Leading and organizing workplace learning in healthcare digital transformation: The proposal of a conceptual model

Ann Svensson [1] and Helena Vallo Hult [1, 2]

[1] School of Business, Economics and IT, University West, Trollhättan, Sweden
[3] Region Västra Götaland, NU Hospital Group, Trollhättan, Sweden

Abstract

Developing the digital health environment for the future is an important and prioritized initiative to meet increasing demands and requirements for high-quality healthcare. The digital transformation of healthcare not only entails changes in the IT environment but also affects the healthcare professionals' daily clinical work, as it includes changes that require learning and the development of new working methods. The challenges are thus both complex and sociotechnical, which calls for holistic approaches and a better understanding of existing practices and new competencies required in response to current changes associated with digitalization. In this context, workplace learning plays a vital role. This paper draws from initial experiences of a digitalization initiative at two hospitals in Sweden, which partly focuses on the management and organization of digital transformation. By studying the development, implementation, and use of digital technologies from a learning perspective, the main focus is to contribute to better knowledge about how to lead and organize workplace learning for healthcare professionals, which also benefits the patients. The aim is to identify key activities associated with learning in healthcare digital transformation. Hence, we propose a conceptual model that illustrates and exemplifies activities and roles related to learning through digital change. In conclusion, we argue that a better understanding is needed of i) how management and organization can facilitate change in working methods and related processes, and ii) how learning in everyday work can be integrated with digital transformation in order to achieve the full potential of digitalization.

1. Introduction

Developing the digital health environment for the future is an important and prioritized initiative to meet increasing demands and requirements for high-quality healthcare. Introducing new digital solutions is expected to contribute to utilizing the possibilities of digitalization and e-health. It is part of the national strategy for developing healthcare in Sweden toward the government's vision for e-health in 2025 [1]. Designing, using, and managing healthcare technologies involves complex sociotechnical challenges. Health IT research, however, has historically placed more focus on design and implementation, rather than on how clinical end users react to already implemented IT [2]. The understanding of existing practices is therefore limited, and there is a mismatch between predicted and actual benefits of health information systems [3]. It is argued that established models of technology adoption may be insufficient to explaining the adoption process of new and future technologies, as the focus is placed on technology and individual users, whereas equally important aspects, such as contextual factors and social consequences of introducing new technologies, are backgrounded or ignored [4, 5].

The digital transformation of healthcare not only entails changes in the IT environment but also affects the healthcare professionals' daily clinical work, as it involves changes that require learning and development of new working methods. A sociotechnical perspective considers multiple dimensions of IT and learning, and is therefore considered especially important for the study of technology use in complex, diverse, and dynamic work settings [4, 6]. In order to gain the best possible benefits of the new healthcare information environment, activities need to be managed and organized to be able to shape standard processes and working methods. Previous research has identified and outlined challenges and knowledge critical to the digitalization of healthcare [6-8]. How the digital transformation is lead and organized has proven to significantly influence to what extent the digitalization leads to improvements and efficient provision of healthcare [9]. The sociotechnical,

holistic approach to learning is also essential to better understand and support strategies undertaken by healthcare professionals as they navigate and interact with both people and technologies in emerging digital learning environments [10, 11]. In this context, workplace learning—defined as the integration of theoretical and practical knowledge and experiences across educational as well as work-life and civil society contexts [12]—plays a vital role.

Adopting a sociotechnical perspective on IT and learning, this conceptual paper draws from initial experiences of the Health Information Environment of the Future (HIEF) initiative; a digitalization initiative at two hospitals in Sweden that partly focuses on the management and organization of the digital transformation. For the purpose of this paper, we have chosen to focus on real-time documentation as a use case to illustrate and exemplify activities and roles related to learning through digital change. Real-time documentation is a new feature that is being introduced as part of the larger project. The availability of relevant documentation requires that the healthcare professionals know the systems. Consequently, the technologies used need to support work processes in a standardized way. In line with previous research on digitalization and workplace learning, we are interested in identifying opportunities and barriers that arise within management and organization in relation to the digitalization of working methods [9, 13]. A specific focus is placed on changes to professionals' roles and responsibilities, and the new demands these changes pose for competence and learning [14, 15]. The project as a whole follows agile methodology, which means that the project is divided into phases, and that new digital technologies and systems are introduced iteratively, and in phases, in the digital health information environment of the future. This approach makes it possible to take advantage of experiences from the transition at one hospital to shape new processes and working methods and support learning across organizational boundaries over time. Against this background, the main focus of this paper is on leading and organizing that stimulates workplace learning in everyday work for healthcare professionals and contributes to increased patient benefit. The aim is to identify key activities associated with learning through digital change, and the research question is: *How can learning activities in digital change processes be conceptualized and understood?*

2. Theoretical background

Working life has become increasingly complex and ever-changing, placing higher demands on continuous learning and continuing education. In healthcare, like other knowledge-intensive sectors, employee competence and development are among the most important cornerstones. Having previously primarily focused on the individual, and on formal education and training outside of the workplace, competence development and learning today is just as much about raising or broadening the competence of working groups at individual, group, and organizational levels [16]. Research and theories on learning at work have developed correspondingly over the years to include formal and informal learning in both working life and higher education.

Thus, the healthcare sector is an area where digital transformation requires that professionals acquire and develop new competences [17]. Digitalization and e-health involve using digital healthcare tools and require that the users are able to share information and communicate digitally, with the aim to promote and maintain health in the population. Digital transformation places high demands on healthcare professionals to learn and adjust the working methods. Previous research on professionals' perceptions about digital technology has mostly focused on benefits for the organization rather than improvements in professional practice and learning in practice [18]. At the same time, contextual factors—such as peer support, leadership, time and resources for training, along with technological and organizational aspects—have been identified as significant to how healthcare professionals understand and use digital technologies [6, 19]. Prior research has highlighted the importance of sociotechnical approaches in understanding the interdependencies among technologies, people, and work practices [20], especially in healthcare, given the complex and dynamic nature of healthcare information systems [21]. Sociotechnical thinking includes stakeholder participation, co-creation, and co-development, and is important in meeting current challenges in the context of work [22, 23]. The perspective plays a special role in healthcare, since active involvement of healthcare professionals as well as patients are highlighted as key elements in the co-design process [24, 25].

Workplace learning is considered essential to meet the growing demands for new competencies required in response to rapid work-life changes [26]. Researchers have variously theorized workplace learning with focus on interactive elements (learning from others, e.g., collaboration) and task-based learning (learning through experiences and reflections) across different occupations and contexts [27]. As highlighted in recent research, theories and frameworks based on traditional learning models are less suitable for reflecting on professional practices and learning associated with digitalization of the work, which instead requires new forms of learning [13, 28].

This study takes its point of departure from the practice-based workplace learning literature, which finds no separation between work and learning. In other words, people learn as they engage and interact with each other, and with digital technologies, in the workplace [29]. This perspective considers workplaces as essential learning environments for professional practices that generate potentially important learning in its own right [30, 31]. Consequently, it is central to understand workplaces as learning environments and how workplaces afford learning opportunities, as this impacts how individuals elect to engage in learning activities [32]. The workplace needs to afford opportunities for individuals to participate in everyday learning activities at work, as work and learning is integrated [33]. To engage in daily work activities hence means to be engaged in ongoing learning at the workplace. Therefore, the managers' readiness to lead and organize workplace learning activities is vital. Guidance and leadership from the managers is a basis for how individuals and groups enact workplace learning, together with the work-related knowledge of the professionals [8], their values, and how they elect to engage in workplace activities [32]. Transformation involving the implementation of digital systems requires a mutual adaption between the digital systems, the particular workplace, and its practices [30]. Innovation at work is premised on, and contributes to, the professionals' learning. As such, *"there is a co-occurrence and interdependence between innovation and learning at and through work*" [34, p. 222].

The workplace learning perspective aligns with the sociotechnical approach, as it addresses the dynamics of people's interactions with each other and technology in a situated context, where learning is intertwined when working methods are changing at the same time as they are digitalized. This perspective contrasts with more reductionist perspectives that view learning as the transfer of knowledge or technology as the cause of change. In all, adopting a sociotechnical and workplace learning standpoint provides a holistic perspective on the analysis of digital healthcare, as well as on the demands for new competencies and changing conditions for learning that emerge in this new context.

3. Research context

The empirical setting is the digital changes and challenges related to working and learning in the context of the Swedish healthcare sector. The project is based on an engaged research approach that aims for collaboration between research and practice for the benefit of all involved stakeholders [35]. For the participating hospitals, the engagement in the project means that the research will be implemented to develop and improve healthcare, at the same time as participation in activities such as workshops is expected to contribute to development and learning for participating stakeholders at both individual and organizational level. The goal is also to generate knowledge exchange and new perspectives across organizational boundaries through collaboration in data collection activities for research and business development.

The project is connected to the HIEF project; an ongoing digitalization initiative and transformation approach to healthcare in the second largest of the 21 regions in Sweden. This region, Region Västra Götaland, has about 1.75 million inhabitants. The HIEF project envisions the implementation of a modern healthcare information environment that provides the inhabitants with accessible and inclusive healthcare of high quality.. Such an implementation includes managing and organizing the digital transformation at hospitals, primary care centers, and municipalities in the region. As all professions at the hospitals are affected, it is vital to understand how digitalization affects and changes the work. The HIEF project has a clear structure and intends to standardize working methods within healthcare.

One particular area within the larger HIEF project is real-time documentation, i.e., documentation made in a patient record during or in close connection with a consultation or other interaction with

healthcare. The self-monitoring that patients do is also included in the real-time documentation. Real-time documentation is already used in healthcare today and will be scaled up along with the increasing digitalization of healthcare at large. Real-time documentation affects the healthcare professionals' established ways of working before, during and after all clinical encounters with patients. From a patient perspective, real-time documentation can be beneficial as it provides new possibilities, but risks and challenges are also involved.

Dialogue meetings, conducted at one of the hospitals as part of the HIEF project, revealed common benefits and challenges associated with real-time documentation from a patient perspective. Important advantages highlighted by patients are 1) more comprehensible patient record entries, 2) less need for repeating information as medical records from previous meetings can be revisited, and 3) access to patient record information during the consultation, which provides opportunities for reflecting, giving feedback and asking questions in connection with the patient meeting. Perceived challenges and risks include, for instance, that 1) the patients cannot decide whether they want to have access to all documentation and, if so, how, and 2) the meeting is characterized by the staff following a pre-structured template in the medical record at the expense of more free-flowing social talk, increasing the risk that certain parts that the patients consider important are missed. The patients also expressed the opinion that consolidated medical records should not be mandatory, as it is not always desirable to make all information available to everyone.

4. Leading and organizing digital transformation

Digitalization requires that the healthcare professionals work task-based, i.e., by placing digital orders that describe what needs to be done, and by whom. The professionals hence both need to learn and unlearn, as the work is redesigned. In this way, the care process is carried forward. Thus, each professional is both a producer and a consumer of documentation. Leading and organizing the digital transformation presupposes workplace learning in hospital organizations, where people with different professions collaborate to exchange knowledge and experiences. How the management and organization can anchor this perspective is an important goal in the introduction and implementation, which calls for the sociotechnical perspective.

This research is based on an identified need to develop theories and models for workplace learning that focus on the management and organization of changing working methods and processes and support new evolving work processes and learning in the everyday clinical practice. We argue that it is necessary to investigate how to provide the best conditions to bring about learning in this transformation. Therefore, it is important to include learning aspects already in the change process in the preparation and implementation phase, and build resilient structures and processes between and within professions that last beyond the introduction. Knowledge exchange between professions is a prerequisite, and workplace learning models will be developed and tested.

In the exploratory phase of this project, it is important to identify the different roles and tasks in each of the planned activities. As seen in Figure 1 below, the roles are important in each of the six phases. All professions in the healthcare organization are affected by the implementation of the new health information environment with its the various platforms, systems, and applications. Therefore, it is important to study how digitalization affects and changes work practices for all roles. We also need to investigate how to create the best conditions for learning in this transformation for all the different roles. Consequently, it is essential to achieve this in the change process already in the preparation and implementation phase of the HIEF project and build structures and processes both between and within professions that last after the implementation from program to operation, in the short and long term.
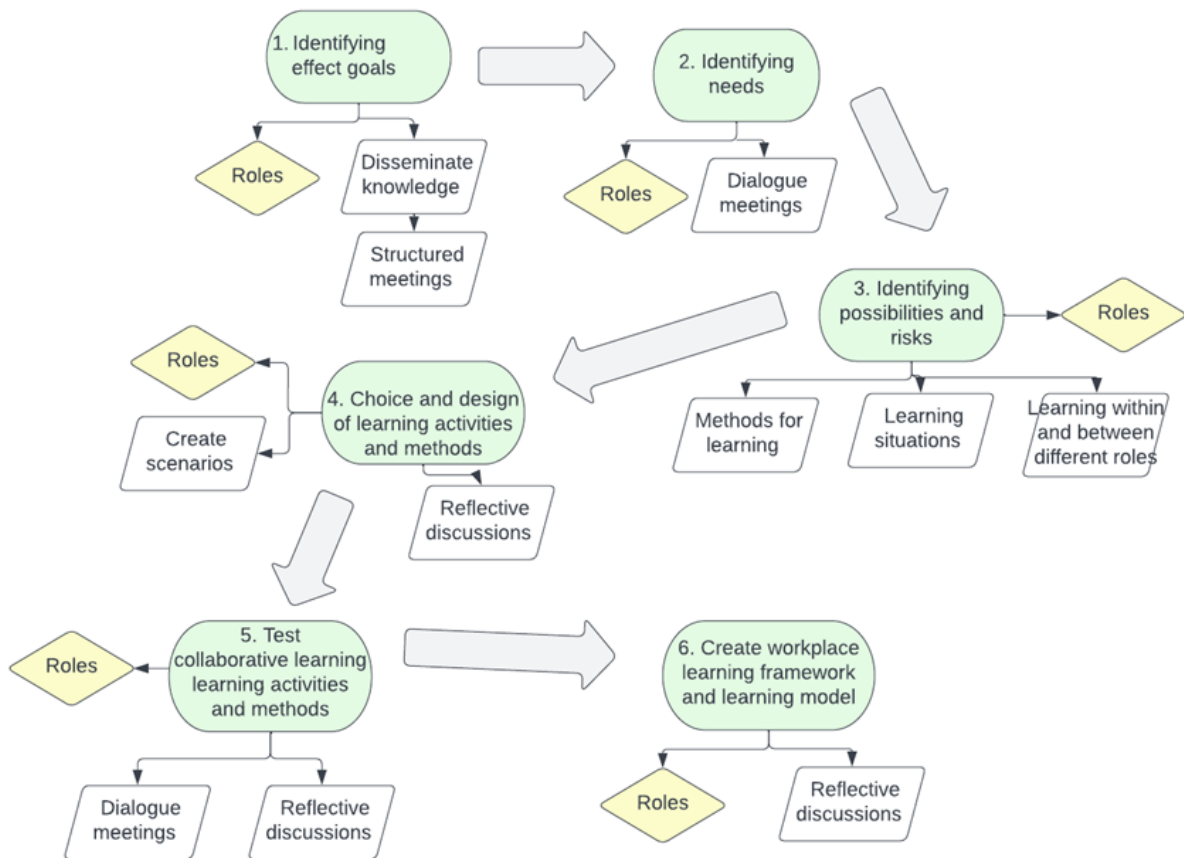
Figure 1: Conceptual model/study protocol

The first activity (1) is *identifying the effect goals* and disseminating this knowledge in the organization. Here, structured meetings with focus group interviews will be conducted, where the professionals will have the opportunity to establish a common ground and get an overview of the basic principles underpinning the HIEF implementation. The second activity (2) is to *identify the needs* for collaborative learning, such as where the learning takes place, who is learning in different situations, and how the learning could take place. This activity will be supported by identifying rich learning activities and situations for learning. Dialogue meetings and focus group interviews will be conducted, where healthcare professionals and researchers will reflect and collaborate democratically as peers to develop shared conceptions on rich learning activities [36]. The third activity (3) is to *identify possibilities and risks*. Here, methods for learning will be discussed in focus group interviews, in relation to learning situations and learning within and between different roles and professionals. The fourth activity (4) is *choice and design of learning activities and methods*. In this activity, learning scenarios will be created and reflectively discussed in focus groups that include healthcare professionals and researchers. Here, the basic principles for a collaborative learning framework will be outlined. The fifth activity (5) consists of *tests of collaborative learning activities and methods*. This activity will focus on scenarios in everyday work. Dialogue meetings and reflective discussions in focus groups will take place to further refine the learning activities and methods. The sixth and final activity (6) is to *create the workplace learning framework and learning model* associated with the implementation of the HIEF project. The framework will constitute a basis for providing the best conditions to bring about learning in this healthcare transformation.

151

5. Project contributions and next step

Digital transformation of healthcare is a broad issue related to the societal challenges of sustainable community building and precision health. The project aims to identify different types of learning associated with fundamental change, creation of new knowledge structures, incremental changes in the existing knowledge structures, as well as validation and reinforcement of existing knowledge structures [33]. The developed workplace learning framework and learning model will be used in the healthcare practice to implement new working methods in parallel with the implementation of the HIEF. The focus will initially be on the use case described here, i.e., real-time documentation, and subsequently on other digital transformation processes in healthcare. The learning types need to be considered in order to identify in which activities different learning types are of vital importance. This is also important to recognize in order to create a sustainable and continuous learning environment in healthcare that contributes to increased patient benefit.

First, the project contributes to an *equal society* by managing and organizing new community initiatives. Healthcare services must be available to all people regardless of age, gender, place of residence or origin, or ethnicity. This research contributes to a better understanding of how healthcare can develop improved services and support people in need of hospital care. The future health information environment can facilitate communication and contact between patients and hospitals (and other healthcare providers) and includes innovations based on society's needs.

Second, the project contributes to the societal challenge of *sustainable precision health*. Society's health challenges are complex and driven by demographic changes, economic realities, increased individual focus, and technological development. At the same time, all people need to be treated as equals and given equal opportunities without discrimination. New technical opportunities and digitalization create opportunities for staff to support their work-related health and well-being in a sustainable way. Therefore, the sociotechnical perspective is important. Digitalization also increases and streamlines access to healthcare for the general population, as well as for patients in care. This project hence contributes to creating conditions for healthcare professionals to be more involved in their work situation and, with the support of digital technologies, develop their working methods and skills.

6. Conclusion

In this paper, we have addressed a need to develop theories about workplace learning for management and organization to support new and changing work processes and learning in healthcare professionals' everyday work. By studying the development, implementation, and use of digital technologies from a learning perspective, we need to focus on the management and organization of changing working methods and processes. The paper contributes to better knowledge about how to lead and organize workplace learning for healthcare professionals in order to create better conditions for achieving the impact goals of the digital transformation. By researching the digital transformation process while considering the interplay between technical and social aspects in the work context, we want to gain knowledge and increased understanding of management and organization, to be able to integrate changing work processes and learning in the everyday work. This means that we need to gain more knowledge about i) how management and organization can facilitate change in working methods and related processes, and ii) how learning in everyday work can be integrated with digital transformation in order to achieve the full potential of digitalization.

7. Acknowledgements

References

[1] The Swedish eHealth Agency: Better health and health care with e-health, 2022. URL: https://www.ehalsomyndigheten.se/om-oss/vision-e-halsa-2025/.

[2] R. J. Holden, B.-T. Karsh, "The technology acceptance model: its past and its future in health care," Journal of biomedical informatics, vol. 43, no. 1, pp. 159-172, 2010.

[3] T. Greenhalgh, H. W. Potts, G. Wong, P. Bark, D. Swinglehurst, "Tensions and paradoxes in electronic patient record research: A systematic literature review using the meta-narrative method," The Milbank Quarterly, vol. 87, no. 4, pp. 729-788, 2009.

[4] D. F. Sittig, H. Singh, "A new sociotechnical model for studying health information technology in complex adaptive healthcare systems," Quality and Safety in Health Care, vol. 19, no. Suppl 3, pp. i68-i74, 2010.

[5] R. Sharma, R. Mishra, "A review of evolution of theories and models of technology adoption," Indore Management Journal, vol. 6, no. 2, pp. 17-29, 2014.

[6] H. Vallo Hult, A. Hansson, M. Gellerstedt, "Digitalization and Physician Learning: Individual Practice, Organizational Context, and Social Norm," Journal of Continuing Education in the Health Professions, vol. 40, no. 4, pp. 220-227, 2020.

[7] A. Svensson, "Challenges in Using IT Systems for Collaboration in Healthcare Services," Int J Environ Res Public Health, vol. 16, no. 10, May 20, 2019.

[8] A. Svensson, L. Bergkvist, C. Bäccman, S. Durst, "Challenges in implementing digital assistive technology in municipal healthcare," Management and Information Technology after Digital Transformation, pp. 81-90: Routledge, 2021.

[9] C. Gjellebæk, A. Svensson, C. Bjørkquist, N. Fladeby, K. Grundén, "Management challenges for future digitalization of healthcare services," Futures, vol. 124, pp. 102636, 2020/12/01/, 2020.

[10] H. Vallo Hult, A. S. Islind, C. Master Östlund, D. Holmgren, P. Wekell, "Sociotechnical Co-design with General Pediatricians: Ripple Effects through Collaboration in Action," in AMCIS, Salt Lake City, UT, USA 2020.

[11] H. Vallo Hult, C. Master Östlund, "Towards Design Principles for the Three Phases of Physicians' Information Seeking Activities." pp. 65-70.

[12] S. Billett, "Realising the educational worth of integrating work experiences in higher education," Studies in Higher Education, vol. 34, no. 7, pp. 827-843, 2009.

[13] H. Vallo Hult, Digital Work : Coping with Contradictions in Changing Healthcare, Trollhättan: University West, 2021.

[14] H. Vallo Hult, K. Byström, "Challenges to Learning and Leading the Digital Workplace," Studies in Continuing Education, 2021.

[15] H. Vallo Hult, A. S. Islind, L. Norström, "Reconfiguring professionalism in digital work," Systems, Signs & Actions, vol. 12, no. 1, pp. 1-17, 2021.

[16] P. Hager, "Theories of Workplace Learning," The SAGE Handbook of Workplace Learning, 2, M. Margaret, C. Len and E. Karen, eds., SAGE Publications Ltd, 2011.

[17] E. Topol, "Preparing the Healthcare Workforce to Deliver the Digital Future the Topol Review: An Independent Report on Behalf of the Secretary of State for Health and Social Care," NHS Health Education: London, UK, 2019.

[18] M. B. Watson-Manheim, S. Klein, "Conceptualizing Hidden Human Work in a Technology Intensive Work Environment," in OCIS 2019: Change Management, AI and Social Media., 2019.

[19] J. Konttila, H. Siira, H. Kyngäs, M. Lahtinen, S. Elo, M. Kääriäinen, P. Kaakinen, A. Oikarinen, M. Yamakawa, S. Fukui, M. Utsumi, Y. Higami, A. Higuchi, K. Mikkonen, "Healthcare professionals' competence in digitalisation: A systematic review," Journal of Clinical Nursing, vol. 28, no. 5-6, pp. 745-761, 2019.

[20] M. H. Jarrahi, K. Crowston, K. Bondar, B. Katzy, "A pragmatic approach to managing enterprise IT infrastructures in the era of consumerization and individualization of IT," International Journal of Information Management, vol. 37, no. 6, pp. 566-575, 2017/12/01/, 2017.

[21] T. Greenhalgh, D. Swinglehurst, "Studying technology use as social practice: the untapped potential of ethnography," BMC medicine, vol. 9, no. 1, pp. 45, 2011.

[22] P. Bednar, M. Sadok, "Bridging the Gap Between Theory and Practice: Socio-Technical Toolbox," Lecture Notes in Information Systems and Organisation, Empowering Organizations, pp. 51-62, Cham: Springer International Publishing, 2016.

[23] P. M. Bednar, C. Welch, "Socio-Technical Perspectives on Smart Working: Creating Meaningful and Sustainable Systems," Information Systems Frontiers, vol. 22, no. 2, pp. 281-298, 2020/04/01, 2020.

[24] H. Vallo Hult, A. S. Islind, K. Rydenman, P. Hällsjö Wekell, "Decreased Memory Bias via a Mobile Application: A Symptom Tracker to Monitor Children's Periodic Fever," Stud Health Technol Inform, vol. 294, pp. 915-919, May 25, 2022.

[25] A. S. Islind, H. Vallo Hult, V. Johansson, E. Angenete, M. Gellerstedt, "Invisible Work meets Visible Work: Infrastructuring from the Perspective of Patients and Healthcare Professionals," in HICSS, January 5-8, 2021.

[26] P. Tynjälä, "Perspectives into learning at the workplace," Educational Research Review, vol. 3, no. 2, pp. 130-154, 2008/01/01/, 2008.

[27] I. Nikolova, J. Van Ruysseveldt, H. De Witte, J. Syroit, "Work-based learning: Development and validation of a scale measuring the learning potential of the workplace (LPW)," Journal of Vocational Behavior, vol. 84, no. 1, pp. 1-10, 2014/02/01/, 2014.

[28] A. Reich, D. Rooney, D. Boud, "Dilemmas in continuing professional learning: learning inscribed in frameworks or elicited from practice," Studies in Continuing Education, vol. 37, no. 2, pp. 131-141, 2015.

[29] S. Billett, "Learning in the circumstances of practice," International Journal of Lifelong Education, vol. 33, no. 5, pp. 674-693, 2014.

[30] S. Billett, "Critiquing workplace learning discourses: Participation and continuity at work," Studies in the Education of Adults, vol. 34, no. 1, pp. 56-67, 2002.

[31] S. Billett, "Workplace participatory practices: Conceptualising workplaces as learning environments," Journal of workplace learning, vol. 16, no. 6, pp. 312-324, 2004.

[32] S. Billett, "Learning through work: workplace affordances and individual engagement," Journal of workplace learning, vol. 13, no. 5, pp. 209-214, 2001.

[33] J. Lave, "The practice of learning," Understanding practice: Perspectives on activity and context, S. Chaiklin and L. J., eds., pp. 3-32: Cambridge University Press, 1993.

[34] S. Billett, S. Yang, A. Chia, J. F. Tai, M. Lee, S. Alhadad, "Remaking and Transforming Cultural Practices: Exploring the Co-occurrence of Work, Learning, Innovation," Creativity and Learning: Contexts, Processes and Support, S. Lemmetty, K. Collin, V. P. Glăveanu and P. Forsman, eds., pp. 219-244, Cham: Springer International Publishing, 2021.

[35] L. Mathiassen, P. A. Nielsen, "Engaged scholarship in IS research," Scandinavian Journal of Information Systems, vol. 20, no. 2, pp. 1, 2008.

[36] K. Grundén, A. Svensson, B. Forsman, C. Karlsson, A. Obeid, "Dialogue meetings as an arena for collaboration and reflection among researchers and practitioners in a pre-study of a welfare technology testbed," International Journal of Engineering Management and Economics (IJEME), vol. 14, no. 8, pp. 629-634, 2020.