

Organizational Learning in the Academic Literature – Systematic Literature Review

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ABSTRACT:

The European Union (EU) promotes European innovation. Diverse stakeholders have opportunities to create knowledge by engaging in innovation projects. Society expects that projects review how they impact on the community and how they share knowledge and deliver outcomes. This systematic literature review is based on a key word search and analysis of a final sample of 31 academic papers by extracting relevant data from the articles into a Data Extraction Table (DET). Results indicate that four main themes discussed emerge from the sample literature: ICT alignment, Organisational Culture, Innovation Culture, and ICT-readiness. Organizational Learning approaches can provide a framework to design methodology for conducting Societal Impact Assessment, and E-skills and Training. This study specifically adds to the body of knowledge of approaches to organisational learning This perspective can provide additional elements towards the development of a more comprehensive Societal Impact Assessment Toolkit and E-skills and Training Toolkit for the ECHO project.

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Introduction

The European Union (EU) promotes European innovation through its funding programmes for research and innovation. Stakeholders (e.g. diverse organizations of academics, businesses and public organizations) are offered opportunities to create knowledge by engaging in project consortia. Innovation projects

have a strong focus in sharing information, insights and experiences. However, participants may also have conflicting interests for their participation.

Project ECHO (European Network of Cybersecurity Centres and Competence Hub for Innovation and Operations) started in 2019 and aims at organizing a networked approach through effective and efficient multi-sector collaboration. The project works to strengthen proactive cyber security in the European Union. This systematic literature review in part adds to the body of knowledge that the project will cumulate in regards to creating toolkits for Societal Impacts Assessment (SIA) and for developing e-skills and relevant training.

Research and innovation network projects, increasingly face challenges in mobilizing knowledge towards value creation in ways that take into account assessing the impacts and effectiveness of the endeavour (North & Kumta, 2018). Societal expectations increasingly demand that projects review the criteria of the community and have a comprehensive Impact Assessment processes to deliver outcomes that address learning and knowledge sharing (Sánchez & Mitchell, 2017).

The ECHO project will deliver toolkits for SIA and e-skills and training. The underlying paradigms for measuring the effectiveness and impacts of network co-creation will be Network Co-creation and Organizational Learning (OL). The purpose of this paper is to, by conducting a systematic literature review provide an overview of how approaches on OL have been discussed in recent academic literature, in relation to Information and Communication Technology (ICT). A practical implication is better understanding how OL could be used as a guiding principle in conducting SIA of innovation projects.

The Research Question of this study is: How is ICT in relation to OL discussed in academic literature?

The content of this article are Methods, Results from the systematic literature review, structured according to four emerging themes, followed by the Conclusions section.

Methods

This systematic literature review is based on a key word search that was conducted in March – April of 2020. The aim is to understand how organizational learning in relation to ICT are discussed in academic literature, and the impacts of e-skills/ICT-skills to organizational learning. To answer the research questions a systematic search was conducted.

The first phase was to conduct a search with the keywords: organization* learning / organisation* learning AND ICT / information technology. Table 1 below shows the process steps of the search. The search was narrowed down with filters (see) resulted in 126 articles. The abstracts of these papers and inclusion criteria applied, after which the number of papers that comprise the final sample of this paper include 31 peer reviewed scholarly articles.

Table 1. Systematic literature review search and sample.

Search Parameters:
RQ1: How is ICT in relation to OL discussed in academic literature?
Search
– Database: ProQuest Central
– Keyword Search: “organization* learning” / “organisation* learning” AND “ICT” AND “information technology”
– Initial results without applying filters: n = 1.417 articles
Filters:
– Search years: 2010 – 2020
– Peer reviewed, Scholarly Journals
– Subject term filter: “organizational learning” / “organisational learning”
– Results after applying filters: N = 77 / 49 = 126 articles
– n = 85 papers excluded based on exclusion criteria: do not include key words in abstract, title, and subject terms.
Final sample:
– n = 31 peer reviewed scholarly articles, based on inclusion criteria: keywords included in abstract, title and subject terms.

In the second phase, this final sample were analysed by extracting relevant data from the articles into a Data Extraction Table (DET), which was specifically designed as an Excel work sheet for this study. The DET has relevant columns for research questions and emerging themes, while the rows correspond to the 31 sample articles. The results are discussed in the following section.

Results

Results indicate that there are four main themes that are most discussed in the sample literature: ICT alignment, Organizational Culture, Innovation Culture, and ICT-readiness (Table 2).

According to Lu et al. (2019), ICT has a critical role in innovation, and is considered crucial in transforming business processes and supporting decision-making, write Cupiał et al. (2018). Table 2 below gives an overview of the themes that emerge from the sample of academic literature. Column one lists the authors and column two lists the main themes discussed.

ICT in Organizational Learning

Im, Porumbescu, & Lee (2013) assess approaches to use ICT as a medium to interact with citizens. Huang, Gardner & Moayer (2016) argue that there are clear benefits of ICT as a catalyst for Knowledge Management practices. ICT are mostly applied to existing processes, such as improving internal and external flows of information (Im, Porumbescu, & Lee, 2013).

Table 2. Themes emerging from literature review.

ICT alignment (10 articles)	
Im, Porumbescu & Lee (2013)	– Assessment of ICT to interact with citizens
Choe (2016)	– Applications of knowledge resources for organizational performance.
Hortovanyi & Ferincz (2015)	– On-the-job learning and ICT
Arh, Blazic & Dimovski (2012).	– Impact of technology-enhanced learning and organizational learning on the business performance
Lopez-Nicolas & Soto-Acosta (2010)	– ICT and organizational learning (OL).
Lu, Pishdad-Bozorgi, Wang, Xue & Tan (2019)	– ICT implementation practices of SMEs
Cupiał, Szeląg-Sikora, Sikora, Rorat & Niemiec (2018)	– Modern enterprise knowledge management process is supported by information technology
Huang, Gardner & Moayer (2016)	– Optimizing learning and knowledge creation – Interfaces between human (soft) and ICT (hard) networks
Mihalic & Buhalis (2013)	– Competitiveness and ICT implementation is gaining on importance
Hernandez, Jimenez & Martin (2010)	– Acceptance of business management software
Organizational culture (8 articles)	
Turi et al. (2019)	– Cognitive, behavioural and social factors of learning with the moderating role of mobile technology
Lemmetty, & Collin (2019)	– Employees in the ICT sector describe self-directed learning practices in the context of workplace learning
Siddiqui, Rasheed, Nawaz, & Abbas (2019)	– Knowledge Management (KM) in the implementation of ICT
Cha, Hwang & Gregor (2015)	– Transformation (resources, capabilities, and outcomes) to the success of IT-enabled organizational transformation (OT)
Cerne et al. (2012)	– Relationship between organizational learning culture and innovativeness.

- Yau, & Cheng (2011) – Factors Hindering the Learning of ICT
- Yau, & Cheng (2010) – Influence of organisational defensive patterns on learning ICT
- Sabri & Sabri-Mat-anagh (2012) – Events and activities that generate initial momentum
- Fluctuations in momentum over time, and the attributes of time, technology, scope, human resources, and cost of implementing technology

Innovation culture (10 articles)

- Isidro-Filho, Guimarães, Perin & Leung (2013) – Relationships between workplace learning strategies and professional competencies after adoption of innovations supported ICT
- Conková (2013) – Relationship between learning-related factors and knowledge transfer performance
- Gu & Tse (2010) – How to build innovative organizations
- Skerlavaj, Dimovski, & Desouza (2010) – Patterns and structures of intra-organizational learning networks
- Tworek, Walecka-Jankowska & Zgrzywa-Ziemak (2019) – Reliability of IT in shaping organization ability to develop innovations
- Saleh & Abel (2018) – Supporting learners in digital environments
- Marwan (2015) – Teachers’ use of ICT
- Zhao & Kemp (2013) – Individual, social and organizational factors may influence Web-based workplace learning
- Wiredu (2012) – Challenges of IS innovation in public organizations
- Senapathi (2011) – Mechanisms for disseminating knowledge

ICT readiness (3 articles)

- Rahman, Islam & Abdullah (2017) – Knowledge sharing between business organizations
 - Salleh et al. (2012) – Relationship between learning-related factors and knowledge transfer performance
 - Perez-Soltero et al. (2017) – Low level of use of ICT in SMEs
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Im et al. (2013) find a specific importance on public service delivery to citizens, which ICT facilitates by increasing the dissemination of accurate and balanced information on public capabilities and expectations. Governments typically tend to employ managerial models, where they apply new technology to

existing administrative processes, and serves to reinforce existing institutional arrangements and organizational status quo. Participative or consultative models of ICT deployment with mobile technologies in the learning organizations have promoted the creation of new learning experiences (Im et al., 2013).

ICT enables companies develop skills to absorb knowledge from external sources and have access to state-of-the-art knowledge, even despite having limited resources (Cupiał et al., 2018). According to Hortovanyi and Ferincz (2015), knowledge generation and information processing promote productivity and competitiveness and ICT can act as a catalyst for organizational learning. ICT facilitates the storage and sharing of organizational knowledge, and ICT tools, help knowledge workers in public organizations capture knowledge and expertise, which then becomes available to society, write Im, et al. (2013).

Information Systems strategies should align with business strategies, so that the orientation of the development of the IT-infrastructure is clear and without conflict for all members of the organization (Choe, 2016). ICT-implementation is gaining importance in building competitiveness (Mihalic & Buhalis, 2013), while ICT enables rapid search, access and retrieval of information, which in turn supports collaboration and communication between the all stakeholders of the organization (Im et al., 2013). ICT can offer opportunities to enhance strategic learning, even at distance (Lopez-Nicolas & Soto-Acosta (2010). Hernandez, Jimenez & Martin (2010) note that business survival may depend on firms' capabilities to implement new IT, and on their ability to take advantage of the opportunities that new IT can offer.

Organizational Culture

Leadership plays an integral role in successfully integrating ICT-technologies; leadership is needed to promote positive policies and a sense of readiness, as opposed to being resistant to change (Cha, Hwang & Gregor, 2015). Learning is a necessary function for organisations (Lemmetty & Collin, 2019), and Turi et al. (2019) note an increase in the use of mobile technologies in the education sector.

Acceptance rates to ICT and mobile technologies are mainly influenced by social factors, such as perception of ease of use. This directly influences the behavior of using mobile learning (Turi et al., 2019), as ICT also makes it easier to store and share organizational knowledge (Siddiqui et al., 2019). Mobile devices can help learn, unlearn, renew and rekindle learning, as their graphics and visual applications have made them into accessible multifunctional gateways to human knowledge (Turi et al., 2019).

ICT-infrastructure can support knowledge sharing in organizations, it can, however, be quite costly (Siddiqui et al., 2019), and a lack of skill or competence to use ICT can hinder learning to use organizational ICT-tools (Yau, & Cheng, 2011).

Establishing an innovative culture that takes into account behavioral and cognitive changes in its organizational learning can help maintain competitiveness, write Cerne et al. (2012). Lemmetty & Collin (2019) promote self-directed learning as a strategy that can be integrated to the structures, processes, and ICT of

the organization to promote individualism and continued training. Yau, & Cheng (2010), however, argue that as change is naturally resisted in organisations the proper implementation of ICT, where communication channels are opened and information flows enhanced, can assist in overcoming this resistance.

In a culture of continuous learning, note Lemmetty & Collin (2019), there are negotiations that take place when learners discover their identity. Employees in ICT-organisations require ongoing learning, which can be driven by the expectations of both the employer and employees. Relevant ICT can help

Organizations achieve effectiveness and manage knowledge assets (Siddiqui et al., 2019). Flexible IT environments can ease the integration of disparate and distributed systems, thus allowing them to, more effectively control their outside environments (Cha, Hwang & Gregor, 2015).

Personal usage of mobile and ICT technology advocates organizational learning cultures, as it enhances individual learning, creates increased innovation and creativity, which results in organization productivity (Turi et al., 2019).

Siddiqui et al. (2019) write that ICT plays a prominent role on knowledge management in organizations, and that their processes, services and product innovation are strongly influenced by ICT-tools, which in turn shapes the organizational culture. According to Cha, Hwang & Gregor (2015) common learning practices, such as training, teamwork, continuous experimentations, sharing experiences and knowledge sources, may promote success in IT-enabled organizational transformation (OT). Sabri and Sabri-Matanagh (2012) find that planning organization-wide communication is critical in building momentum for change, as ICT determines perceptions of momentum during change implementation within an organization.

Innovation Culture

The blended learning style of e-learning and traditional face-to-face interaction can offer possibilities to consolidate the strengths of both styles of learning and thus, eliminate weaknesses such as quality, effectiveness, efficiency, and ability for knowledge application, finds Conková (2013).

Blended learning can improve the corporate training and learning performance and the satisfaction of the trainees (Isidro-Filho et al., 2013). Trainings that upgrade ICT skills makes people more knowledgeable in using various ICT tools and Knowledge Management (KM) technologies, and more knowledge can be transferred and shared, both within and outside the organization (Isidro-Filho et al., 2013; Conková, 2013).

ICT has the potential to enhance learning and knowledge flows within organizations (Skerlavaj, Dimovski, & Desouza, 2010; Zhao & Kemp, 2013). Adopting ICT redefines occupations and work processes within organizations, and cognitive learning efforts are made when people are faced with new information and technological paradigms (Isidro-Filho et al., 2013). Today, learners increasingly rely on ICT (Saleh & Abel, 2018).

According to Isidro-Filho et al. (2013) performance of ICT-based professional competencies are determined by the way in which respondents think, change

and apply their knowledge, skills and attitudes at work. Gu and Tse (2010) argue that organizational culture should foster the development of new talent, who have the skills to utilize ICT in building innovations and competitive advantage. An e-platform that enables collaboration and resource sharing can help learners obtain resources easier and perform their jobs more effectively, write Saleh & Abel (2018).

Skerlavaj, Dimovski, & Desouza (2010) write that organizations that encourage learning from experts of knowledge in order to become experts themselves gain new skills. Tworek, Walecka-Jankowska & Zgrzywa-Ziemak (2019) see that IT-innovation can help transitions into organizational innovation for organizational culture, organizational learning, strategy and policies, as organizations must integrate IT into all its functions to have the potential to influence its organizational performance and competitiveness. Though, Marwan (2015) notes that ICT is only one means of facilitating teaching and learning, and it does not automatically enhance learning.

When IT and public bureaucracy are properly adjusted at their institutional levels, their alignment on an organisational level will be less problematic (Wiredu, 2012). Senapathi (2011) shows that there is correlation between disseminating knowledge and utilizing knowledge management in organizations.

ICT Readiness

ICT is instrumental in supporting knowledge sharing, as it can lower communication barriers and promote collective behaviour; having ICT-support becomes critical for organizational knowledge management systems. By enabling rapid search, access and retrieval of information ICT-support promotes collaboration and communication between organizational members, and it thus, supports organizational knowledge management processes. (Rahman, Islam & Abdullah, 2017).

Salleh et al. (2012) see that investments in ICT-support and ICT-training pay-off in developing higher competencies to use ICT-tools. Perez-Soltero et al. (2017) propose that enterprises consider KM when selecting and implementing ICT solutions. According to Rahman, Islam & Abdullah (2017) ICT-support has direct and indirect influences on the motivation of organization members to share knowledge. ICT-support can eliminate hindrances and provide channels to obtain information, and they may correct flow processes and even identify the location of knowledge carriers and knowledge seekers, which all promotes knowledge sharing.

ICT-training promotes knowledge transfers by up grading the ICT-skills of organization members so that these people become better in using ICT and KM technologies (Salleh et al., 2012). To establish the ideal contextual conditions that drive and optimize the use and organizational KM practices and initiatives, managers must design and implement relevant tools, such as the practical management of human resources and defining corporate culture (Perez-Soltero et al., 2017).

According to Perez-Soltero et al. (2017), SMEs can develop the skills needed to absorb knowledge from external sources; SMEs benefit from the ability to

recognize, capture and assimilate external knowledge, which gives them access to cutting-edge knowledge, even despite having limited resources.

Discussion

The data on the findings indicate that organizational learning remains as a continuous process that requires a dedication to innovation and collaborative activities from the entire organization in order to take advantage of organizational learning benefits. The analysis shows that organization learning can be successfully deployed, but the transition is primarily dependent on the atmosphere of the organizational culture in terms of establishing support of the process. This essentially involves that executives advocate the need for OL and that personnel be receptive to change in the restructuring of the company, and that they foster a positive atmosphere of OL allowing the distribution of knowledge and collaboration that helps expand innovation and specialization in skills to further enhance competitiveness. The results suggest that when these four main elements, discussed in this literature review, become exhibited throughout the activities of the company. Thus, OL with ICT technology can have significant impacts in building innovative culture helping establish competitive advantages.

The results indicate that these facets are important towards the successful utilization of OL. Out of the four themes, the two components that prominently affect the rest of the themes within the process of organization learning are ICT alignment and organization culture. As discussed e.g. by Hortovanyi & Ferincz (2015), ICT alignment and organizational culture need to be congruous with each other in order to incorporate the other two elements of ICT readiness and innovation culture; and Cerne (2012) notes that organizations, need to adopt a learning culture, which means investing in resources that maximize and effectuate innovative behaviour. In conjunction with a supportive organizational culture as aforementioned, the right ICT tools needs to be aligned with this organizational culture, in order to produce the innovative culture, and ICT readiness being the other theme needed to strengthen OL characteristics. The findings show that more attention should be placed on organizational culture because OL is impacted by the culture of the organization, and that all four components need to be simultaneously developed in a continual process in order to effectively incorporate OL in projects and companies.

To conclude organisational learning should not only be prioritized in order to build competitive advantage but primarily to instil essential skills, such as e-skills, which has become a requirement for modern organizations to thrive. Companies could further strengthen organisational learning by integrating a systematic learning package on ICT critical for business processes to address any discrepancy of e-skills competence among staff.

This proposed learning package could be broken down into varying levels of e-skills literacy among personnel. This will provide appropriate training based on their level, in the form of theory trainings, and interactive sessions to further

embed the information. Through this approach all personnel across the organization is tended to, which will help nurture employee confidence and contribute to the organisational learning culture.

Conclusions

Organizational Learning approaches and network co-creation combined can provide a solid to design methodology for conducting Societal Impact Assessment. These two perspectives increase understanding of information sharing, interpretation of meanings, enhancing organizational memory. This study specifically builds the body of knowledge needed to understand approaches in OL. Research and innovation projects have been studied from a co-creation perspective (e.g. Ruoslahti, 2019; Ruoslahti 2018), and including an OL perspective can provide additional elements towards more comprehensive Societal Impact Assessment Toolkit and E-skills and Training Toolkit for project ECHO.

As discussed in the Results section OL can be examined as four themes: ICT alignment, organizational culture, innovation culture, and ICT readiness. This would imply that successful organizational learning in today's digitalized world would have to consider these themes. These may also be considered by project ECHO in designing its Societal Impact Assessment Toolkit and E-skills and Training Toolkit to assess the impacts of ICT and technology-enhanced learning from a perspective of organizational learning.

The literature on ICT alignment looks at ICT implementation practices, how ICT affects OL, and how modern knowledge management processes can be supported by ICT. Optimizing learning and knowledge creation involves interfaces between human and ICT networks, and competitiveness and ICT implementation are gaining on importance in building competitive advantage. Acceptance of ICT and software play an important role in successful ICT alignment.

Organizational culture show ICT having an important moderating role in relation to the cognitive, behavioural and social factors of learning. Employees describe self-directed ICT-aided learning practices in workplace learning. Thus, strategic approaches to knowledge management in the ICT implementation and IT-enabled organizational transformation, that takes into account the relationships between organizational learning culture and innovativeness. In addition, organizations should be mindful of factors that hinder learning and the influence of organizational defensive patterns on learning ICT. These need to be addressed to generate ICT positive momentum and culture. There will be fluctuations in momentum over time, and the attributes that organizations need to consider are time, available technology, projected scope, human resources, and cost of implementing technology.

Innovation culture fosters relationships between workplace learning strategies and professional competencies for the positive development and adoption of ICT to support innovations. The relationship between learning-related factors and knowledge transfer performance, and patterns and structures of intra-organizational learning networks affect promote building innovative organiza-

tions. However, reliance in IT is shaping organizations' abilities to develop innovations. Supporting learners in digital environments, teachers' use of ICT, and individual, social and organizational factors influence ICT-based workplace learning. To control some of the challenges of ICT-based innovation organizations, be they public or private, should be mindful of the mechanisms and benefits of disseminating knowledge.

From an ICT readiness perspective, knowledge sharing between business organizations are based on relationships between learning-related factors and knowledge transfer performance. Low levels of skills and motivation to ICT are noted in some organizations, especially in SMEs.

Future study is recommended and planned to further deepen insights on how these four themes relate to one another. In addition, more study is recommended on the current methods of assessing the societal impacts of ICT related innovation projects, and the skills and competences needed to succeed in modern society and work life. The studies by ECHO study aim to elaborate how to achieve a framework to design methodology for conducting SIA, and E-skills and Training based on OL theory.

The main contribution of this paper is that it adds to the body of knowledge regarding OL theory, and on a more practical level, it may provide a basis for future SIA assessment methods development. Identifying on one hand, research gaps, needs and current methods of SIA of ICT related innovation projects, and on the other hand what skills and competencies are needed to succeed in modern society and work life can help create the frameworks for SIA and e-skills development for ECHO and other future innovation projects and endeavours.

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