F E A T U R E   A R T I C L E

Social Challenges When Implementing Information Systems in Everyday Work in a Nursing Context

LINA NILSSON, MSc
SARA ERIKSÉN, PhD
CHRISTEL BORG, PhD, RN

Implementation of information systems in healthcare has become a lengthy process where healthcare staff (eg, nurses) are expected to put information into systems without getting the overall picture of the potential usefulness for their own work. The aim of this study was to explore social challenges when implementing information systems in everyday work in a nursing context. Moreover, this study aimed at putting perceived social challenges in a theoretical framework to address them more constructively when implementing information systems in healthcare. Influenced by institutional ethnography, the findings are based on interviews, observations, and written reflections. Power (changing the existing hierarchy, alienation), professional identity (calling on hold, expert becomes novice, changed routines), and encounter (ignorant introductions, preconceived notions) were categories (subcategories) presented in the findings. Social Cognitive Theory, Diffusion of Innovations, organizational culture, and dramaturgical analysis are proposed to set up a theoretical framework. If social challenges are not considered and addressed in the implementation process, it will be affected by nurses' solidarity to existing power structures and their own professional identity. Thus, implementation of information systems affects more aspects in the organization than might have been intended. These aspects need to be taken in to account in the implementation process.

KEY WORDS

Implementation • Information systems •
Institutional ethnography • Nursing context •
Social challenges

Increasingly, attention is being directed toward the implementation of information systems (IS, in the following, is used in a broad definition, in the plural. As used here, IS includes clinical IS and health IS[1] such as electronic health records and decisions support with the common purpose to improve healthcare routines and quality of care[2]) in everyday work in healthcare.[1] An aim of IS implementation is achieving benefits, such as the distribution of safe healthcare,[1] based on their capability to distribute information at a rapid pace,[3] which may increase administrative efficiency and effectiveness.[4] Although IS may be associated with a number of benefits for the healthcare organization, staff, and patients, their implementation in healthcare has, in reality, often become a lengthy process.[5] Unexpected negative effects in efficiency and safety have been exposed
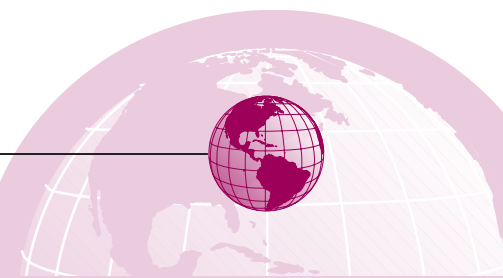
in a number of implementation projects.[6] To overcome these challenges, there is a need to highlight the interconnectedness between social and technical issues when adopting and implementing IS.[7] Technical issues are often in focus during the implementation process,[8] although social challenges in everyday work and organizational structure in healthcare need greater emphasis both in research and in practice.[7] There is a tendency for IS success models to emphasize the information and system qualities as important factors, influencing user satisfaction and the impact that IS have on the organization. Rarely do they

illustrate the social challenges behind the IS success factors.[9] The implementation processes of IS are frequently referred to work system frameworks,[10] where social challenges may be diminished within overarching system theories. Social challenges, sometimes called wicked problems, are multifaceted problems in the process of implementing IS, derived from interaction issues in everyday work.[11] Thus, interaction needs to be taken into consideration in the design and implementation processes of IS.[11,12] Interaction becomes an important part in the process of the implementation of IS: management and workflow are parts of the process where this is especially the case.[13] Also, interaction is important in healthcare: different professions work closely together with a shared goal of delivering safe care. How to support interaction needs to be considered by IS that are implemented in healthcare.[14] Nevertheless, when delivering care with the assistance of IS where patient information is technology based, nurses are often not involved in system activities, for example, output and process. Previous research has shown that, often, nurses only put information into the system and do not get the overall picture of the usability and potential usefulness of it in their own work. Having work assignments that only allow nurses to feed systems with information makes it difficult for them to perceive the important part they play as coordinators of information in their IS saturated everyday work.[15] Besides caring for and treating patients, nurses, together with other healthcare professionals, educate students and do research.[16] They also work in interdependent and interdisciplinary ways in collaboration among different professions, wards, and units.[13] As coordinators of information and teamwork, interaction is an important part of their everyday work.[14] If interaction with IS is limited to feeding systems with information, nurses may feel neglected and experience dissatisfaction in their work.[15] Solutions to social challenges when implementing IS are socially constructed and dependent on the people who have been involved.[11] Social challenges in implementing IS in healthcare reported in recently published research papers refer to wicked problems in communication structures: teamwork and everyday work changed when IS were implemented. The team became important when individuals needed support in assessing and understanding IS in work practice.[17–19] Because of the nonadaptation of IS to existing workflows in healthcare, work patterns had to be changed. When healthcare professions (eg, nurses) have been involved in the development of IS,[15] confusion in cooperation between professions and lack of joined-up thinking in different workflows that are involved in IS have caused problems and delays during the development process.[15,19] Also, there were social challenges in getting key individuals involved in paving the way for IS. In addition, problems surfaced in clashes between the established structure of the hierarchal organization in healthcare and the new possibilities of cooperation that IS provided.[17,18] Recent research on IS implementation in healthcare highlights the importance of further empirical research on social challenges and their impact on everyday work from a wider social-theoretical perspective.[17–19] Therefore, this study focused on empirically identified social challenges in a specific healthcare context. It also includes a wider social-theoretical framework.

A social challenge when implementing IS in healthcare is defined as critical[8,20] or a significant barrier[5] in relation to people, values, norms, and culture in an organization.[11]

Implementation is referred to as the step in the innovation-decision process when an innovation is put in use by individuals.[21] Information systems are interpreted to be innovations, being the kind of artifacts that are identified as new units to adopt in everyday work.[22] Implementation is a part of the rational sequence of actions that take place in everyday work to put new ideas or artifacts into diffused practice.[21] Here, IS are seen as new social artifacts in everyday work, which are designed to solve interpersonal work-related problems to bring value to the organization.[23] Before individuals are able to accept new artifacts and contribute to their implementation in practice, they need to obtain knowledge and understanding of their meaning in specific work situations. Thus, the diffusion is influenced by the process of how individuals communicate and construe IS as new social artifacts in healthcare and how long this process is in progress.[20]

The theory of diffusion of innovations is used as part of the social theoretical framework. It explains how innovations, such as IS, are spread and communicated over time and through channels in social contexts.[20] Although the theory of diffusion of innovations is based on voluntary use of IS among members in a context, and the diffusion of IS in healthcare is not always based on voluntary use, there is a need for studies of implementation of IS in healthcare analyzed according to this theory.[24] To explain the complexity of implementation, the theory of diffusion of innovations needs to be supplemented with a discussion of interaction in socially construed realities. Also, the influence of context needs to be made explicit in the analytical approach.[25] To focus on and highlight the socially constructed reality of healthcare where IS are implemented, Social Cognitive Theory is used. Social Cognitive Theory explains how behavioral patterns influence each other: it is their overarching result that explains behavioral patterns.[26,27] Bandura[28] and Bandura and Locke[29] define an individual's ability to be successful in a situation as self-efficacy. Well-grounded self-efficacy is the source of a strong belief in the situation as challengeable and manageable. Goffman's[30] dramaturgical analysis is used as a contextual complement. Individual behavior is seen as a dramatic consequence emerging from the drama that is being produced in everyday life. On the basis of norms and values, individuals present themselves in different roles. The performance is the presentation of self and the attempt to create impressions in the minds of the audience. If the performance is interrupted or changed because of a new setting, the audience

may experience the performance as cynical and unreliable.[30] Moreover, the organizational culture analyses of Schein[31] and Johnson[32] are a part of the theoretical framework. Organizational culture is seen as a group's shared assumptions divided into artifacts, values, assumptions, and behavior. An organizational culture paradigm may be compared with a web of symbolic, political, and structural features, including routines, stories, symbols, power structures, organizational structures, and control systems. Mapping organizational culture in this way may provide useful insights concerning what areas of organizational culture are influenced by new conditions in the organization, for example, implementation of IS in everyday work.[31,32]

The importance of social challenges in an implementation process was explored in studies conducted in connection with an IS implementation project at a care institution in the south of Sweden (2010–2012).[19,33] The study was about nurses' and student nurses' experiences of implementation of IS in everyday work. They indicated the significance of social issues that arose when IS was to be implemented. Hence, this study focused mainly on nurses' and student nurses' experiences when IS were implemented in their everyday work. Thus, the aim of this study was to explore social challenges when implementing IS in everyday work in a nursing context. Moreover, the study aimed at putting perceived social challenges in a theoretical framework to address them more constructively when implementing IS in healthcare.

Nursing Context

A context is defined as a socially framed situation where individuals have found and maintain their social identity.[30] The context in this study included nurses in a primary care unit and in a ward at a county hospital; they were part of the same county council. At the time (2010–2012), they were taking part in an IS project with the aim of providing safe and accessible care. Also, student nurses were included in this IS project and in the context. The project was a collaboration project with the university college where the student nurses were enrolled. At the county council, approximately 5000 individuals were employed at the time of the study. About 1500 of them were nurses. At the university, 400 students were studying at the nursing program. Student nurses studying in their fifth semester were included in the context. At the time of the study, they had had 20 weeks of internship at the county council. Defining the context spatially, temporally, and also theoretically limits the complexity of what is studied, but delimitations indicate what to expect from the study as well as what we need to learn more about.[34,35] That is, the place, time, and theories presented are guidelines concerning what happened at a certain point and place in everyday work when IS were implemented. They may also be an important part of a broader and deeper understanding, putting the implementation of IS in a healthcare context in a wider social framework.

METHODS

To problematize how individuals take part in ruling relations of power and management in society, this study has been influenced by institutional ethnographic research design.[36] In institutional ethnography, social relations in a specific context are understood as being related to sequences of action created elsewhere. Although individuals create their social relations in a context, they are influenced by artifacts, texts, and practices when entering their relations. Thus, studying what people do in social relations is grasping the ruling relations of the specialization of a society.[36] Everyday work in healthcare includes activities defined by other activities in the past: They are all linked together in a certain order.[37] This means that everyday work is seen as based on a number of well-founded activities that are parts of ruling relations in society. When these activities are changed, the social structure of a certain context may be disturbed. Interviews, observations, and written reflections were used when everyday work in a nursing context was studied. The linked activities and the disturbance of the social structure were identified when individuals wrote about and were asked about and observed in everyday work.

Using institutional ethnography as a base for the research design, two data dialogues are involved in the methodological practice. The dialogues assist the researcher in understanding the interconnectedness between social relations and ruling relations. The primary dialogue is between the researcher and the individuals who are being interviewed or observed in a context.[36,37] The primary dialogue was framed as a qualitative study[38]; it was based on interviews, observations, and collected written reflections in a nursing context in the south of Sweden (2010–2012). In all, 10 district nurses were interviewed about their experiences of implementing IS in their everyday work. They were between 30 and 65 years of age. All of them were women. Furthermore, 19 student nurses were interviewed and asked to write down reflections about social challenges to implementing IS they had come across during their clinical training in primary healthcare and hospitals. The students were between 21 and 35 years of age, and the group included both female and male students. Finally, observations were made at a fairly large hospital. During 6 days, observations were made at a ward. One author observed nurses in their everyday work at the ward during morning, afternoon, and night shifts. All participants were informed (orally and in writing) of the study. Participation was optional for nurses and student nurses. All participants gave their informed consent. To guarantee anonymity, no names or places are mentioned in the text. Discussions were held

with the ethical review board in the southeast part of Sweden. An ethical review was made to make sure the study takes into consideration and acts on ethical advice.

The second dialogue in the research design approach inspired by institutional ethnography is between the researcher and written empirical data.[36] To grasp the second dialogue,[37] a directed qualitative content analysis was made. Collected data were organized to discover underlying patterns of social action that are related to a theoretical framework.[39,40] Texts from interviews, reflections, and observations were read, coded, and categorized, guided by existing theory. Similar codes were then included in different categories. Three main categories and seven subcategories were found in the analysis. Organizing empirical data in this analytical way is done in an attempt to highlight the second dialogue[36] and to not only focus on individuals' experiences but also put them into a context by studying the underlying patterns of social action. A directed content analysis paved the way for the wider social theoretical framework that was required to understand social challenges when implementing IS in healthcare. Categories that were identified in the content analysis are presented in Figure 1.

◼ RESULTS

In the following, categories, including subcategories, that were identified in the content analysis phase of the study are presented.

Power

Power was perceived as a social challenge when implementing IS in everyday work in healthcare. This category included changing the existing hierarchy and fear of alienation.
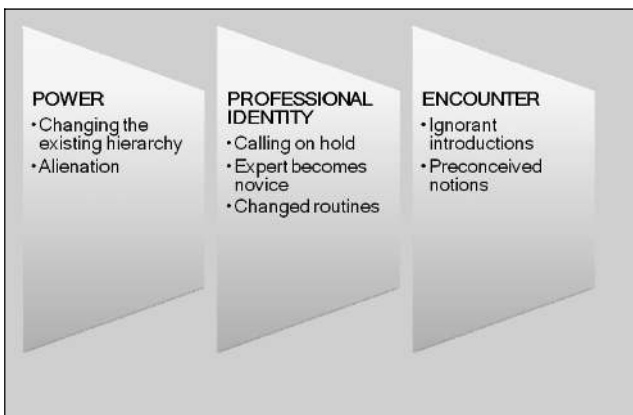

FIGURE 1. Social challenges when implementing information systems in everyday work in a nursing context.

CHANGING THE EXISTING HIERARCHY

Implementation of IS caused confusion within the powerful hierarchy that existed in healthcare. In everyday work, there were distinct chains of command. There was a clear order in the division of power among physicians, nurses, and assistant nurses. Physicians gave orders to nurses, and nurses, for their part, instructed assistant nurses in the prioritization of their assignments. Only rarely, bottom-up orders were given from assistant nurses to nurses. However, when IS were implemented, assistant nurses found IS easy to understand and use, and they instructed nurses on how to use them in everyday work on the ward. The changed hierarchy affected the equilibrium in division of power in everyday work. To regain equilibrium, assistant nurses stopped using IS. It was of importance which of the staff members concerned himself/herself with the implementation of IS. If nurses who were highly esteemed in areas of expertise by their colleagues found IS important, it was easier to adopt and implement them.

There was a sense of security and identification of one's own position in the hierarchical organization. In new ways of working that came with the implementation of IS, questions of detail became very important to staff members. For instance, nurses got stuck in discussing issues such as the importance of looking professional when they talked to patients via a teleconference system, which was one of the IS being implemented in the county council at the time of the study. Also, the implementation of IS introduced new ways of working, with closer connection between different wards and institutions. There were differing opinions about other healthcare occupations and other wards and institutions and how things were done, or not done, there. One district nurse (interview 2) expressed her concern about this closer connection imposed by IS. Before, she had been a central character in the coordination around and setting up of the caring plan of the patient. Now, several different professions needed to gather and together talk to the patient: "Now we need to gather in front of the IS [...] Well, now the home help officer needs to sit next to me...hmm."

At the same time, there were concerns voiced about unwillingly becoming the central character. This was an experience some nurses felt they had had when IS were implemented; IS changed their part in the play in everyday work. One nurse (interview 1) expressed her worries about being assigned another part in the play, as she felt that when IS were implemented, her work would be more in the spotlight than before: "No...well.... We are somewhat of non-persons in healthcare; we are used to being the invisible ones..."

ALIENATION

Implementation of IS had an influence on the feeling of getting the whole picture of everyday work. Because of the

hospital's aspiration for standardization in connection with implementing IS, the nurses felt separated or distanced from their work. Information systems did not fit the existing, local work flow, nor did they fully suit the nurses' requirements concerning what kind of work needed to be done in their aim of providing care to patients. This resulted in a lack of interest in IS. Nurses indicated that they had tried to raise their voices in proclaiming the importance of their request for a comprehensive overview when designing IS. When no one listened to them, this resulted in a lack of interest in IS. One student nurse (reflection B15) reported lack of interest as a kind "indifference" to the IS due to their dividing forces. There was a sense of fear that IS would take command and separate nurses from their work. One student nurse (reflection A8) reported the fear of putting IS in control: "There is a risk of IS playing the main part.... They should not replace relationships [...] Social aspects are of great importance. Of course, IS can increase quality of care, but on the other hand we need to keep in mind that every mouse-click makes a difference in our work!"

Two district nurses (11, 12) and a student nurse (reflection A1) pointed out that implementation of IS resulted in fear that the implementation was the beginning of working at a conveyor belt where IS were supposed to be streamlining and supervising tools. Because of lack of interest and a constant sense of fear, the IS manuals were never read. The manual was put in a bookshelf in the nurses' office. Instead, staff told each other how to deal with the IS.

Professional Identity

Nurses experienced professional identity as a social challenge when implementing IS in everyday work in healthcare. This category included calling on hold, expert becomes novice, and changing the routines.

CALLING ON HOLD

The reason nurses chose their profession was often expressed as that they perceived it as a calling. The profession became, in some sense and to some extent, a mission in life. Often, individuals knew that they wanted to become nurses at an early age because of their wish to make a positive difference in real-life situations in the world. They wanted to be important in what they did in their work. When affected by the implementing of IS, this intention was diverted. They had to put off the mission of taking care of patients. Instead, they had to learn to control IS and devote their time to interacting with IS. One student nurse (reflection B 11) expressed her concerns with a calling on hold: "many of today's nurses found their way to this job due to their wish to interact with patients and to care for patients, not to sit in front of a computer screen."

Implementation of IS brought with it a new way of thinking when taking care of patients. Nurses missed interacting with patients; instead, they had to report via IS about the patients. A student nurse (reflection B4) stated that IS controlled her profession. Concerns were expressed about the fundamental ethical principles. The way they felt that new ethical principles did not match the IS was above all concerning the managing of personal data. These were some of the reasons nurses thought that everyday work was not what it used to be; they had to do tasks that were in direct conflict with the main reasons they had originally chosen their profession. The collision with the calling caused an uncertainty about the new situation. One district nurse (interview 10) exclaimed in exasperation:

Before I knew the patients, but that's old news [...] Now, I don't know them and their life history, their fathers and wives. Now, [...] yes, I am shaking my head. I can hardly describe it [the new situation]...

EXPERT BECOMES NOVICE

Implementing IS in healthcare changed not only one's self-conception of being expert at performing a piece of work but also the relationship between student nurses and experienced nurses. Student nurses were often taught the benefits of IS in everyday work during their studies. However, they had difficulties in showing this on the ward; they were perplexed about how to act as experts and novices at the same time. Also, student nurses wished to fit in beside their more experienced colleagues on the ward and show respect toward established work practice and the seemingly broadly shared feeling of IS being something that split up their profession. One student nurse (reflection B4) wrote that her instructor told her to "be humble to old nurses' experience and wisdom." Sometimes, nurses reported that they felt exposed when someone in the group expressed their positive excitement about IS. One student nurse (reflection B21) expressed concerns about the rigid response new ideas sometimes get:

All staff don't listen to new nurses or assistant nurses, if they come up with ideas about change, improvements or something they have been taught [about IS]. They think "No! This is how things work here and this is how we normally do it and this is what counts". This happens when IS are implemented or when routines are changed at the ward.

Nurses showed explicitly that they did not trust IS. They developed methods to maintain their expertise despite the implementation of IS. For instance, several nurses wrote down all the information they needed from the IS on notepads they kept in their pockets. Also, they wrote down information about the patients in the pad. When the shift was over, they sat down in front of a stationary desktop computer in the office and typed the information into the IS. Finally, information that could be found in IS was

written down on whiteboards, Post-It notes, and on notice boards. Sometimes, experienced nurses were aware that implementation of IS changed the prerequisites for their work. Some nurses joked about IS, how to use them and how to deal with them, as a way of grasping and gaining control of the changed conditions for their everyday work. One district nurse (interview 10) acknowledged the challenge of having to change old routines and habits and learn things anew in her profession: "It's hard work [IS]! You need to get to know the gadgets and if they are new you don't know them!"

Another method for maintaining one's status as an expert nurse was to ignore IS and let nurses who knew and understood IS do all the work. One student nurse (reflection B9) wrote that ignorant staff put the blame for taking no notice of IS on other work priorities.

CHANGED ROUTINES

The importance of routines in everyday work in healthcare was noted. This became explicit in the synchronization that was accompanied by routines. It was almost as though nurses were dancing together. When implementing IS, the established routines were broken. Nurses were annoyed with new practices. A district nurse (interview 4) expressed her concern about losing confidence when having to change routines that had functioned well previously: "…This with new IS… Phew, why do you have to do it like this? Why change everything!? Well, I guess we'll live through it…"

Although routines might actually be out-of-date, they provided a feeling of security, of doing things right. Nurses often compared new routines connected to IS with old ingrained routines. A district nurse (interview 1) confessed that old routines were out-of-date, but still they gave confidence. With the implementation of IS, this confidence was displaced. The perception of time changed with the implementation of IS. Nurses had to reprogram their time and how much time every working operation required. Sometimes, IS shortened a working operation; sometimes, they extended it. A student nurse (reflection B4) noticed that time took on a new meaning when implementing IS. Staff were uncertain about how to redistribute work tasks. Also, this reprogramming of time schedules created an uncertainty about why IS were implemented. Several district nurses expressed their anxiety about saving time with IS and how this would affect not only their everyday work but also their routines and professional pride.

Encounter

Nurses experienced the encounter as a social challenge when implementing IS in everyday work in healthcare. This category included ignorant introductions and preconceived notions.

IGNORANT INTRODUCTIONS

How IS were introduced affected how IS were incorporated in nurses' everyday work. Information about why and how IS were supposed to assist staff was negligently conveyed; a district nurse (interview 5) expressed frustration concerning how information was conveyed between staff and management. This resulted in the staff not getting a comprehensive understanding of IS: "IS came to us very unexpectedly… I guess it is like that when [head's name] has all the information [about IS] and we are somewhat left outside. […] Some knew about IS and some didn't… I do not know why we need IS? […] Dash it, I don't know…"

Paradoxically, IS introductions were riddled with technical terms on one hand and, on the other hand, seemed to presuppose that nurses were afraid of IS. Often, a low-key and soothing tone was used when introducing IS. At the same time, the introduction included many unknown words to nurses. Still, those words were important to be able understand and get a grasp of IS. Introductions that were smooth but at the same time quite incomprehensible caused a growing cynicism toward IS among staff. Afterward, there was a lack of conviction about the benefits of IS among nurses. These introductions also resulted in feelings among staff of not being provided with the opportunity to find a good way to conclude with old ways of doing things, to talk about and decide on which routines were supposed to be changed by or replaced with IS. One nurse expressed this unfulfilled need to feel that old routines were wrapped up and concluded with an introduction in the following way: "You see, it is of great importance to feel that you are divorced from the old before you marry something new!"

Introductions contained many different kinds of technical terms. Nurses and introduction crew (often from an IS company or IS project) tried to understand each other. Often, nurses said "Yes, I understand" when technical terms were used, but often, in fact, they did not understand. This caused difficulties during the implementation; IS were implemented with the assumption that there was a mutual understanding between nurses and introduction crew. Nurses blamed the crew for being ignorant when a mutual understanding proved lacking.

PRECONCEIVED NOTIONS

The implementation of IS was influenced by many preconceived notions about what was thought to be "the truth" about IS. Because of nurses' perceptions of having been ignored in introductions and never having been listened to, they were tired of the very idea of IS. Also, nurses thought they knew what introductions would be like because of previous bad experiences. In some cases, nurses did not show up at introductions of IS. Nurses also thought that IS, by definition, were difficult and complicated. They

decided in advance that IS would cause difficulties in their everyday work. These kinds of expectations often had the result that nurses easily gave up when trying to learn how to use IS in their work. At introductions, nurses took for granted that IS could not accomplish complex work tasks. Nurses were convinced that the implementation of IS would affect their relationship with patients. When implementing IS, a lot of time would be needed to learn to use IS, time that was previously spent with patients. Thus, the patients would not be prioritized when implementing IS. A district nurse (interview 9) was sure that patients would feel less safe when staff were involved in implementing IS:

> Many elderly [patients] don't understand this [IS]. Impressions are important, you see! My duty is to make patients feel safe!

Nurses thought that when implementing IS, their interaction with the systems would be monotonous and invisible. Interaction between people was perceived as a useful tool for communication in everyday work. Words, actions, and expressions were how staff worked together and understood each other. With IS, this would not only change but also become less important and be given less space in the context.

DISCUSSION

Power structures in healthcare provisions might be a social challenge when IS are implemented. The study shows that existing organizational hierarchy was affected and feelings of being a small cog in a big wheel were articulated among nurses. Established areas of expertise were perceived as less useful than they had been before the new IS were implemented. Self-efficacy[28,29] might be influenced in the IS era; nurses are not always used to IS and did not trust their capabilities to execute the required actions with IS. Consequently, IS did not support and enhance professional skills that were the foundation of a position in the hierarchy before the implementation. This foundation was not only the base for a position in the healthcare hierarchy, it was also a base for how nurses behaved and felt about themselves and their role in the organization. The diffusion of an innovation (eg, IS) is influenced by the structure of the social system it aims to be a part of.[21] If IS do not support skills and norms in the existing social system, this might affect the motivation for adopting and using IS in everyday work in healthcare.

Changed power structures and inherent resistance to such changes also modify roles that nurses are used to taking and feeling self-confident in enacting. This became evident when assistant nurses tried to play a new role in introducing IS. Also, role modification was highlighted. When a role is changing, an individual might feel insecure about how to act with credibility. The modified role may

be considered to affect teamwork on stage[30]; the person taking on that new role might be perceived as an informer who discloses information about how IS are used or not used to project managers or management. Also, a changed role might be looked upon as an attempt to affect the idealization of a play or the management of impression.[30] Often, the audience (eg, patients) has thoughts on how the performance is supposed to be given. If the performance is not carried out according to expectations, the audience will be confused. If roles are not dedicated to maintain this idealization, the play will be looked upon as unreliable.[30] Modified roles in a changed power structure also have an influence on the importance of culture.[31,32] The web of symbols, stories, and artifacts are changed when IS are introduced. This means that the implementation not only influences the web of symbols, stories, and artifacts but also might erase old culture symbols that do not fit into new roles or plays. Hence, there are rigid rules regarding how to be or not to be in a healthcare culture. These rules have shaped a safe but not very flexible performance. Implementation of IS has affected these rules of performance and will modify nurses' thoughts about how future performances should be given in everyday work. Implementation of IS will change important stories and symbols and perhaps even delete a number of them to make room for new symbols.

When implementing IS, nurses felt that they lost sight of the whole patient picture. They felt that IS controlled assignments in their everyday work such that they felt as though they were standing at a conveyor belt. When nurses are unable to manifest themselves in their work, a kind of alienation (*Entäusserung*) may occur. Feelings such as dissatisfaction and destructiveness may arise at the same time as nurses only feel satisfied outside their work.[41] Moreover, a dividing force, a symbol in the facade that does not fit the performance, might affect the credibility of the play and may also affect the individual's manner.[30] Nurses felt that IS changed the time perspective in their everyday work. Time is an important part of diffusions of innovations[21]; if there are feelings that a reprogramming of time is necessary to adapt to IS, nurses might feel lost in the diffusion of IS. Thus, implementation of IS can contribute to that nurses cannot identify themselves in their everyday work or feel comfortable in their role as a nurse. Implementation of IS may start or contribute to a process where nurses feel that they are drifting away from their main mission of caring for patients.

The sense of calling or mission in life has long been important in the socialization process of becoming a nurse. To encourage and support the calling, healthcare culture has created many stories and symbols about it. In the cultural web of healthcare, the symbolic part is very strong and deeply rooted.[31,32] Culture affects nurses' self-efficacy.[28,29] Work identity may be disturbed and diminished if culture hails the calling at the same time as there are feelings of

not being able to manage everyday work in a nursing context. Hence, established work identity may be pulled up by its roots when IS are implemented if culture is ignored when implementing systems that will affect everyday work and all the stories and symbols about it. Or as Smith[36] might have put it, activities in the chain of social relations are changed in order to link together in the new specific order.

Although student nurses, through their studies, have learned to understand the potential benefits of IS in their future work, they are socialized into a culture where expert knowledge is of great importance. If a strong cultural web or social system[21] with deeply rooted symbols and stories[31,32] does not acknowledge intrinsic characteristics[20] that will influence a culture's rejection, adoption, or diffusions of IS, it may be hard as a newcomer to convince the existing culture to adopt IS. To become an established member within that culture, an outsider of the culture needs to become a part of the solidarity.[42] In this shared solidarity, tradition and experience are of importance. A newcomer will therefore easily fall in line beside the colleagues as a way of practicing and becoming a member of the community and to not spoil the performance.[30] So although novices often know more about IS than experts do in nursing, they might not use their authority with deference to their desire to please and be accepted as a part of a group.

Routines are important in everyday work even if they are out-of-date. If routines are changed, nurses may feel insecure about how to deal with the changed situation. Routines give confidence in everyday work. The cultural web highlights routines as a part of what brings meaning to things that staff do, feel, and talk about[31,32] in everyday work. Hence, even though routines are out-of-date, they are a part of how staff act together and understand each other. The implementation of IS disturbs the flow in how things are done in healthcare even if the purpose of the implementation is to facilitate everyday work.

How nurses were introduced to IS and what they thought they knew about the encounter with IS played a crucial part in the implementation. For instance, introductions on the wrong level, given with a deprecating tone, affected nurses' further encounters with IS. If a culture has assumptions about how to deal with a symbol (IS), this might affect nurses' attitudes towards the symbol. To protect the existing culture, they may create a safety net of preconceived ideas around the new symbol.[31] At the same time, if a new performance is about to start on stage or a new behavior pattern is introduced; they need to be explained in a suitable way given the competence levels and perspectives of the involved actors. Also, the introduction needs to include the benefits of IS in such a way that nurses understand them.[20] That is, IS change the performance and need to be introduced in such a way that nurses can incorporate them into their everyday work. If this is not the case, the performance of nursing may be performed with hesitation. The hesitation in the performance might in turn influence the confidence the patients have in nursing and its performers.

This study has its limitations. Social challenges discussed in the text are examples. There are other social challenges of IS implementation in a healthcare context that could be highlighted. Information systems are used in the plural and include different kinds of IS. Consequently, it is not possible, based on this study, to refer a certain kind of social challenge to a certain type of IS such as electronic health record system or a decision support system. Other health professionals may have other experiences and perceptions. However, the identified challenges are of importance and need to be further explored in research and in implementation processes. The reported experiences from this study may hopefully contribute to raising awareness about social challenges in the implementation of IS in nursing contexts.

CONCLUSION

One might wonder if social issues may change with the new generation of nurses who know more about IS and are used to using a multitude of information technologies in everyday life. However, this study indicates that student nurses learn to respect the traditional way of nursing and to accept the existing respect for professional experience as they become socialized in to the profession and established work practice. This tradition in healthcare culture will have an impact on the social challenges in implementing new tools in the work place. A strong culture in healthcare is good in many ways, but it poses social challenges when IS are implemented. A culture or a social situation needs to be prepared for a change to fully take it on. The importance of understanding and addressing social challenges in the implementation process of IS is highlighted. The implementation of IS will be affected by nurses' solidarity to power and professional identity, whether this is acknowledged or not during the implementation process. If acknowledged and addressed during the planning and introduction of IS in a healthcare context, social challenges can be used as opportunities. In healthcare contexts, IS should support a comprehensive overview and accountable interaction in everyday work on the ward. In this way, IS can support the collaborative enactment and enhancement of professional identities where expertise includes openness toward innovation and change when routines become outdated.

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