

The Impact of Leadership on Digital Learning in Health

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Abstract: Leaders have a key responsibility in providing employees with the necessary knowledge and training so that they can carry out their work. At the same time, advances in technology, changes in demographics, increased demands on health services and rapid developments of health professions are all elements that contribute to a particularly enhanced demand for upgrade of employees' competences. The role of leadership in meeting these demands and developing competence in health is limited. This is particularly true for competence development through the use of digital tools. Through a structured search in the Social Citation Index and the Science Citation index (in Web of Science) we review past research and develop key insights that address how leadership can be linked to digital learning within health. In particular, we use a relevant and extensive set of search terms in the areas of nursing and health, leadership, knowledge development and digital learning. A key finding from this search was the lack of existing research, which suggests that more research and broader structured searches are needed. This is particularly imminent following the covid-19 pandemic, which has demanded the digitalisation of many fields where education and health have had to undertake considerable changes. We identified three main core stakeholders relative to whom leadership is essential in understanding its impact on digital learning: patients, students and health professionals. Further, results pointed to learning effects as well as barriers and enablers of effect as key dimensions that leaders need to understand and consider. Underlying any effect of leadership and digital learning initiatives are modern tools of technology, including the right information, system and support that enhances resource efficiency. Finally, the leadership effect on learning is context dependent and related to culture, motivation, reflection, behaviour and digital competence.

Keywords: health, nurse, leadership, learning, competence, digital

1. Introduction

Successful digital transformations, where digital technology is used to fundamentally change the value creation logic of an organisation for the better, more profitable and sustainable, demand leadership and that organisations have the right capabilities (Westerman et al, 2014; Weber, Büttgen and Bartsch, 2022). Such transformations imply that leaders understand digital solutions, their application as well as their value. During Covid, many organisations have been forced to apply and use digital solutions that to a limited degree have been utilised optimally for strategic long-term value creation. Going forward it seems particularly essential to understand how digital tools can be applied for long term benefits in organisations. Also, gaining insights on the dimensions of leadership that is essential in enhancing the use of digital tools seems particularly important.

In looking at literature about transformational leadership (Bass & Avolio, 1994), four dimensions have been pointed out as particularly essential: idealised influence through leading by example, intellectual stimulation through learning, inspirational motivation by inspiring to greater heights and individualised consideration through coaching. In stimulating digital transformation, knowledge and learning is essential. Digital learning tools are core resources in most organisations and are often crucial to employees' knowledge development. By studying the use of digital learning tools as such, it is possible to both understand the relevance of leadership for learning, but also to study the direct implication of the development of transformational capabilities in organisations. The utilisation of these tools is in many cases far below their potential.

Digital solutions can enhance value creation in many organisations and sectors, but particularly so in health (Ruggeri et al, 2013). An important challenge facing leaders in this context, is to integrate human and information technology systems into the organisation in a way that provides maximum benefits (Avolio et al, 2000). Developing insight into the role of leaders in enabling benefits and enhancing digital learning is essential for the future of health. In this paper, we want to contribute to a more in-depth understanding of the knowledge sub-dimensions of transformational leadership and the impact of leadership on employee learning in health organisations. In particular, we ask the following research questions:

1. What trends can be identified in the field of health when it comes to the role and impact of leadership on digital learning?
2. What are the main topics in developing a conceptualization of leadership in digital learning?

To answer these questions, we first introduce key theoretical perspectives on leadership in the health sector. In turn, we carry out a structured literature review. Finally, we present our findings and potential avenues for future research in an integrated model and a concluding discussion.

2. Theoretical background

In understanding the role of leadership in digital learning, we know more generally that leadership has an extensive impact on knowledge management in organisations (Nguyen & Mohamed, 2011). However, it is only over the last couple of decades that research has started looking at more specific roles and styles of leadership and its impact on knowledge management in organisations (e.g., Donate & De Pablo, 2015). These latter authors combine transformational and transactional leadership styles to propose a knowledge-oriented leadership style, which can be positively associated with knowledge management behaviour (Shamim, Chang & Yu, 2019). Donate and Sanchez de Pablo (2015) describe knowledge-oriented leadership as a mix of transformational and transactional leadership. In particular, they combine motivating and inspiring leadership with clear incentives. In practice, knowledge-oriented leaders guide employees to see the value of their work, while at the same time communicating clear expectations, eliminating barriers and clarifying the organisation's goals. This type of leadership also incorporates motivational elements such as opportunities for career development, increased responsibility and material rewards. Knowledge-oriented leadership is mentioned by many researchers as crucial in developing innovative organisations (e.g. Men & Jia, 2021; Donate and de Pablo, 2015; Ribiere and Sitar, 2003).

Health care organisations change constantly, have challenges in recruiting and retaining qualified employees, demand operations 24-hours a day, extensive delegation and limited team continuity (Vesterinen et al. 2013). This reinforces the importance of the health workers' competence, the need for replenishment of new knowledge and skills to be able to handle their work and suggests that digital learning is particularly suited (Fahlman 2012). In handling this, research suggests that health leaders most often use a democratic, affiliated, visionary or coaching leadership style, while they rarely use a commanding and isolating leadership style (Vesterinen et al, 2013). Another study concluded that affiliated and coaching leadership styles to be common (Kenmore, 2008). Thus, health offers an interesting extreme context to study leadership of digital learning solutions.

Understanding how leaders impact digital learning in organisations, Vermeulen et al (2015) suggest that the relationships are indirect, in the sense that leaders impact the employees feeling of mastery and attitudes, which in turn impact the intention to use digital tools. In a later study, Vermeulen et al (2017) further found that the learning climate in the form of collective reflection, tolerance for different opinions, and learning from mistakes also have an effect. Beyond these initial findings, limited research has been done to study how leadership impacts and can facilitate the use of digital learning tools in organisations. Thus, the main aim of the study below is to integrate findings from a particular sector in developing insight into existing research on the relationship between leadership and the use of digital learning tools in organisations.

3. Method

As the current study aims to review existing research on leadership of digital learning in health, we have adopted an inductive approach and used both quantitative and qualitative methods. This approach has allowed us to develop a solid understanding of how the research that integrates the areas of health, leadership and digital learning has developed. This method has also enabled us to tease out dominant themes of the identified articles, as well as potential avenues for future research.

3.1 Data collection and compilation

Systematic literature reviews typically go through three phases: planning, i.e., identifying the research question and defining boundaries; conducting, i.e., searching for and analysing relevant literature; and reporting, i.e. formalising the findings and developing implications (Tranfield et al, 2003). The first two phases will be described here, while the third phase, reporting, is described in the Findings section.

In the planning phase, we first formulated our research questions. We then defined the boundaries of our study to include academic articles published in the period up to 2022 in journals listed in Science Citation Index Expanded and Social Sciences Citation Index. These were chosen as they cover a broad range of journals in the fields of social science and technology. To produce a broad presentation of the impact of leadership on digital

learning in health, a systematic literature review was used. The search terms and the search field used can be found in table 1. An overview of the process used can be found in the flow-chart in Figure 1.

Table 1: Search terms/groups

Search in title	Search in abstract	Search in all fields	Number of papers	
nurse* OR health* AND learning OR knowledge OR "knowledge management" OR competence AND elearning OR e-learning OR "computer-based learning" OR "computerbased learning" OR "computer based learning" OR "digital learning" OR digital			309	
nurse* OR health* AND learning OR knowledge OR "knowledge management" OR competence AND elearning OR e-learning OR "computer-based learning" OR "computerbased learning" OR "computer based learning" OR "digital learning" OR digital	Leadership OR management		38	Keyword: 2 leadership 36 management
nurse* OR health* AND learning OR knowledge OR "knowledge management" OR competence AND elearning OR e-learning OR "computer-based learning" OR "computerbased learning" OR "computer based learning" OR "digital learning" OR digital		Leadership OR management	69	Keyword: 5 leadership 65 management
nurse* OR health* AND learning OR knowledge OR "knowledge management" OR competence AND elearning OR e-learning OR "computer-based learning" OR "computerbased learning" OR "computer based learning" OR "digital learning" OR digital		Leadership OR management	61	Deleted document types: meeting abstract and editorial material

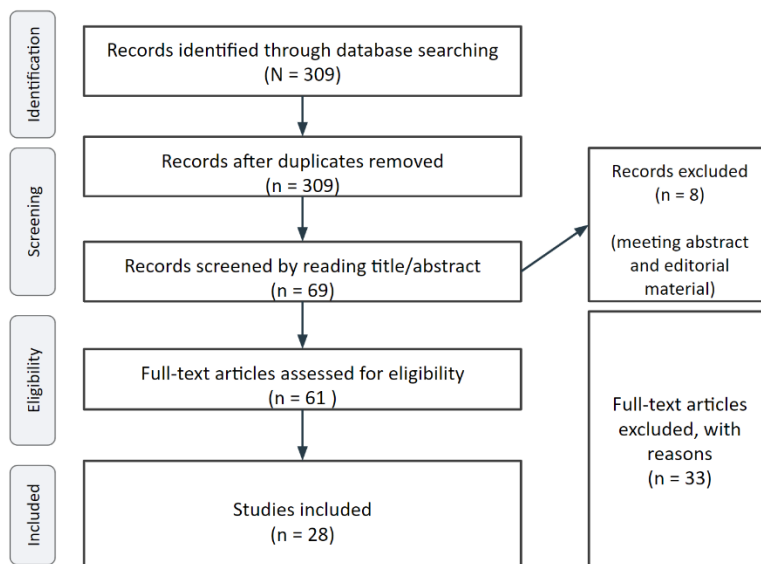


Figure 1: Flowchart of systematic review

61 papers were addressed for eligibility. These were grouped into three categories related to the learning subjects: Students-Educators, Patient-Relatives-Public Health and Health professions. 28 articles dealt with health professions, which was the topic we chose to study. The time frame of the study included publications up to and including the year 2021. An overview of the core search over time can be found in figure 2.

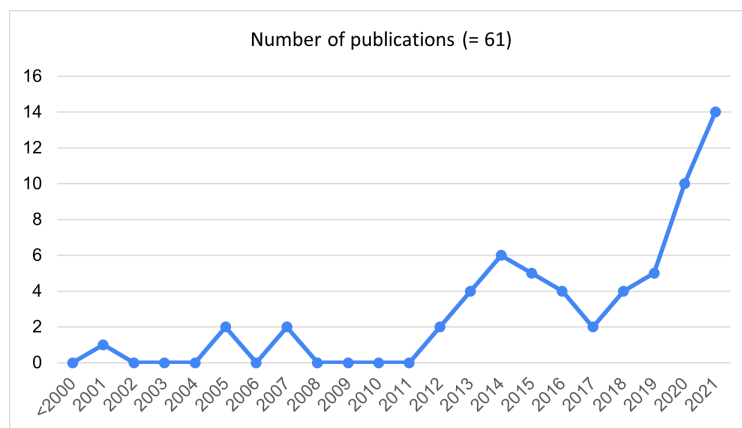


Figure 2: Historical overview of studies for search (described in figure 1)

4. Findings

The literature search intended to provide an overview of articles dealing with leadership of digital learning in health services up to and including the year 2021. We wanted to look more closely at the role, importance, and nature of leadership in digital learning. Many of the identified papers were written in 2020 and 2021, which suggest an increased relevance of this topic during the pandemic. We found that the leadership of digital learning related to different stakeholders, which is essential for developing an in-depth understanding of leadership. Beyond these stakeholders, we found that the papers could be separated into 5 main themes: (1) Effect of learning technology, (2) Barriers and enablers to success, (3) Leadership and management, (4) Modern technology, in addition to (5) Other. The other category included a wide and diverse set of papers and will not be covered in the following.

4.1 Stakeholders of learning leadership

In understanding leadership in digital learning, the literature study showed the relevance of understanding the stakeholder and learning subjects. Most of the identified studies discussed the use of digital learning among health professionals (28), students and educators' use in teaching contexts (19), and patients and their relatives (14), where e-learning was used to create knowledge and mastery of illness together with digital learning in the field of public health. Health professions rather than patients are central to our research, which concern the health organisations as such. Still, identifying these different stakeholders seems essential for leadership of digital learning.

4.2 Key themes of leadership in digital learning in health

Based on the qualitative and iterative content analysis, four main research themes were identified: (1) the effect of learning technology, (2) barriers and key factors for success, (3) leadership and management, and (4) modern technology. Some studies included two themes, these publications are listed under both categories below in Figure 3, where the publications are shown over time. Each theme is described in more detail below.

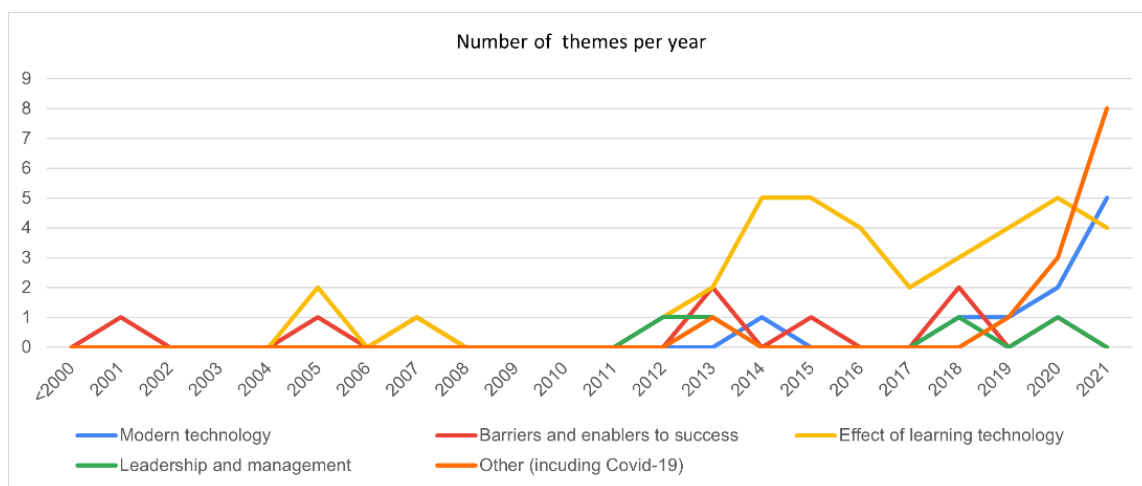


Figure 3: Overview of identified research themes over time

4.2.1 Effect of learning technology

Over the years, several studies have examined the effect of using digital learning. This applies to both health professional education and health organisations.

Digital learning can be defined as the technical solution used to support teaching (Suhonen, 2005; Basak et al, 2017). Examples of this are digital learning tools, online study programs and online learning resources. Digital learning is a term that is increasingly used about the use of information and communication technology in teaching. E-learning (Electronic learning) and m-learning (Mobile learning) overlap, and both can be seen as subgroups of digital learning. (Basak et al, 2017).

Different studies show different results, but they often conclude that digital learning programs are far more effective than no training and as effective as traditional teaching (Ruggeri et al. 2013; George et al. 2014). Wang et al. (2021) point out that few studies have explored the effectiveness of e-learning tools for health care

providers. They conclude that both clinicians and primary health care professionals improved their knowledge with e-learning activity in continuing medical education.

In measuring effect, a study of the relationship between nurses' satisfaction with the use of e-learning showed that satisfaction was related to information quality, system quality, support service quality and instructor quality and that this contributed significantly to perceived benefits, confirmation and flow (Cheng, 2014). The nurses' satisfaction with the use of a mixed e-learning system led to their continued intention to use the system. Standsfeld et al. (2015) investigated the feasibility, adherence, and probable effectiveness of using e-learning for managers. They found a small benefit of the intervention on well-being that was positively related to the use of the mixed methods in learning.

There is a wide range of alternative measures of effectiveness in the identified papers, and extensive more research is needed in these areas to clarify concepts, and in particular with regards to the effect of leadership to enable and support learning effects.

4.2.2 The potential of modern technology

New digital tools and digital technologies already offer unique opportunities for health research, but it has not yet been widely recognized as an important factor for sustainable workplace improvement (Ellis et al. 2021). While the potential of modern technologies is addressed, the real role of leadership in making this happen is treated to a limited degree. For example, Chandrasekaran et al (2014) describes e-learning as a cutting-edge tool for refining doctors' knowledge, attitudes, and practice using module-based e-learning courses combined with skills training in practice in neonatal medicine in India. The benefits described was to save resources, where uniform standardised learning and the possibility to effectively spread learning to many participants, was emphasised.

Further, Sheikh et al. (2021) concluded that robotics and artificial intelligence have the potential to improve both the quality and efficiency of health and care delivery in the UK, but that it also provides unique opportunities for health research and policy development. They however also address the leadership responsibility to ensure that there is room to learn from past mistakes and adapt digital tools to local needs and contexts. Organisations facing digitisation processes need to develop the right skills and capabilities to support employees so that leaders can aim for the best outcomes. In such a process, the focus is not on digital skills but on the leadership and change management skills needed to be present to achieve the desired effect. An open culture, varied knowledge of employees used where the need arises, willingness to innovate, a culture that welcome feedback and seek constant improvement is something that managers should strive for if they are to achieve the potential that lies in the digitalisation of organisations (Sheikh et al, 2021).

4.2.3 Barriers and enablers to success

Five papers have a special focus on barriers to and sources of success within health professions. Over 20 years ago, Herrin (2001) addressed the responsibilities of leaders and encouraged them to familiarise themselves and understand how technology will affect the future of the profession. She points out that health should use e-learning programs based on principles of adult education where employees can bring their work experiences into the learning activity. The study showed that nurses who learn to solve real patient problems through their e-learning experience will continue to use such learning tools. Herrin addresses the leadership challenge that arises when nurses do not see a clear benefit from using e-learning and therefore become sceptical of implementation and use. To meet employees' personal learning needs, nurse executives need effective ways to further develop and assess the organisation's knowledge.

Ruggeri et al. (2013) refer to a large number of previous studies that examined e-learning systems in health compared to face-to-face learning. Advantages such as convenience, availability and time are emphasised. Internal organisational challenges that were highlighted are: professional silos, static curricula and own perception of 'information overload'. In response to these challenges, e-learning provides flexible, affordable, user-centred and easily updated learning opportunities. Still, they find that the effectiveness of e-learning varies from context to context and demands the users' motivation and digital competence. They also highlighted critical success factors for e-learning as essential, such as allocation of time for training, incentives for learning, a supportive culture, information and technology support as well as an organisation that facilitates the use of e-learning.

Furthermore, Alrahbi et al. (2020) highlight the challenges of adopting health information technology in health care organisations. They point to challenges such as balancing cost and time, lack of knowledge about the benefits of the technology being introduced, insecurity about whether the investment in technology gives desired results, lack of ability in exploiting the opportunities in existing and new technology in practice, integrating new technology with existing technology, interoperability, and a culture driven by top management as key challenges. They suggest that technology must be strongly linked to the ability to create a knowledgeable organisation, a transparent environment, and informed decisions in everyday life to enable enhanced value creation.

4.2.4 Leadership and management

Childs et al. (2005) find several elements that must be adapted by the organisation and management for e-learning to be used and remain in use over time. Important elements that leaders can facilitate are to have a national approach and local strategies that are supported by the organisation's processes and procedures. They argue for a positive connection between the use of e-learning and that the people in the organisation have a strong commitment to learning, are willing to change, make evaluations during the process and integrate learning in their organisational plans. To achieve the desired effect, management support, skills training, good resource management and technical and administrative support are also needed.

Hamilton (2008) encourages transformational leadership for e-learning, where leaders share vision and values, focus on innovation and creativity, work to create an environment that is flexible and can change when needed, but also have employees who take responsibility, show respect for each other and is open to diversity (Fahlman, 2012). Health workplaces therefore need managers who support distributed management, are strategic and service-based and generate teamwork and community building, have shared decision-making, and ethical and caring behaviour (Fahlman, 2012; Neill & Saunders, 2008).

Fahlman (2012) refers to Gilmartin and D'Aunno's (2007) literature review of empirical studies of management in the health workplace for the period from 1989–2005. They point to different leadership styles being suitable for dealing with the challenges in the healthcare workplace. They concluded that participatory and person-focused leadership styles are associated with reduced work stress, increased group cohesion, empowerment and self-efficacy associated with job satisfaction and retention. She also refers to Cummings et al. (2010) systematic literature review on leadership styles in nursing from 1985–2009 which identified that a people-focused leadership practice in this context can be linked to improved results (Fahlman, 2012).

Fahlman (2012) describes different leadership and management styles and their benefits and limitations:

1. In the case of distributed management, leaders are encouraged to contribute to their knowledge and skills into the leadership community (Harris, 2004). This leadership style only works in teams where participants see the benefits and potential of such collaboration (Thornton, 2010).
2. Serving leadership requires a leadership style in which the leader takes on the role of servant rather than focusing on self-interest (Stone et al, 2003). The leader must be aware that the organisation's goals must take precedence over individuals' own goals if this leadership style is to be suitable (Sendjaya et al, 2008). Learning organisations are typically built by servant leaders (Senge, 1997). Leadership that utilises distributive leadership at the overall administrative level combined with servant leadership at the departmental level can be the critical bridge to effectively engage in the use of e-learning (Fahlman 2012).
3. Contingency leadership has leaders who strive for maximum performance among employees. They are thus dependent on the interaction between organisation, people, tasks and environment (Bolden et al., 2003). This form of leadership is suitable for monitoring small groups rather than leading learning organisations into the future (Aronson, 2001).
4. Transactional leaders base their leadership style on conditional reinforcement (Bass & Steidlmeier, 1999). Employees are motivated by positive or negative feedback. This leadership style uses control strategies and is suitable if one wants to maintain the status quo (Aronson, 2001).
5. Transformational leadership is based on collaboration between leaders and employees and where there is a shared interest in achieving common goals (Burns, 1978). Consideration for others is central and it is suitable with organisations with cultures with high ethical standards (Bass & Steidlmeier, 1999). This form of leadership is suitable in times of change (Vera & Crossan, 2004).
6. Strategic management, where planning and top-down leadership is being challenged in modern times with high complexity and increasing amounts of data (Ireland & Hitt, 2005; Floyde et al. 2013).

7. The implementation of a knowledge management base in an organisation promotes the sharing of tacit knowledge (Podgorski, 2010; Floyde et al 2013).

5. Concluding discussion

Above we used a structured literature review to develop insight concerning the role and nature of leadership in the implementation and use of digital learning in health. A key finding was the lack of existing research in this field, which suggests that more research and broader structured search seem essential. This is particularly imminent following the covid-19 pandemic, which has demanded the digitalisation of many fields, and learning in organisations due to rapidly changing conditions.

Additionally, we identified the core stakeholders relative to which leadership is essential: patients, students and health professionals. This paper aims to primarily understand health professionals. Additionally, the research pointed to learning effects as well as barriers and enablers of effect. Underlying any effect of leadership and digital learning initiatives are modern tools of technology including the right information, system and support that enhances resource efficiency. Leadership's effect on learning is viewed as context dependent and related to culture, motivation, reflection, behaviour and digital competence. These relationships are illustrated in figure 4.

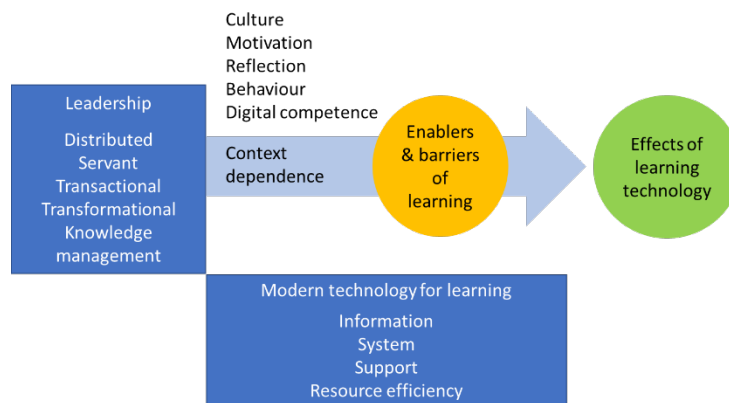


Figure 4: Integration of findings'

A number of leadership traditions have been linked to digital learning in existing research, but there seems to be limited research that has studied their impact, strengths and weaknesses, and particularly so in health. There is room for more research in this area to develop our understanding further.

The population development in many countries is moving in the direction of an increasing proportion of the elderly. The need for health services and digitalisation of health services can be a crucial contribution to improving welfare. Ensuring that effective learning tools are in place is crucial for this to happen. This article has taken a first step in developing a better understanding of the role of leadership in this development.

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