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RESEARCH ARTICLE

ENHANCING DIGITAL LIFELONG LEARNING: WHAT FACTORS MATTER FOR EDUCATION AND TRAINING INSTITUTIONS?

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ABSTRACT

Considering the multifaceted development of lifelong learning, the spread of digital uses, and their influence on the social and individual transformation, this paper analyses factors that could influence digital lifelong learning and affect institutions involved in this emerging field. From an in-depth literature review, it proposes a conceptual framework of digital learning factors that could help to articulate digital learning implementation issues in both formal and non-formal lifelong learning and training institutions.

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INTRODUCTION

Digital learning (DL) is the term which is increasingly replacing e-learning. It concerns the use of information and communication technology (ICT) in open and distance learning (OPL) and contributes significantly to the improvement of living conditions and sustainable development (Podlacha *et al.,* 2016). It also matters with all particular aspects of ICT that can support and enhance teaching and learning (OECD, 2005). Therefore, ICT is not only a trend, but also a culture and attitude (Grace, 2006), then a powerful tool for lifelong learning (LLL) and continuous education. The European Commission in Brussels (2000), as cited in Rubenson (2002), states that "Lifelong learning is no longer one aspect of education and training; it must become the guiding principle for the provision and participation across the full continuum of learning contexts". Similarly Schuller and Watson (2009) also states that, "Lifelong learning includes people of all ages learning in a variety of contexts – in educational institutions, at work, at home and through leisure activities. It focuses mainly on adults returning to organized learning rather than on the initial period of education or on incidental learning". LLL refers as a board set of beliefs, aims, and strategies centered on the tenet of learning opportunities accessible for all, irrespective of age and social status (OECD, 1996). The implementation for such educational settings is crucial to raise skills, both of citizens in society and of the active population at work place. LLL improves common knowledge about global and local issues and thus promote a fairer society. It contributes also to continuous professional development of the active population, thus improving autonomy and internal flexibility. Then, it offers the possibility to upgrade skills for less-prosperous people who might otherwise face unstable work, low wages or unemployment (Nesbit *et al.,* 2007). As Bélanger (2016) states, the reality of learning and education is no longer limited to institutionalized education or as a preparatory phase of adult life course. Alheit (1994:284) observed that "Contemporary life courses seem to have become more difficult: the phases of life one normally anticipate – traditional – life plans – have lost clear contours they may have, and may even cease to exist". In the perspective of transformation, a developmental learning involves a sustainable process which happens through time and space (Meacham, 1997 as cited in Caffarella, ibid:4). What factors could influence this process? This article is trying to answer this question by distinguishing five parts. It presents firstly the problematic, secondly the research question, thirdly the methodology, fourthly a literature review about concepts and factors which can affect learning and our analytical framework and, fifthly, our discussion of the issue.

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PROBLEM STATEMENT

A rapid spread of technology and Internet use, as well as changes in society and in the labour market, is shaping new issues and challenges for learners, for society and, education institutions. Digital revolution increases exponentially access to ICT and global interconnectedness while having a great influence on wages and productivity in labour market and workplaces (Human Development Report, 2015). The enormous potential of emerging ICT gathers more than 7 billion mobile cellular worldwide subscriptions according to the International Telecommunication Union in 2015. In addition, this organization indicates that globally 3.2 billion people are using the Internet, of which 2 billion are from developing countries. Cloud technology, advanced robotics and intelligent software systems are spreading into almost every occupation, including areas considered previously accessible mainly to highly educated people, as well as shaping the rapid evolution of the economy and labour market.

According to the *Global report on Adult lifelong education* and Schuller *et al.* (2016), the digital technology has real impact on learning and is, nowadays, becoming more and more accessible at any time. Rubenson (2006) revealed "a high participation in the Nordic countries in Lifelong Learning and, in comparison to other countries, low inequalities". Thus, DL enhances learning opportunities at the individual scale for literacy and numeracy, practical skills (e.g. ICT), life skills (e.g. resilience, confidence, problem-solving) and cultural interest (e.g. arts, ethics, etc.). On societal scale, it helps to improve human and social capital, full citizenship (becoming more dynamic and self-reliant) and participation in the economy and in society (social, civic and political activities), with social cohesion and integration, interpersonal and institutional trust, social connections, diversity, tolerance and more peaceable and cohesive social relations, learning communities, ethical economies, ecological awareness and environmental sustainability (Schuller *et al.,* 2016).

The *2030 Agenda for Sustainable Development* considers ICT as an immense opportunity to improve the quality and accessibility of Adult learning and education. However, the World Bank (Peña-López, 2016) highlights digital dividends that must be integrated with 'analogue components' to their transformational potential. In fact, while digital technology is having the most profound transformative impact on the way many people live, work, communicate and learn, there is still a digital divide that excludes a large proportion of people worldwide. For example, only 7% of households in less developed countries have Internet access (International Telecommunication Union, 2015). While more people gain access to initial education and could efficiently participate in adult participation throughout their life course, those who don't have this opportunity will face marginalisation and inequity. Yet, underemployment has become a global phenomenon, with many people either out of work or working below their level of qualification and potential employment and labour (Schuller *et al.,* op. cit.).

The global report (Schuller *et al.,* ibid.) observes that many countries have taken stock of their progress over the previous 15 years and have agreed on an ambitious global agenda for the next 15 years. The *2030 Agenda for Sustainable Development* and the *Education 2030 Framework for Action* gives adult learning and education, unprecedented global potential as a tool for progress. It identifies 'children, youth and adults' as its beneficiaries (UNESCO, 2015). The 17 Sustainable Development Goals calls on countries to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all". Sustainable Development Goal 4 includes seven substantive targets, each of which is discussed in detail in the *Education 2030 Framework for Action*. Target 4.3 calls on countries to ensure that citizens have access to technical, vocational and tertiary education. The *Education 2030 Framework for Action* goes further, calling on countries to provide 'lifelong learning opportunities for youth and adults' and stressing that LLL 'encompasses formal, non-formal and informal learning'. Target 4.4 calls on countries to provide more people with the skills they need to find decent jobs. The *Education 2030 Framework for Action* reminds also countries of the need to go beyond the work-specific skills and to equip learners with transferable skills like problem-solving, creativity and ability for teamwork. It also states that learners need opportunities to update their skills throughout their life. Target 4.6 calls on countries to ensure that "all youth learners and a substantial proportion of adults to achieve literacy and numeracy". The Education 2030 Framework recognizes that literacy as well as numeracy is an education continuum: people are literate at different levels. Nevertheless, it sets a threshold to help measure progress: it calls on countries to ensure that all people reach levels of proficiency that correspond to the successful completion of basic education. To measure progress, countries will assess the skill levels of adults, as well as their participation in literacy and numeracy programmes. In the target 4.7, it calls to cover education for sustainable development, human rights, gender equality, peace and global citizenship. The Framework concludes that lifelong learning is the next 15 years main objective for all countries, while digital learning gives the opportunity to realize that objective.

RESEARCH QUESTION

New challenges in the labor market and in society as well as the increasing spread of Internet lead to combine digital learning and lifelong learning in a global concept of digital lifelong learning (DLLL). Considering this association and the need of a multidisciplinary analysis that calls for strategic actions, our question is: what are the factors that affect the adoption and integration of DLLL by education and training institutions? In this paper, the central issue is about designing and offering DLLL (both in terms of structure and format) that adequately supports learners throughout institutions. A strategy for developing a supporting service that meets education and training institution needs will be disputed by identifying the main factors which could impact or help to develop better DLLL design and provide the tight such services.

METHODOLOGY

As the objective of this paper is to identify factors influencing DLLL institutions, the adopted approach examines variables influencing DL across the world and presents a systematic literature review based on the research question, devising search strategy, application of study selection criteria, study design and quality appraisal (Croucher *et al.,* 2003).

Devising Search Strategy

A comprehensive search strategy was undertaken and all the articles were collected from two databases of Google and

Google Scholar. We also used "digital learning factors lifelong in relation to e-learning institutions" and "digital learning factors related to lifelong e-learning" as keywords. Before studies enter into systematic reviews, a selection of studies was made based on two criteria: inclusion and exclusion derived from the review question (Croucher *et al*., 2003).

Design of the Studies

Only studies that show empirical evidence from the experimental or observational research, including a qualitative research, have been included (Croucher *et al.,* 2003). This literature review took into account both published and unpublished works**.** The main focus is the analysis of factors affecting digital learning adoption in lifelong learning education and training institutions.

Quality Appraisal Criteria

The studies included in this literature review have met the quality appraisal criteria noted in Table 1 (Croucher *et al.,* 2003) and selected only those studies which were reliable and empirically valid, as well as offering a relevant research question and an explicit model or theoretical framework.

Table 1. Study Selection: Quality Criteria

Question	Is the research question clear?	E
Theoretical perspective	Is the theoretical or ideological perspective of the author (or funder) explicit?	D
Study design	Is the study design appropriate to answer the question?	E
Sampling	Qualitative: Is the sample adequate to explore the range of subjects and settings, and has it been drawn from an appropriate population? Quantitative: Is the sample size adequate for the analysis used and has it been drawn from an appropriate population?	E
Data collection	Was the data collection adequately described and rigorously conducted to ensure confidence in the findings?	E
Data analysis	Was the data analysis adequately described and rigorously conducted in the findings?	E
Reflexivity	Has consideration been given to alternative explanations of results? Has consideration been given to any limitations of the methods or data that may affect the results?	D
Generalizability	Do any claims to generalizability follow logically; theoretically or statistically form the data?	D
Ethics	Have ethical issues been addressed and confidentiality respected?	D*

E=Essential, D=Desirable, *Ethic may be essential in other sensitive fields.
Source: Croucher *et al.* (2003) as cited in Wallace *et al.* (2005).

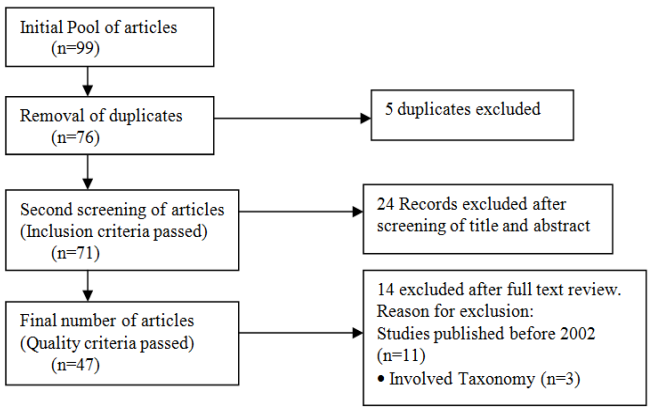

Fig.1. Flowchart of the studies included in the review

LITERATURE REVIEW

This study included a total of 99 articles systematically reviewed on DLLL factors and the proposed framework was designed by compiling 47 articles, as indicated in the flowchart below:

The concepts

DLLL can be defined into three concepts, namely, lifelong learning (LLL), digital learning (DL) and above all learning in its significance today.

The concept of lifelong learning (LLL)

The idea of LLL first appeared in 1970, in the context of the post-World War II optimism about the development,

prosperity, and ability of schooling to promote social equality. LLL was then advocated particularly by UNESCO as a model to promote quality of life and to continuously empower people to adapt and control change related to the major institutional arrangements, namely, state, market and the civil society (Lengrand, 1972; Dave, 1976; Rubenson, 2006). More and more public and economic actors are requesting governments and higher educational institutions to develop a pervasive LLL approach in order to address the three fundamental objectives of education, namely, personal development, social cohesion and the economic sustainable growth. For Field (2001), concepts and approaches of LLL are important references to reform and modernize education and training systems.

According to Bélanger (2016), LLL relates to all meaningful learning activities and could be declined into three forms of learning, *firstly*-formal learning processes that take place in established education and training institutions and usually leads to recognized diplomas and qualifications; *secondly,* non-formal learning processes that usually take place alongside the mainstream systems of education and training – at the workplace, in clubs and associations, in civil society initiatives and activities, in the pursuit of sports or musical interests; and, *thirdly,* informal learning processes which are not necessarily intentional and take place throughout activities and experiences in everyday life. Rubenson (2002) highlights that LLL process is based on three main concepts: (i) first, it calls for lifelong and therefore concerns everything from cradle to grave, (ii) it's related to life-wide, recognizing that learning occurs in many different settings and related to all sectors of human activities, (iii) it focuses on learning as such rather than to education. It is a transformative process for both learners and education institutions.

According to the Lisbon declaration, LLL *"is more than one aspect of education and training since it becomes the guiding principle for providing and promoting the full continuum of learning contexts and participation* (Rubenson, 2002)". Today, men and women need to update, renew and enlarge knowledge and skills learnt at school. LLL is a process which covers all educational experiences (McAllister *et al.,* 2008), a process of knowledge, skill, and attitudes acquisition and updating throughout the entire life (Akkoyunlu, 2008). It refers to learning activities in early childhood and initial school education and throughout the adult life, including the informal learning, stimulated and supported by organized or diffuse learning environments (Bélanger, 1994). "*Embracing all forms of educational and learning experiences, (it) helps individuals*

to engage in purposeful interactions with their environment through the development of their knowledge, skills and critical thinking abilities" (Manzoor, 2014). Lifelong learning biography continues after the departure from school, college and universities through a variety of adult education and learning activities.

Initial education represents an entry point for professional, civic and private life and plays a significant role affecting one's rate of participation to various learning activities throughout the adult life and the relevance of such learning events (Musset, 2010). Bélanger (op. cit.: 358) proposes that initial education should be studied more from the perspective of LLL within three critical angles, namely, i- vital role of the formal and non-formal initial education in terms of helping young learners to take off as well as to begin their post initial learning and educational life; ii- critical state for the present uneven provision of formal initial education in many countries across the world; and finally, iii-"recognition that creativity and curiosity, both as integrated dimensions of the learning process and as one of its outcomes, are a critical attribute" of initial learning in the perspective of LLL. Many higher educational institutions have been unsuccessful in that perspective because of poor strategies, high cost of technologies, resistance to change, competition, and poor delivery of courses (Elloumi, 2004; Saadé, 2003).

Adult education refers to a complex and varied body of ongoing learning processes, formal or otherwise, whereby people regarded as adults by society develop their abilities, enrich their knowledge, improve their technical or professional qualifications or turn them in a new direction to meet their own needs and those of their society (Adult Education Report: CONFINTEA, 1997).

LLL may be compared to a wide-angle lens; "it takes in aspects of learning that have always existed such as adult, non-formal and informal learning – and offers conceptual space to many new modes of learning which are emerging in the information age" (Roche, 2016: 665). According to OECD (1996), lifelong approaches to learning are usually promoted based on two factors. The first factor is the economic demand of countries, communities, businesses and individuals increasingly in need of flexibility and autonomy related to changing factors and techniques of production and more generally by the shift towards a knowledge-based economy, public policy development and a participatory civil society. Using this approach, knowledge and skills are singled out as crucial factor related to lack of required employment competencies, lack of formal initial education, the depreciation of formerly acquired knowledge and the emergence of new discovery. On the other hand, LLL is becoming a basis of active citizenship in creative, enlightened and democratic societies. Faure and Delors cited by Nesbit (2007) state that learning throughout life is an imperative for democratic societies. For these authors, the concept of a learning society sits on three pillars, namely, learning to know (combining a fairly broad general education with in-depth effort on a specific number of subjects), learning to do (developing competencies to deal with different, often unforeseeable situations and the ability to work together in teams, and finally, learning to be (personal independence and judgment combined with a sense of personal responsibility for the attainment of common goals).

LLL creates more learning opportunities for new and different category of learners who, even if they have not all shared a broad knowledge base during their initial education, have an acquired knowledge from multiple sources and diverse practices and learning experiences, etc. (Kehm, 2015). "The research indicates that the creating of a digital learning environment is not simply a technical matter; rather, it demands the consideration of several human and social factors" (McPherson and Nunes, 2004). Human perceptions about technologies determine their attitudes towards them (Aviram and Tami, 2004). Thus, the choice of education technologies should not be guided by a technologically deterministic approach; it should be guided according to contextual requirements related to a broad range of social, cultural, political and economic factors" (Macleod, 2005 as cited in *Kundi et al.,* 2010).

The concept of digital lifelong learning (DLLL)

DLLL refers to autonomous learning, peer-learning opportunities and other learning assisted by digital technologies that can be considerably enhanced through ubiquitous and user-friendly digital tools. Various Internet applications, including video tutorials, webinars, social media and video conferencing, are transforming the ways in which youth and adults access information and knowledge. DLLL has the potential to better achieve *Education for all* and at all ages. It enables educational institutions to enlarge their public, though various approaches and agendas and both formal and non-formal programs (Gunga and Ricketts, 2007). DLLL offers new teaching and learning opportunities to educational institutions across the world (ex. Moocs), although technology adopted is being used quite differently from country to country and from institution to institution (Eke, 2011). Many developing countries are now interested to implement DL within a LLL perspective (Grönlund and Islam, 2010); unfortunately, they experience a lot of difficulties in developing online communication, various instructional designs and many other technical aspects (Hussein, 2007). According to Cieza (2006), "the European Space for Higher Education has as one of its main strategic points the university implication in lifelong learning, further away from the official undergraduate and graduate studies. In this context, the continuous formation or training is a great challenge and the digital learning an allied".

The concept of learning

As Bélanger (2016) stated, the reality of learning and education is no longer limited to institutionalized education or as a preparatory phase of adult life course. Alheit (1994) observed that "*Contemporary life courses seem to have become more difficult: the phases of life one normally anticipate – traditional – life plans – have lost clear contours they may have, and may even cease to exist*". In the perspective of transformation, a developmental learning involves a sustainable process which happens through time and space (Meacham, 1997 as cited in Caffarella, ibid: 4). For education and training institutions today, improving learning involves a search of transformative and developmental learning. As already asserted by Galilee (quoted in Carnegie, 1990:142), "to teach, it is to call back to the others if that they already know". A corollary of this expression relevant to DLL learning would be: to learn, it is to connect new information into an analytical framework with already acquired knowledge. As underlines by

Wenger (1998:3), "it is necessary to adopt a prospect which places learning in our experience lived on participation to the world".

According to Legendre (1993), learning is a process of dynamic acquisition producing internal change to the person, who is moved by the desire and self-development, the search for new coherent and sustainable explanatory representations of one's reality, the stimulations of one's environment. Learning becomes personal appropriation of knowledge and the development of skills, attitudes and values which are added to the cognitive structure of a person; a process which allows the evolution of personal synthesis of knowledges, skills, attitudes, and values. Thus, learning is an intimate process through which individuals construct their individuality by appropriating knowledge from their environment where they become more active and autonomous (Bélanger, op. cit.). Thus, it is a transformation process that brings even irreversible sustainable results, process development joining the long term, and, de facto, helping the participant in the construction of his identity. Every learning process should be a developmental learning process. For Wenger (1998), it should contribute to the personal development which can be defined by four dimensions: (a) practice; (b) meaning; (c) membership in the community and (d) identity. Therefore, learning could be represented by a gradual and continual change oriented for a better life, a complex accomplishment (Legendre, 2005) and "*increasingly higher, more integrated levels of functioning"* (Clark *et al.,* as cited in Caffarella, 1999).

Factors that matter for education institutions

According to the European Commission Staff Working Document (2008), use of DL for LLL has a transformative impact on the teaching and learning practices and policies for education and training institutions. Helios survey (2007) states that in large organizations, DL for LLL has become common practice, but it has not yet matched the related knowledge management challenges. For their part, Surry *et al*. (2002), integration of DL within LLL in institutions usually faces a lot of barriers such as infrastructure of technology, learners' competence, satisfaction of technology and instructors' motivation. How could DLT institutions strive towards those new goals and targets? A part of the answer to this question is embedded into the teaching institutions organizational framework. This is given by Morgan's images of organization (2006). Two of these images matter in this article: the organic image considering the organization as an open system in its environment and the autopoiesis image considering change as a transformative flux. They shape two categories of factors: the global contextual ones and the specific ones.

Mapping global contextual factors

From the first image, digital lifelong learning and training (DLLT) is in interaction with its environment and is, for the most part, a reflection of its own organization. The European comparative study of LLL in higher education institutions, states that rejecting the idea of LLL is "politically incorrect" (Kehm, 2015). Their survey indicated that it has not gone into the critical area of tacit knowledge and remained associated with explicit and "packaged" knowledge. A conceptualization of learning distinguishes three forms of learning, namely, formal, non-formal and the informal learning. According to Bélanger (2016), both initial education and formal education assume a social internalizing control of learning (Inkels, 1964 as cited in Bélanger, 2016). Learning is also a personal, voluntary act that can never be limited to the social or societal requirements. For Bélanger *et al.* (2004), it is important to concentrate on both dimensions: (a) learning and education proposition and (b) the social and economic characteristics and capacities, cultural predispositions and living conditions of individual learners. Bélanger states that any learning or training process should take into account two dimensions, namely, demands and a context or learning environment. For any kind of learning to be developed, it calls upon both the external demand of society and the learning aspirations of potential learners. According to Bélanger (2016), every learning demand is dual; it has two dimensions the social or external and the individual ones.

The correlation between the individual and societal demand could be observed, for example, in the health domain as noticed by the Schuller *et al.* (2016). In a workplace where learning is a relational transaction between individuals and an organization, the duality of learning demand is related as well to organizations requirement as to individual aspirations and experience, what Bélanger calls individual "felt needs". In the context of the workplace, the author indicates that expression of the dual demand for job skills development comprises two dimensions: the perception of usefulness for the planned training known as the "valence" and the perception of its feasibility and potential success called "expectancy". These two dimensions refer to both the exchange value and use value (Bélanger, 2016) for both the organizations and the individuals. While the exchange value represents a return for the work done, use value comes from the direct relevance of competency thus acquired, involving also self-actualization and meaning of work for workers. Hence the worker's demand needs to be taken into account; each individual is an actor to be recognized as a colleague by his or her peer; the development of personal authenticity (Kreber *et al.,* 2007) and sense of agency (Field, 2008) is crucial.

Transformative learning concerns both a cognitive dimension and also two personal ones: self-esteem and motivation, this is what Carré (2006) call *apprenance* which includes affective, cognitive and conative dimensions. Learning depends of on one's life course, life plans (Boutinet, 1999); it's also a search of autonomy or self-efficiency (Bélanger op. cit.). The auto-efficiency is the feeling of personal efficiency, the confidence to be able to realize successfully a task given in a specific context. According to Bandura (2003), auto-efficiency or sense of personal efficiency constitutes the key factor of human action and influence practically all their activities. For Lecomte (2004), the sense of learning efficiency includes the cognitive, social, emotional and behavioral sub-skills, which are crucial throughout the life course.

This capacity of changing could not be easily and effectively expressed, if individuals do not find an enabling environment for the expression of their demand and their search for auto-efficiency. Then, it's possible to make a parallelism between the individual demand and the social demand (Bélanger, ibid.). The social demand is external to individuals and is called for external meaningful institutional requirements at the workplace and or in daily interactions in society. Hence, Bélanger states that learning is both a process of socialization and a process of self-construction. The forming of one's identity is a way of doing and thinking and feeling that is defined by one's social background and inevitably takes place within social frameworks which are diverse. Such actions taken place in

those frameworks are both collective and individual; they expand and transform the framework into multiple circles of differentiated socialization which create various life course spaces and contradictions. In fact, the author considers the results of various processes of socialization as stable and provisional, individual and collective, subjective and objective. The participation as a learning group process can be defined by two dimensions: (a) behavior and movements (individual and collective) and (b) sharing and tasks accomplished in a space of co-presence or co-learning. The social reality of education and training institutions opens the door to a holistic image of those institutions, according to a systematic approach. These organizations, as a system opened in the environment, must be organized to evolve and adapt themselves to their environment which evolves too. This implies that the organization and its environment are committed to "co-creation". Then, it's possible to distinguish two dimensions: (a) macro-environment and (b) operating environment.

Learning demand expression is closely related to the empowerment dimension of learning that is a context which can help individual and collective learners to be involved in their own learning and be transformed as agents of change of their conditions. Such a perspective defines a vision of education and learning that recognizes the right of education, human rights, rights of deference, establishment of equal opportunities for all, cultural dimensions of learning, recognition of intimacy, celebration of diversity, etc. (Bélanger, 2016). Such vision leads to the recognition of learners as a full actor of society. Its articulated policy sets in order to assist and enable citizens and organizations to express their learning demand. It permits also financially to support the education and learning demand at the scale of a nation. Finally, such a vision leads to work places that enable workers to improve their skills in order to become more autonomous agents, hence able of internal flexibility.

According to Sun *et al.* (2009), DL is the convenient and effective way of job-training and continuous education and it is recognized for civil servants to embrace LLL for sustaining competitiveness. In developing countries, DL adoption factors for LLL institutions include motivation towards DL, basic awareness, and the ability of technology, good support, computer training, and the quality learning materials (Bhuasiri *et al.,* 2012). A similar study by Alhomod and Shafi (2013) indicates the DL factors for LLL and results: sufficient user training, organizational commitment, management support, technical support, positive attitude of users, easy to use tools, sufficient training to engineers, sufficient digital learning initiatives, sufficient manpower, availability of info on the digital learning website, support from other departments. Sridharan's *et al.* (2008) study revealed that DL factors in LLL are navigation of course content, university student's attitudes about DL such as participation in the group discussion, collaboration, ability to initiate for discussion topics, and instructor attitude toward students. A study conducted by Cheawjindakarn (2012) based on 19 papers published during the 2000-2012, revealed that factors of DL implementation in LL education and training institutions are grouped into different categories: institutional management, learning environment, instructional design, services support, and the course evaluation.

Alias et al. (2012), based on a study conducted with 120 university learners of University Technology MARA, identified important elements of DL adoption factors for LLL education and training institutions and these factors are ease of use: appearance, linkage, structure and layout, information, reliability, efficiency, support, communication, and security. A similar study by Papp (2000) indicated the following factors: intellectual property, suitability of course for the environment of DL, building digital learning course, course content for the DL, e-learning maintenance course, digital learning platform, and measuring the success of DL courses. A questionnaire-based survey was conducted by Dagada and Jakovlijevic (2004, 2005) indicated DL barriers such as asynchronous communication channels and lack of personalization which decrease the level of interaction between instructors' and learners'. Similarly, a study by Jakovlijevic (2009) on a sample of 40 university learners from a higher education in Johannesburg and all the 40 learners were from a diploma in Computer Studies discipline and these learners were grouped into ten sub-groups. Each sub-group consisted again of four learners. The research revealed a lack of financial resources, technical skills of staff; they show that the expense of DL technologies affects the adoption of the DL in continuing education. Results from Meyer and Warnich (2010) showed that the adoption of the DL in continuing education suffers because of poor teacher training, insufficient departmental support, and lack of teaching resources, overcrowded classrooms and administrative overload. According to Vencatachellum and Munusami (2006), barriers factors to implementing DL are lack of support for training, lack of financial support, difficulty in measuring outcomes, unqualified and unprepared trainers, no freedom and autonomy to learn, IT availability and accessibility, IT training and IT skills, lack of awareness and misconception of digital learning, learner demotivation.

Olasina (2012) showed, from the quantitative method used to carry out his study at the University of Ilorin, that learners' technical skills and DL infrastructure are not adequate in order to meet DL requirements. Lim (2006) as cited in Olugbeko and Izu (2013) revealed three strategic barriers to DL education: professional development, time, and support. Alhomod and Shafi (2013) state the DL critical success factors, namely, sufficient user training, organizational commitment, management support, technical support, positive attitude of users, easy to use tools, sufficient training to engineers, sufficient digital learning initiatives, sufficient manpower, availability of info on the DL website, support from other departments. Abdelaziz *et al.* (2011) conducted a study on the effect of using DL versus traditional lectures and the study concluded that a lack of computer skills affected learners' ability to communicate effectively with instructors. In addition, the study concluded that learners' have failed to participate in online activities because of too many DL barriers. Another study by Lorenzi and Riley (2000) as cited in El Gamal and Abd El Aziz (2011) indicated that a lack of knowledge and skills, and the negative attitudes towards the use of DL are factors that affect by faculty members who resist using DL materials in university teaching. Lwoga (2014) used a questionnaire-based survey at the Muhimbili University of Health and Allied Science (MUHAS); it was sent to 408 undergraduate university learners and the return rate was 66.7%. The results of the study revealed that quality-related factors such as instructor and system are the key predictor of perceived usefulness and user satisfaction for the learners' future use of DL. In addition, the study revealed that the information quality also significantly affects perceived usefulness for the learners' DL management systems.

According to Chantanarungpak and Songkla (2012), DL factors are media and technology, institution and management, instructional design, supporting factors, and the evaluation components. Selim (2007) conducted a study using a questionnaire based survey with 538 learners and on eight groups of DL factors to the implementation of LL training institutions. He indicated that specifically DL critical success factors are based on students' perceptions and included "instructor characteristics (attitude towards and control of the technology, and teaching style), student characteristics (computer competency, interactive collaboration, and digital learning course content and design), technology (ease of access and infrastructure), and support".

Sorting specific factors

Institutional Factors

The Gareth image of autopoiesis refers to an organism's capacity for self-production through a closed system of relations. This capacity is embedded in a holistic view of the change process with emerging and evolving organizational properties that allow a self-organization creation and control. This creation can be influenced by many factors. Institutional factors of DL in LLL institutions include several sub-factors: technological factors, infrastructure factors, management factors, ethical factors. In addition, the institutional factors also include institutional policies (Zhu and Mugenyi, 2015; Frimpon, 2012), ICT infrastructure (Ngamau, 2013; Lwoga, 2012; Venter *et al.,* 2012; Kisanga and Ireson, 2015; Bates, 2009; Namisiko et al., 2014; Rambe and Mawere, 2011; Alamin and Elgabar, 2014), ease of use of the system (Ngamau, 2013), school and institution wide digital learning strategy (Ngamau, 2013), leadership (Ngamau, 2013), management support (Mavengere and Ruohonen, 2010; Ngamau, 2013), technical infrastructure, leadership strategy, management support for training (Fresen 2005 as cited in Masoumi, 2010), need assessment, financial readiness, infrastructure readiness such as Internet connections, cultural readiness, and content readiness (Fresen 2005 as cited in Masoumi, 2010), learning culture, change in study habits, making people understand how to learn (Sela and Sivan, 2009).

Technological Factors

Several researchers indicated that technological factors affect DL in LLL education and training institutions, such as lack of consistent technical support (Mosha and Bea, 2014), ease of use, appearance, linkage, structure and layout, information, reliability, efficiency, support, communication and security (Alias *et al.,* 2012), security and privacy concerns (May *et al.,* 2012), infrastructure planning, hardware, and software (Fresen 2005 as cited in Masoumi, 2010), lack of educational management mechanisms to support the DL initiatives (Rhema and Miliszewska, 2010), weak information and communication technologies (Gunga and Ricketts, 2007), ease of access, internet speed, screen design (Selim, 2007), reliability, accessibility, technical support for lecturers and students, system training for the lecturers and student (Frazee, 2003), ease of navigation, interface design and level of interaction (Volery and Lord, 2000).

Infrastructure Factors

The underlined infrastructural factors are computer infrastructure (Mavengere and Ruohonen, 2010), limited bandwidth, insufficient computer, ICT infrastructure, lack of necessary devices like computers to facilitate continuous access to digital learning, lack of space for the establishment of DL centers (digital learning report 2012 as cited in Kasse and Balunywa, 2013), lack or instability of electricity (Hennessy *et al.,* 2010), Internet availability (Kasse and Balunywa, 2013), lack of space for the establishment of DL centers (Kasse and Balunywa, 2013), IT availability and accessibility (Vencatachellum and Munusami, 2006).

Management Factors

Management factors of DL in LLL training institutions are lack of implementation expertise, exclusive technology focus, limited continued managerial support (Gewald and Jacob, 2013) and (Mridha *et al.,* 2013), management team, managing the content development process, managing delivery and the maintenance (Khan, 2005), time management, efficiency, effectiveness, thinking strategies, motivation, problem solving abilities (Fresen, 2005 as cited in Masoumi, 2010).

Ethical Factors

Some researchers found how ethical factors could affect the implementation of an DL system in LLL education and training institutions; these factors are, namely, social and political influence, culture, diversity, bias, geographical diversity, learner diversity, digital divide, etiquette, legal issues (Fresen, 2005 as cited in Masoumi, 2010) and (Khan, 2005).

Social Factors

Social factors of DL in LLL training institutions include learning style (Lee, 2016), social integration (Arpaci, 2015), cultural interaction (Arpaci, 2015), isolation and decreased motivation (Bélanger, 2015), physical environment (Beck, 2001), recognition and mediation of individual learning demand (Bélanger, 2015), expression of organizational demand (Bélanger, 2015), lack of social integration, lack of cultural interaction, isolation and decreased motivation (Silvestru *et al.,* 2013; Alzahrani and Ghinea, 2012). *Social factors* have a relationship with the institutional factors and vice versa; on the other hand, social factors also have an influence on the individual factors affecting LL training institutions.

Individual Factors

Individual factors of DL in LLL training institutions include prior experience (Bélanger, 2015), psychological harassment (Bélanger, 2015), lack of democracy (Beck, 2001; Beck and Beck-Gernsheim, 2002), deficient recognition of the intimacy of learning (Bélanger, 2015). The individual factors also include several other factors such as learning strategies (Fresen, 2005 as cited in Masoumi, 2010), learners/facilitation of web-supported learning, frequent and constructive feedback to learners, academic background/qualifications, professional training in education/professional development (Fresen, 2005 as cited in Masoumi, 2010), communication with learners (Fresen, 2005 as cited in Masoumi, 2010), attitudes towards students, technical competence (Volery and Lord, 2000).

Individual factors have a relationship with institutional factors as well as with the social factors. According to Bélanger (2015: 67), "individualization is not a normative discourse

promoting individualism, but rather a social change that is leading individuals to see themselves differently and to act differently". Intimacy of learning is a social issue since a society cannot be dynamic, reflexive, and democratic in different domains, namely, social, economic, environmental, political and cultural - without individual creativity and expertise. Intimacy of learning is also a social issue because each individual has an idiosyncratic life course that has a significant meaning with environments as well as conditions that are appropriate (Bélanger, 2016).

participation in professional and social development. This requires three considerations:

- The demand for high-level skills based on intensive knowledge-based economies should be answered with customized learning systems that identify and develop the talents of all learners. This requires evidence-based training systems that identify and develop personal learner talents while providing the necessary information to do so wisely, and the access to effective

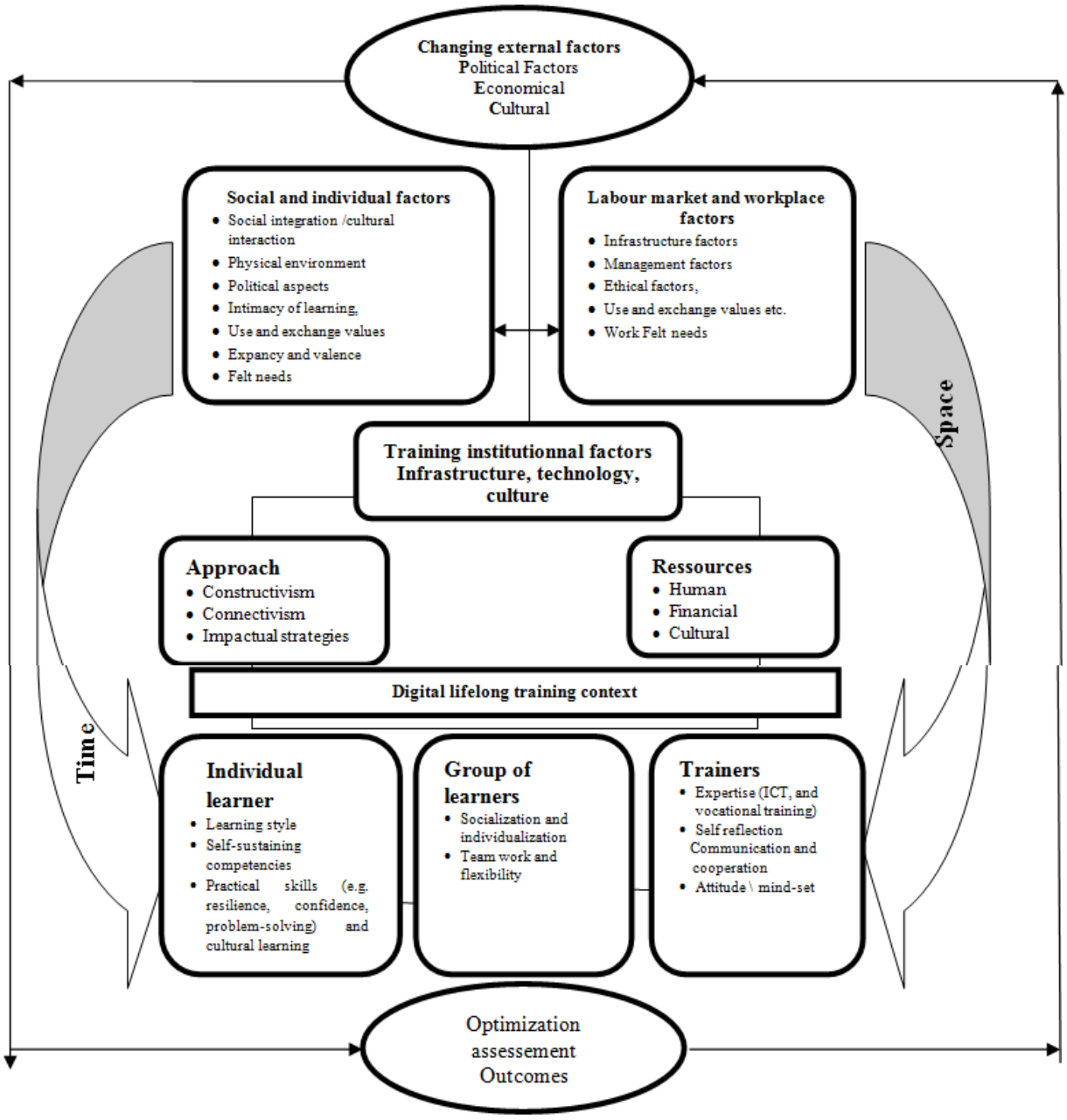

Fig.2. A proposed conceptual framework on the factors affecting the adoption of the DL in LL training institutions

Approach factors

LLL institutions have to move from a traditional model of teaching to the professional relationship between trainers and learners committing to opening up instruction. Bélanger (2016) identified key concepts related to such LLL process: mediation of the learning demand, transformative learning, felt needs, self-esteem, and self-efficiency. Considering these concepts, he highlights the importance in the level and intensity of

support systems to assist them in implementing change (OCDE, 2009). Educational resources and environment should help react to a new situation very quickly and to participate through a friendly and pleasant atmosphere. ICT can provide new opportunities to engage learners and trainers in discovering impactful strategies. The increased professional adoption of ICT and social media should help to improve the social sharing and enable training and learning practitioners to connect and

engage with geographically remote communities to form distributed networks of knowledge sharing (Schuller *et al.,* 2016). "Pervasive learning facilitated via social sharing in such a way offers learners flexibility in terms of community, autonomy, geographical location and relationality" (MacKinnon *et al.,* 2016).

- The transformation of working methods in industry and the emergence of participative democracy requires new individual and collective capacity to manage and perfect a more integrated and flexible pattern of the work. Podlacha et al. (op. cit.) indicates that personal competencies, identified as psychological and professional competencies that are recognized as the trainer 'expertise, are now complementary. Trainers should acquire knowledge and skill to digitize their online teaching while creating and offering an adaptive perspective of learning and teaching with unlimited potential (Dončevski as cited in Thöne, 2016).
- For the learner, transformative training should help psychological strengthening and increase the learner' self-esteem and the appreciation of its competence by the others (self-confidence). A method is required "that forces and challenges the learners to think critically and to adopt a critical attitude toward the world. It is a pedagogy that enables learners to break the chains of alienation imposed upon them by mechanistic nature of their daily routine" (Freire, 1971). Both trainers and learners should engage in creative problem solving and approaches that require inquiry, analysis, and inventive solutions and creations.
- Trainers should give priority to the creation of a "knowledge-rich environment", evidence-based education systems and the access to effective support systems to assist them in implementing such change. The dynamic between individual and collective learning should allow communication and information exchange at the heart of the training and learning system and practices. Trainers and learners need to become partners as both make transitions into new ways of learning. Trainers should revive curiosity, discoveries, and experiential learning opportunities. This exchange requires a reflexive method of teaching and social competences based on reflection, communication, cooperation (Podlacha *et al.,* op. cit.).

Evaluation Factors

Some researchers discovered that the evaluation factors affect the implementation of DL; these factors include evaluation and assessment (Papp, 2000 and Silvestru *et al.,* 2013), program evaluation (Cheawjindakarn *et al.,* 2013), DL content development process, DL evaluation program, learners' learning assessment (Khan, 2005). However, an adaptive process of assessment should help to optimize the transformative dimension of learning processes.

DISCUSSION

The prime objective of this study was to identify factors that affect LLL and DLLL training institutions; the methodology was based on a systematic review process of relevant publications. A total of 99 articles was retrieved from the Google and Google Scholar Databases and a total of 47 articles passed the quality appraisal criteria and all the major factors of DL were considered to design the proposed framework in line with the Technology Acceptance Model (TAM) (Davis, 1989) and the Theory of Planned Behavior (Ajzen, 1991) to adopt a technology. These dimensions may be grouped into three sub-groups: close context, medium context and the larger context. Davis (1989), following the Technology Acceptance Model, towards the following variables: perceived usefulness, perceived ease of use, actual use, and the user acceptance. Regardless of which theory is followed, these dimensions are external variables which can influence the perceived usefulness and perceived ease of use of DL in LLL education and training institutions and more generally its implementation. However, there is a need for future research in order to validate further which factors affect the implementation of digital learning in the educational institutions and how they interact as well as to develop a framework based on those digital learning adoption factors.

CONCLUSION AND RECOMMENDATION

The findings and the analysis of literature reviews indicated factors having an influence on the implementation of DL in LLL training institutions. This emerging proposed conceptual framework is crucial in developing instructional programs to improve DL implementation in LLL training institutions by instructors and learners. The main limitation of this study to provide the sound theoretical analysis required in such a conceptual framework was to conduct the study with only 42 articles. New studies are required to explore other critical factors like the perception of the usefulness of the planned training ("valence") and of its feasibility ("expectancy"). It will be important also to decipher the interrelation between the factors noted above and to take into account the diverse national infrastructural technological contexts. Furthermore, the demand for LLL within institutions includes, but goes beyond the initial formal education of new generations. It includes the return to structured education of people along their life course, the continuing professional development of graduate university and college learners as well as of all employees and the growing demand for non-formal continuing education intervention across the adult population and in the various areas of human activities. The contextual variety of these growing, learning demands will precisely require DL implementation in these emerging missions of LLL training institutions in the 21st century context of active learning societies.

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