:52012XG0615(04))
Davis, F.D., Bagozzi, R.P. and Warshaw, P.R. (1989), “User acceptance of computer technology: a comparison of two theoretical models”, Management Science, Vol. 35 No. 8, pp. 982-1003.

Department for Education (2014), Participation Rates in Higher Education: Academic Years 2006/2007–2012/2013, Government UK, London, available at: www.gov.uk/government/uploads/system/uploads/attachment_data/file/347864/HEIPR_PUBLICATION_2012-13.pdf.

Diochon, M.C. and Cameron, A.F. (2001), “Technology-based interactive learning designing an international student research project”, Active Learning in Higher Education, Vol. 2 No. 2, pp. 114-127.

Dondi, C. and Moretti, M. (2007), “A methodological proposal for learning games selection and quality assessment”, British Journal of Educational Technology, Vol. 38 No. 3, pp. 502-512.

Elbers, E. (1991), “The development of competence and its social context”, Educational Psychology Review, Vol. 3 No. 2, pp. 73-94.

European Parliament and Council of the European Union (2006), Recommendation of the European Parliament and of the Council of 18 December 2006 on Key Competences for Lifelong Learning, European Parliament, Brussel, available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32006H0962 (accessed 15 April 2018).

Evaluate IT (2004), Glossary, A Resource Kit for Evaluating Community IT Projects, Queensland University of Technology, Brisbane, available at: www.evaluateit.org/evaluateit_print.pdf (accessed 15 May 2011).

Ferrari, M., Castiglioni, I., Giulia, M.U.R.A. and Diamantini, D. (2018), “Creating an inclusive digital school district in a Northern Italian urban periphery”, Revista de Cercetare si Interventie Sociala, Vol. 60, p. 7.

Fonfara, J., Hellbach, S. and Böhme, H.J. (2014), “Imitating dialog strategies under uncertainty”, Procedia Computer Science, Vol. 39, pp. 131-138.

Forrier, A. and Sels, L. (2003), “The concept employability: a complex mosaic”, International Journal of Human Resources Development and Management, Vol. 3 No. 2, pp. 102-124.

Galanis, N., Mayol Sarroca, E., Casany Guerrero, M.J. and Alier Forment, M. (2017), “Towards the organization of a portfolio to support informal learning”, International Journal of Engineering Education, Vol. 33, pp. 887-897.

Garavan, T.N., Morley, M., Gunnigle, P. and Mchuire, D. (2002), “Human resource development and workplace learning: emerging theoretical perspectives and organisational practices”, Journal of European Industrial Training, Vol. 26 Nos 2/3/4, pp. 60-71.

Gibbs, K., Sani, M. and Thompson, J. (2007), Lifelong Learning in Museums: A European Handbook, Eisai, Ferrara, IT.

Gorard, S. and Rees, G. (2002), Creating a Learning Society, Policy Press, Bristol.

Green, A. (2002), “The many faces of lifelong learning: recent education policy trends in Europe”, Journal of Education Policy, Vol. 17 No. 6, pp. 611-626.

Greener, S.L. (2008), “Identity crisis: who is teaching whom online”, European Conference on E-Learning (ECEL) 2009.

Greener, S. (2009), “e-Modeling – helping learners to develop sound e-Learning behaviours”, Electronic Journal of e-Learning, Vol. 7 No. 3, pp. 265-272.

Hanemann, U. (2015), “Lifelong literacy: some trends and issues in conceptualising and operationalising literacy from a lifelong learning perspective”, International Review of Education, Vol. 61 No. 3, pp. 295-326.

Hanson, M., Engström, E., Kairamo, A. and Varano, M. (2010), “Enhance the attractiveness of studies in science and technology”, Joint International IGIP-SEFI Annual Conference, IGIP-SEFI, Trnava, Slovakia.

Hillage, J. and Pollard, E. (1998), Employability: Developing a Framework for Policy Analysis, DfEE, London, available at: www.employment-studies.co.uk
Hylén, J. (2001), “European schoolnet – bringing the world into the classroom”, Information and Communication Technologies in Education, Springer, Boston, MA, pp. 185-192.

Idahoe-Campus (2009), Glossary, ID electronic campus, Idaho, available at: www.idahoe-campus.state.id.us/tools/glossary.html#learner (accessed 15 May 2011).

International Labour Organization (2000), Lifelong Learning in the Twenty-First Century: The Changing Roles of Educational Personnel, ILO, Geneva, IT.

Irvine, K., Weigelhofer, G., Popescu, I., Pfeiffer, E., Păun, A., Drobot, R., Gettel, G., Staska, B., Stanica, A., Hein, T. and Habersack, H. (2016), “Educating for action: aligning skills with policies for sustainable development in the Danube river basin”, Science of the Total Environment, Vol. 543, pp. 765-777.

Ismail, J. (2001), “The design of an e-learning system: beyond the hype”, The Internet and Higher Education, Vol. 4 Nos 3/4, pp. 329-336.

Jarvis, P. (2004), Adult Education and Lifelong Learning: Theory and Practice, Routledge, London.

Jarvis, P. (2009), The Routledge International Handbook of Lifelong Learning, Routledge, London.

Jenkins, A. and Wiggins, R.D. (2015), “Pathways from adult education to well-being: the Tuijnman model revisited”, International Review of Education, Vol. 61 No. 1, pp. 79-97.

Jenkins, A., Jones, L. and Ward, A. (2001), “The long-term effect of a degree on graduate lives”, Studies in Higher Education, Vol. 26 No. 2, pp. 147-161.

Jochems, W., Koper, R. and Van Merrienboer, J. (2013), Integrated E-Learning: Implications for Pedagogy, Technology and Organization, Routledge, London.

Kaplan, A.M. and Haenlein, M. (2016), “Higher education and the digital revolution: about MOOCs, SPOCs, social media, and the cookie monster”, Business Horizons, Vol. 59 No. 4, pp. 441-450.

Kapoor, K., Weerakkody, V. and Schroeder, A. (2017), “Social innovations for social cohesion in Western Europe: success dimensions for lifelong learning and education”, Innovation: The European Journal of Social Science Research, Vol. 31 No. 2, pp. 1-15.

Kavrakos, M. (2006), “Certification and assessment of lifelong learning. New methodologies of certification through regional development agencies”, 2006 7th International Conference on Information Technology Based Higher Education and Training, IEEE, pp. 113-117.

Kourtoumi, T. (2006), “Social policy and lifelong learning in archives: digital collections as socially intelligent agents”, Proceedings of the International Conference on e-Learning, ICEL, pp. 233-238.

Laal, M. (2011), “Lifelong learning: what does it mean?”, Procedia – Social and Behavioral Sciences, Vol. 28, pp. 470-474.

Leask, M. and Pachler, N. (2013), Learning to Teach Using ICT in the Secondary School: A Companion to School Experience, Routledge, London.

Lenssen, G., Gasparski, W., Rok, B., Lacey, P. and Rodrigues, M.J. (2006), “The Lisbon strategy after the mid-term review: implications for innovation and life-long learning”, Corporate Governance: The International Journal of Business in Society.

Levels, M., Van Der Velden, R. and Di Stasio, V. (2014), “From school to fitting work how education-to-job matching of European school leavers is related to educational system characteristics”, Acta Sociologica, Vol. 57 No. 4, pp. 341-361.

Linkaityte, G., Valtuskeviciute, A. and Zilinskaite, L. (2006), “The role of adult educator in the context of lifelong learning”, International Conference on Cognition and Exploratory Learning in Digital Age, pp. 405-409.

Lodigiani, R. (2008), Welfare Attivo. Apprendimento Continuo e Nuove Politiche Del Lavoro in Europa, Erickson, Gardolo, IT.

McClelland, D.C. (1973), “Testing for competence rather than for ‘intelligence’”, American Psychologist, Vol. 28 No. 1, pp. 1-14.
Mackenbach, J.P., Stirbu, I., Roskam, A.J.R., Schaap, M.M., Menvielle, G., Leinsalu, M. and Kunst, A.E. (2008), “Socioeconomic inequalities in health in 22 European countries”, New England Journal of Medicine, Vol. 358 No. 23, pp. 2468-2481.

Maurer, T.J. (2001), “Career-relevant learning and development, worker age, and beliefs about self-efficacy for development”, Journal of Management, Vol. 27 No. 2, pp. 123-140.

Mihnev, P. and Nikolov, R. (2004), “Towards an organisational model of ‘interface’ university structure as a means of serving lifelong learning needs”, Lifelong Learning in the Digital Age, Springer, Boston, MA, pp. 169-178.

Mills, M., Blossfeld, H-P. and Bernardi, F. (2006), “Globalization, uncertainty and men’s employment careers: a theoretical framework”, in Mills, M. (Ed.), Globalization, Uncertainty, and Men’s Careers. An International Comparison, Edward Elgar Press, Cheltenham, Northampton, pp. 3-37.

Mulder, M. (2007), “Competence: the essence and use of the concept in ICVT”, European Journal of Vocational Training, No. 40, pp. 5-21.

Mulder, M., Weigel, T. and Collins, K. (2007), “The concept of competence in the development of vocational education and training in selected EU member states: a critical analysis”, Journal of Vocational Education and Training, Vol. 59 No. 1, pp. 51-64.

Mystakidis, S., Berki, E., Valtanen, J. and Amanatides, E. (2018), “Towards a blended strategy for quality distance education life-long learning courses: the patras model”, ECEL 2018 17th European Conference on e-Learning, Academic Conferences and publishing, p. 408.

Naumenen, M. and Tukiainen, M. (2010), “Practices in old age ICT education”, Learning and Instruction in the Digital Age, Springer, Boston, MA, pp. 273-288.

OECD (2016), “The NEET challenge: What can be done for jobless and disengaged youth?”, in OECD (Ed.), Society at a Glance 2016: OECD Social Indicators, OECD, Paris.

Ohrn, E., (2017), and Weiner, G. “Urban education in the Nordic countries: section editors’ introduction”, in Leithwood, K. and Hallinger, P. (Eds), Second International Handbook of Urban Education, Springer, Dordrecht, NL, pp. 649-669.

Oliver, D. (2010), “Complexity in vocational education and training governance”, Research in Comparative and International Education, Vol. 5 No. 3, pp. 261-273.

O’Mahony, S. and Bechky, B.A. (2006), “Stretchwork: managing the career progression paradox in external labor markets”, Academy of Management Journal, Vol. 49 No. 5, pp. 918-941.

Peersman, G. (1996), “A descriptive mapping of health promotion studies in young people”, London: EPPI-Centre, Social Science Research Unit, University of London.

Pilkington-Pihko, D. and Suviniitty, J. (2017), “Recognition of prior learning is our performance test of English a good fit for the purpose?”, SEFI Annual Conference 2017, SEFI Société Européenne pour la Formation des Ingénieurs, pp. 962-972.

Pulakos, E.D., Dorsey, D.W. and White, S.S. (2006), “Adaptability in the workplace: selecting an adaptive workforce”, in Burke, C.S., Pierce, L.G. and Salas, E. (Eds), Advances in Human Performance and Cognitive Engineering Research (Vol. 6). Understanding Adaptability: A Prerequisite for Effective Performance within Complex Environments, Elsevier, Amsterdam, NL, pp. 41-71.

Quintano, C., Mazzocchi, P. and Rocca, A., (2018), “The determinants of Italian NEETs and the effects of the economic crisis”, Genus, Vol. 7 No. 5, pp. 1-24.

Robinson, C. (2017), “CONFINTSEA VI. Mid-term review. 25-27 October 2017”, Suwon, Republic of Korea. Report of the conference, UNESCO Institute for Lifelong Learning, Hamburg.

Roland, C. (2010), “Preparing art teachers to teach in a new digital landscape”, Art Education, Vol. 63 No. 1, pp. 17-24.

Rosvik, S. (2003), “National plans and local challenges”, Learning in School, Home and Community, Springer, Boston, MA, pp. 127-135.
Rubenson, K. (2006), “The Nordic model of lifelong learning”, Compare: A Journal of Comparative and International Education, Vol. 36 No. 3, pp. 327-341.

Sartori, R. and Tacconi, G. (2017), “Guest editorial”, European Journal of Training and Development, Vol. 41 No. 1, pp. 2-7.

Sartori, R., Costantini, A. and Ceschi, A. (2016b), “The indirect relationship between neuroticism and job performance in Italian trade workers: a cross-sectional study”, in Di Fabio, A. (Ed.), Neuroticism: Characteristics, Impact on Job Performance and Health Outcomes, Nova Science Publisher, New York, NY, pp. 61-74.

Sartori, R., Favretto, G. and Ceschi, A. (2013), “The relationships between innovation and human and psychological capital in organizations: a review”, The Innovation Journal, Vol. 18 No. 3, pp. 2-18.

Sartori, R., Tacconi, G. and Caputo, B. (2015), “Competence-based analysis of needs in VET teachers and trainers: an Italian experience”, European Journal of Training and Development, Vol. 39 No. 1, pp. 22-42.

Sartori, R., Ceschi, A., Costantini, A. and Scalco, A. (2016a), “Big Five for work and organizations: FLORA (role related personal profile), an Italian personality test based on the five-factor model and developed for the assessment of candidates and employees”, Quality and Quantity, Vol. 50 No. 5, pp. 2055-2071.

Sartori, R., Costantini, A., Ceschi, A. and Scalco, A. (2017), “Not only correlations: a different approach for investigating the relationship between the big five personality traits and job performance based on workers and employees’ perception”, Quality and Quantity, Vol. 51 No. 6, pp. 2507-2519.

Sartori, R., Costantini, A., Ceschi, A. and Tommasi, F. (2018), “How do you manage change in organizations? Training, development, innovation, and their relationships”, Frontiers in Psychology, Vol. 9 No. 313, pp. 1-11.

Sharland, A., Mitchell, D. and Menon, M. (2013), “An international comparison of school to work transition systems: how best to evaluate outcomes”, International Journal of Society Systems Science, Vol. 5 No. 2, pp. 99-112.

Shim, J.P., Warkentin, M., Courtney, J.F., Power, D.J., Sharda, R. and Carlsson, C. (2002), “Past, present, and future of decision support technology” Decision Support Systems, Vol. 33 No. 2, pp. 111-126.

Sienkiewicz, A.C.D.L. and Trawinska-Konador, K. (2014), “The development of the polish qualifications framework as an application of knowledge management in public policy”, European Conference on Knowledge Management, Academic Conferences International Limited, Vol. 1, p. 214.

Sloane, P. (2011), A Guide to Open Innovation and Crowdsourcing: Advice from Leading Experts, Kogan Page, London.

Smidt, H. and Sursock, A. (2011), Engaging in Lifelong Learning: Shaping Inclusive and Responsive University Strategies, SIRUS, European University Association, Brussels, BE.

Sonyel, B. (2004), “The relationship between teacher education, professionalism and lifelong learning”, Information Technology Based Proceedings of the Fifth International Conference on Higher Education and Training, 2004. ITHET 2004, IEEE, pp. 399-403.

Šumak, B., Heričko, M. and Pušnik, M. (2011), “A meta-analysis of e-learning technology acceptance: the role of user types and e-learning technology types”, Computers in Human Behavior, Vol. 27 No. 6, pp. 2067-2077.

TeAchnology (2010), “Letter L teaching terms. The online teacher resources”, available at: www.teach- nology.com/glossary/terms/l (accessed 15 May 2011).

Tempus (2002), “Tempus energy networking towards Central Asia. Glossary of innovation terms”, available at: www.et.teiath.gr/tempus/glossary.asp (accessed 15 May 2011).

Thelen, A.C., Trantow, S., Richert, A. and Jeschke, S. (2012), “Facing the demographic change in European societies: a semantic-based learning and knowledge platform for ageing workers”, International Journal of Learning, Vol. 18 No. 10.
Thiriet, J.M., Yahoui, H. and Frémont, H. (2012), “International dimension to increase lifelong learning possibilities in Europe”, 2012 International Conference on Information Technology Based Higher Education and Training (ITHET), IEEE, pp. 1-5.

Vardiambasis, I., Liodakis, G., Petridis, C., Tatarakis, M. and Kaliakatsos, J. (2007), “Needs and examination of strategies for lifelong learning in engineering education”, 2007 IEEE Meeting the Growing Demand for Engineers and Their Educators 2010-2020 International Summit, Vol. 50, IEEE, pp. 1-9.

Velde, C.R. (Ed.) (2001), “Introduction perspectives on competence development: views and tensions”, 1st Ed., International Perspectives on Competence in the Workplace: Research, Policy and Practice, Springer, Dordrecht, NL, pp. 1-6.

Wheeler, A. and Yeats, R. (2009), “Embedding e-portfolios for effective lifelong learning: a case study”, Proceedings of the 8th European Conference on e-Learning.

Whyley, D. and Westwood, T. (2005), “Placing the learner at the heart of the system. A citywide approach to the personalised learning agenda”, Proceedings of the WCCE.

Widmark, U. and Koroma, E. (2009), “Learning design for creating a lifelong learning organization”, IFIP World Conference on Computers in Education, Springer, Berlin, Heidelberg, pp. 256-262.

Witt, E. and Lill, I. (2011), “Learner perceptions of construction industry knowledge and skills requirements”, Proc. International Conference On Social Science, Social Economy and Digital Convergence, and The International Conference On Manufacturing, Commerce, Tourism And Services, pp. 27-29.

Yankova, I., Denchev, S. and Todorova, T. (2012), “Bulgarian library associations and lifelong learning for LIS professionals”, International Symposium on Information Management in a Changing World, Springer, Berlin, Heidelberg, pp. 174-182.

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