May the force of lifelong learning be with you – sustainable organizational learning in HEIs meeting competence needs in industry

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Abstract

Purpose – Technological advancements and global societal changes reshapes manufacturing industry emphasizing needs for competence development of industrial professionals. The purpose of this paper is to study how organizational learning supports the development of academic structures, creating agile and sustainable formal educational models meeting novel competence needs.

Design/methodology/approach – The qualitative case study, part of a longitudinal research study, focuses on internal academic processes supporting a new formal educational model. Qualitative data was collected through five focus groups, incorporating 32 informants from different HEI function categories.

Findings – Changing traditional academic structures requires joint engagement between all HEI functions, emphasizing organizational learning with subprocesses of searching, creating, sustaining and exchanging knowledge in a learning loop. Results show a consensus among the different HEI functions regarding the value of the HEI's coproduction with society; however, bureaucracy and academic structure hinder flexibility. Cross-functional teams building a "chain-of-trust" throughout the HEI coupled with full management support show opportunities to progress into a learning organization.

Practical implications – Organizational learning within HEIs requires trustful and open communication, multifunction knowledge exchange, holistic views of processes and system thinking, achieved through cross-functional teams and continuous improvement through learning loops.

Social implications – Industry-academic collaboration on formal education for lifelong learning needs to become both agile and resilience to meet technological advancement and sustainability.

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Originality/value – Novel technology, digitalization and sustainability gain ground and require that society and organizations, including academia, change and learn. This means that academia is meeting new challenges and needs to develop internal processes.

Keywords Work integrated learning, Organizational learning, Industry-academic collaboration, Lifelong learning, Competence development

Paper type Research paper

Introduction

The manufacturing industry is forming strategies for implementing novel technologies in the era of Industry 4.0 (I4.0) (Alcácer & Cruz-Machado, 2019; Frank, Dalenogare, & Ayala, 2019). Advancements, such as smart automation, the Internet of Things, machine learning (Osterrieder, Budde, & Friedli, 2020) and global societal changes, continuously reshape the manufacturing industry, creating new skills and competence needs for industrial professionals (Breque, De Nul, & Petridis, 2021). The introduction of Industry 5.0 (I5.0) complements I4.0, highlighting the importance of a sustainable, human-centric and resilient industry (Breque et al., 2021). I5.0 emphasizes upskilling, reskilling and the necessity of lifelong learning to ensure a future skilled workforce (Maddikunta et al., 2021). The advancement of knowledge is important for a global sustainable future, for making use of technological leaps, and to meet occurrences in a changeable world with resilience (United Nations, 2022). However, the manufacturing industry is struggling with applying novel technologies and meeting skill shortages, while higher education institutions (HEIs) are traditionally not structurally organized to design for and continuously and rapidly meet the new educational demands progressively surfacing.

By contrast, a Swedish HEI in collaboration with around 50 external partner organizations, from the manufacturing industry, have (since 2013) developed and coproduced a novel formal educational model with short courses (2.5 European Credits Transfer System [ECTS]), at the master's level (second circle), targeting competence development of professionals (Hattinger & Eriksson, 2020). Educational models have evolved over the past decade (Kashyap & Agrawal, 2019), with the content of the courses consecutively adapted to the shifts in industry competence needs (Eriksson, Bränneby, & Hagelin, 2021). Those journeys of higher education developments have seen many phases, e.g. calibration of coproduction activities between industry and academia (Bruneel, D'Este, & Salter, 2010; Holland, 2019) and adjusting to a suitable course format for professionals working full time (Hattinger & Eriksson, 2020). In the past, manufacturing has been able to manage their own competence development to a large extent. However, in the current era, the rapid development, novel and complex technologies, introduction of new manufacturing processes and the ongoing digital transformation means that the manufacturing industry is struggling with upskilling and reskilling (Breque et al., 2021). Novel competence development initiatives are thus necessary to be offered from HEIs, and this challenges traditional HEIs to change educational processes.

However, the aspects of corresponding and necessary organizational learning and changes to traditional academic processes to successfully encompass such new formal educational models into the regular education prospects and course offerings are challenging and need further understanding to reach learning (Hattinger & Eriksson, 2020; Holland, 2019). Örtenblad and Koris (2014) state that the learning structure within HEIs is the most complex aspect and needs further examination. Further, Pacis and VanWynsberghe (2020) mean that today's complex problems require collaboration and, thus, the ability to accept different views to transform knowledge into action and create real-world change. It is, therefore, of great importance to be able to balance the educational institutions' needs for structure and

bureaucracy (Casson, 2015) with new opportunities for formal lifelong learning education for the individual, organization (academic internal processes) and society for a sustainable future.

Novel educational initiatives require changes, i.e. organizational learning, to many functions within HEIs organizations, emphasizing that knowledge between functions needs to be transferred, shared and exchanged (Argote, 2013). The aim is to study organizational learning and changes to the organization's knowledge and experiences when introducing a new educational model in 2013 and the challenges that followed over the following 10-year period. The novel education, coproduced with external partners, required faster introduction and higher turnover of new courses mandated handling new and adjusted internal processes throughout the HEI organization. Following this, the research question asked is:

RQ1. How can academic structural changes for creating agile and sustainable higher education to meet industrial competence needs in a changing society be understood from a longitudinal perspective of organizational learning?

Higher education institutions and competence development of professionals

New competence and knowledge arise as technology advances in the era of I4.0 (Breque et al., 2021). The importance of continuous lifelong learning and reskilling is specifically addressed in the sustainable development goal number 4 (United Nations, 2022). New skills and reskilling needs arise as workers in the eras of I4.0 and I5.0 are expected to handle an array of technological, societal and organizational issues (Maddikunta et al., 2021). However, dealing with fast and frequent technological advancement, strategically and continuously upgrading competences is challenging (Teece, Pisano, & Shuen, 1997). This means an increasing need for novel initiatives for lifelong learning and competence development of professionals for a sustainable future manufacturing industry (Eriksson et al., 2022).

Opportunities and needs for academia to act as a supplier of advanced knowledge for industry are addressed by Kashyap and Agrawal (2019), highlighting the need of the knowledge component in I4.0. Several barriers, such as lack of communication between HEIs and industry and the mindset of academic administration, have been identified (Kashyap & Agrawal, 2019). In the study presented here, which is part of a 10-year longitudinal study, the internal academic structure and, thus, the organizational learning is researched in relation to industry needs of new knowledge for competence development. Several studies have investigated barriers of HEIs and industry collaboration, though often the focus is on research collaboration rather than how educational collaboration affects internal academic processes (Bjerregaard, 2010; Tartari, Salter, & D'Este, 2012). It has been highlighted that studies often focus on what universities do as partners rather than providing an understanding of how universities engage in professionals' competence development (Holland, 2019).

University education in its traditional format is not designed with the purpose of targeting professional course participants from the industry (Bruneel et al., 2010). The target group of industrial professionals often working full time means they need to combine employment with studies, requiring short courses in different formats, such as blended learning (Hattinger & Eriksson, 2020). Research into HEI initiatives for targeting the competence development of professionals has often focused on suitable formats of courses, i.e. pace, format or pedagogy (Chang, 2016).

To be able to meet industry needs of new knowledge through HEI courses, novel approaches for course design are essential. Thus, educational models, catering for professionals' competence development, signify changes to existing academic structures and organization. Processes and time plans cater to meeting the demands of larger and longer-term study programs. However, the importance of opportunities for lifelong learning,

both for the individual and for the economic benefits of society, is brought forward (Casson, 2015). Simultaneously, it is recognized that there is increasing administration in academia (Ginsberg, 2011) and overambitious bureaucratic and economic systems in HEIs (Casson, 2015). Thus, there is a need for further research apprehending the academic structural changes through the longitudinal perspective of organizational learning to be able to meet new knowledge needs in a changing and technological advancing society.

Organizational learning

This section outlines the theoretical frame of organizational learning and explains how organizational learning can be applied when designing new formal educational models in HEIs.

Research into learning and organizational learning has developed since the 1970s, and during the 1980s and 1990s, the interest grew considerably (Granberg & Ohlsson, 2018). This area of research is wide, deep and multidisciplinary. Pioneering research (Senge, 1990) highlights four core disciplines needed to build a learning organization: personal mastery, mental models, shared visions and team learning. The fifth discipline, system thinking, is the conceptual framework to identify patterns to develop, learn and change. Garvin (1993) explains that a learning organization is accomplished in creating, retrieving and transferring knowledge toward change to mirror this new awareness. Tuggle (2016) summarized learning organizations (1994–2013), and five major themes emerged:

(1) Mechanisms by which organizations learn;

(2) How organizational learning contributes to organizational success?;

(3) The effects of organizational learning on a firm's financial performance;

(4) The role of culture and knowledge sharing in organizational learning; and

(5) Individual learning and organizational learning.

Individual learning and organizational learning in relation to productivity and the discussion of knowledge transfer between organizations are reviewed by Argote (2013).

Örtenblad (2018) presents four versions of the learning organization, i.e. learning at work, climate for learning, organizational learning and learning structure. A learning organization is an organization that "learns as if it were an individual and the organization becomes a learning unit in itself," thus the assumption is that there is a favorable climate for learning (Örtenblad, 2018). Context-adapted models are presented, arguing that different types of organizations have disparate challenges, and each individual organization must adapt and create its own unique model for learning organization (Örtenblad, 2015).

Modern organizational learning also considers the sustainability of economic, environmental and social aspects, and organizational learning is considered sustainable from several perspectives, e.g. employee participation, shared visions, the learning climate, team learning and system thinking. Battistella, Cicero, and Preghenella (2021) builds on the theories of Örtenblad (2018) and Argote (2013) and suggest three dimensions (learning orientation, learning processes and learning leadership) for analyzing how sustainable companies adapt to organizational learning. The focus on learning processes and social learning emphasizes that sustainability promotes both a learning culture and a learning approach to strategy (Argote, 2013; Örtenblad, 2018). Further, learning processes focused on internal structure and networking values, shared leadership and self-managed teams (Battistella et al., 2021).

Most researchers define organizational learning as a change in the organization's knowledge that occurs as a function of experience and presents a theoretical framework for analyzing organizational learning (Argote, 2013). In collaboration, knowledge transfers between organizations and society continuously change the organization's context, in turn,

affecting future learning (Argote, 2013). Organizational learning is the process of *creating*, *retaining* and *transferring* knowledge within an organization (Argote, 2013; Garvin, 1993). Argote (2013, p. 205) suggests further research that examines the relationship between the subprocesses of knowledge *creation*, *retention* and *transfer* since an organization improves over time with experience, from which it can create new knowledge. Furthermore, other researchers highlight *search* as another organizational learning subprocess (Huber, 1991). The subprocesses are related, e.g. new knowledge is often created during the knowledge transfer phase (Miller, Fern, & Cardinal, 2007).

Inspired by Argote (2013), the data analysis applied in this case study departs from and develops Argote's three subprocesses (creation, retention and transfer) and adds a fourth subprocess (search). Thus, applying an analytical method to analyze the organizational learning and changes that HEIs require when adjusting traditional academic structures to encompass new formal educational models.

Case description – background and context

This case focuses on the challenges when introducing a new formal educational model affecting the internal academic processes and organizational learning. The courses in the new formal educational model shall be differentiated from contract education, which is tailormade for and paid for by companies that can select the participants, and thus validation is not needed. Nor do the courses have the same character as Massive Open Online Courses.

The concept of the new educational model has evolved in coproduction between a HEI and an industry network through a longitudinal project (2013–2023). The new courses being studied are characterized by being free of charge for the course participants from the manufacturing industry, who will receive university credits upon examination. The new model consists of many different short courses, each comprising a 2.5 ECTS at the master level within the field of manufacturing and production technology (Hattinger & Eriksson, 2020). The courses are given over five weeks (30% study pace) with 4–5 physical or online meetings. The modes of the courses vary between campus-based, blended or online (Eriksson et al., 2021). The online mode still means that classes, supervision and seminars take place synchronously, i.e. in Web meetings, and certain courses require physical robot and machine labs (Eriksson et al., 2021). Previous research demonstrates that the course participants value networking opportunities and discussions with peers, whether meeting physically or online, hence an important course design feature (Hattinger & Eriksson, 2020).

The project was situated at a production technology research center affiliated with a Swedish HEI and a network of manufacturing companies. Most of the lecturers assigned to the new courses are senior researchers with large parts of research in their academic positions. The financier of the project, the Swedish Knowledge Foundation stapled that courses should be on master level to ensure the competence advancement of professionals. However, the region where the HEI and company network were situated had a low level of professionals with previous university education. Therefore, new procedures for the validation of real competence and consideration of relevant work experience had to be developed.

In the beginning, the courses were advertised at short notice at the pace that they were developed, aiming to meet industry needs rapidly. However, the financier required that courses should be offered among the regular university curriculum, and since autumn 2018, the courses have been advertised accordingly, resulting in increased lead times for introducing new courses. The courses are free of charge for citizens in the European Union and offered through the Swedish national online admissions service (Antagning.se, 2023), where all university programs and courses in Sweden are advertised, with two main intakes yearly. Initiatives for the competence development of professionals are ongoing, and there is,

therefore, a need for further study. Since 2013, the initiatives have been researched through the lens of external collaboration and previous research focused on e-learning readiness, course design for manufacturing industry competence development and the course facilitation of opportunities for introducing new technologies (Eriksson et al., 2021; Hattinger & Eriksson, 2020).

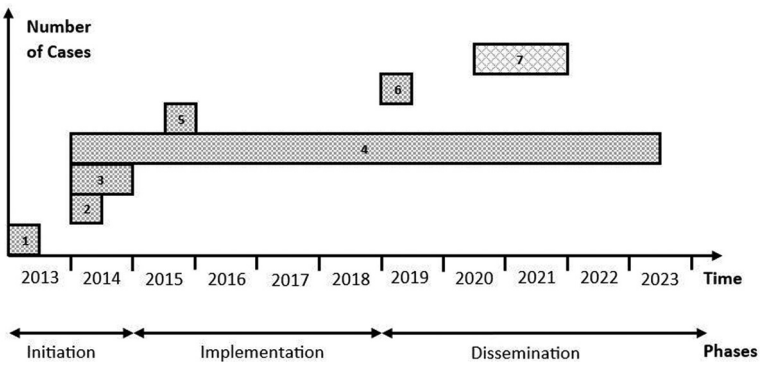
Initiatives for the competence development of professionals are ongoing, and there is, therefore, a need for further study. The study presented here takes a new direction, from previous studies, focusing on internal HEI processes to encompass a more holistic view of how HEIs can handle the increasing demand for lifelong learning (Breque et al., 2021). A new educational model was required since the traditional and existing alternatives did not fit the purpose. The new model needed to be agile yet sustainable and structured to meet both internal and external legal requirements, and simultaneously respond to the competence need for fast-paced technological development.

Methodology, data collection and data analysis

This section presents the method, data collection and data analysis.

Methodology

The qualitative case study is part of a longitudinal research study, including several cycles of planning, acting, observing and reflecting (Hopkins, 2014). The study focuses on changing the practice of work for continuous improvement, thus organizational learning. Figure 1 shows the longitudinal study spanning (2013–2023) showing all cases over time (Hattinger & Eriksson, 2020; Eriksson et al., 2021). The qualitative case study, marked 7 in Figure 1, incorporates focus groups.



Case 1: Interviews - Managers (a); competence needs
Case 2: Interviews - Lecturers; course development
Case 3: Case study - Course design; blended, target group
Case 4: Focus groups - Practitioners (ongoing); course evaluation and knowledge exchange
Case 5: Interviews - Managers (b); evaluation and new competence needs
Case 6: Questionnaire - Alumni; evaluation and knowledge exchange
Case 7: Focus groups - Internal processes; adopting a new formal educational model

Source: Created by authors

Figure 1.
Timeline of cases in the longitudinal study

To study academic structural changes in the context of new educational models, the case study methodology was applied to investigate, understand and describe related implications (Yin, 2018). The case, described here, part of the longitudinal study, includes various data sources (Yin, 2018), which are policy and governing documentation, observations over time, literature references and focus groups. Starting from observations and governmental regulations, the case study developed into the choice of focus groups to collect data on perceptions and knowledge from various functions with the HEI. Applying focus groups gives understanding of the internal academic educational processes from different functions perspectives, supporting the learning within the HEI organization. Case studies can be exploratory and are thus suitable when seeking in-depth knowledge of occurrences to be investigated (Säfsten & Gustavsson, 2019).

The case has components from design research as the purpose is to develop a new product (a new educational model) from a need (industrial competence development in an era of continuous change and increased digitalization) to realize the product and fulfill the perceived needs of the stakeholders (course participants and manufacturing companies) (Blessing & Chakrabarti, 2009). This case study examines the factors (what and why) that supported the successful development of the new educational model over time to understand success factors for organizational learning.

Qualitative data was collected through focus group sessions. The method of collecting data from focus groups was chosen to aim for an action-oriented and interactive approach where informants can exchange experiences and reflect on each other's ideas (Bell, Bryman, & Harley, 2019; Säfsten & Gustavsson, 2019). When conducting focus groups, it is principle that the interviewer acts as a moderator capable of taking part in the interaction, but at the same time not to be too controlling (Wibeck, 2010). Focus groups give voice to informants' views and collect data where informants' share, jointly reflect and build on their interpretations of a context or phenomenon (Rutledge, Gilliam, & Closson-Pitts, 2021). An essential strength is the possibility for informants to reflect and develop ideas together and construct individual and group opinions that may change and develop during the focus group's duration (Smithson, 2000).

Data collection

As outlined in the case description, competence needs and the coproduction between HEIs and industry have been studied over the years (Bruneel et al., 2010; Eriksson et al., 2021; Hattinger & Eriksson, 2020). However, it is important to understand how academia can better meet industrial competence needs. It is essential to have internal reflection among different functions at HEIs to facilitate organizational learning when changing traditional academic structures (Holland, 2019; Eriksson et al., 2022). Hence, the themes for discussion in the focus groups were designed to bring forth and grasp previous, current and future aspects of organizational learning taking place or required to take place at the HEI organization. The focus group informants were divided by function to limit power differences and restrictions to socially acceptable comments (Smithson, 2000). The case study presented encompasses five focus groups consisting of informants belonging to different functions at a Swedish HEI. The five functional groups selected were top HEI management, educational administration support, project management group, course lecturers and departmental management, including the departmental committee.

Initially, the first three functions listed were planned for three focus group sessions. However, during those three focus groups, it became apparent that the latter two function groups also needed to be included to grasp an encompassing understanding of all levels of the

organization. Because of this, the focus group themes were slightly adapted (exchanging wordings) toward the respective function groups' involvement in the HEI's education process.

See Table 1 for an overview of the data collection with five focus group sessions, including a total of 32 informants. The focus groups took place during autumn 2020 and lasted in a total of 6.5 h. Focus Group A, HEI management, included pro-vice chancellor, head of grants and innovation office, head of library, head of communications and head of educational administration. Focus Group B, educational administration, included study and career counselor, information communication technology (ICT) pedagogue, departmental academic support, Web editor and admissions officer. Focus Group C, project management, included two project administrators, project manager and chair of project courses committee. Focus Group D, course lecturers, included six lecturers with experience of teaching the new courses. Focus Group E, departmental management and departmental committee included head and deputy head of department, five heads of divisions (the engineering department has five divisions), department administrator, chair and deputy chair of department board (quality assurance and approval of course syllabus) and operations manager for departmental research. Some informants in Focus Group E were also lecturers having taught the new courses.

A semistructured thematic interview guide was used, and the focus groups were either audio recorded or audio and video recorded, transcribed and analyzed through qualitative content analysis. Informants gave their informed consent before taking part, and all focus groups began with explaining the background and purpose of the study. All informants had not worked operatively with the new formal educational model; thus, it was considered valuable to give an overview of the incentive. Thereafter, the thematic interview guide was followed with themes of whether the new educational model was of strategic importance, challenges and need for changes of existing academic structures and the organization in relation to the new formal educational model and possibilities with the model.

Focus group name	Function category	No. of informants	Informants IDs	Duration (time)	Date
A	Higher education institution management	5 (three women/two men)	A1, A2, A3, A4, A5	55 min	17th of Aug. 2020
B	Educational administration	5 (three women/two men)	B1, B2, B3, B4, B5	1 h and 54 min	15th of Sep. 2020
C	Project management	4 (three women/one man)	C1, C2, C3, C4	1 h and 40 min	22nd Sep. 2020
D	Course lecturers	7 (one woman/six men)	D1, D2, D3, D4, D5, D6, D7	1 h and 4 min	23rd Oct. 2020
E	Departmental management and departmental committee	11 (three women/eight men)	E1, E2, E3, E4, E5, E6, E7, E8, E9, E10, E11	57 min	28th Oct. 2020
Tot. five focus groups	*Tot. five function categories*	*Tot. 32 informants*		*Tot. 6 h and 30 min*	

Table 1. Overview of focus group sessions

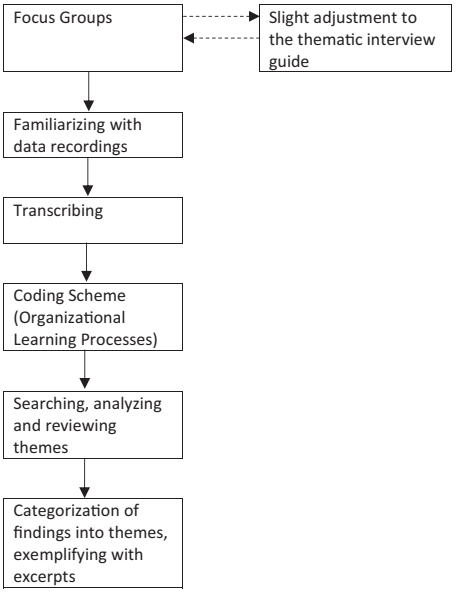
Source: Created by authors

Data analysis

The data from the focus group sessions were analyzed through qualitative content analysis to interpret text from transcripts, coded and categorized into themes (Bell et al., 2019, p. 12); see flow chart in Figure 2.

To overview the rich data, it was necessary to structure the data and at the same time relate the analysis to theories of organizational learning. In the overarching longitudinal study, see Figure 1, previous research demonstrated the need to understand HEI intern learning process when embarking on novel formal education (Hattinger & Eriksson, 2020). Thus, it was important to be able to consider organizational perspectives.

Argote (2013) shows both individual learning and organizational learning in relation to productivity and knowledge transfer between organizations, which harmonizes well with the focus of the case study presented. Therefore, the data were coded with inspiration from organizational learning and the three interrelated subprocesses, i.e. *creating*, *retaining* and *transferring* knowledge (Argote, 2013). Further, *search* is considered another organizational learning subprocess (Huber, 1991). In the coding scheme applied, the subprocesses of *knowledge search* and *knowledge creation* were considered well-suited. However, the subprocess *retaining* was replaced by the word *sustain*, as its meaning may indicate more progress and further development. Also, this vocabulary is in line with the intentions for social sustainability (United Nations, 2022). Finally, the subprocess of *transferring* was replaced by *exchange*, and the reason for this was that transfer can be considered to only move knowledge from one place to another, whereas exchange demonstrates that knowledge is being exchanged, thus facilitating multiways of possibilities for learning. Table 2 describes excerpts categorized into respective coding schemes. The number of excerpts retrieved throughout the coding of the five focus groups was coded in accordance with the



Source: Created by authors

Figure 2.
Flow chart of data collection and data analysis process

Knowledge search	Knowledge creation	Knowledge sustentation	Knowledge exchange
No. of excerpts = 25 Exploration of how the new educational model can be incorporated into existing academic structures. Further, the search for gaining understanding from colleagues in other parts of the organization. There is a struggle to get people on different levels to listen and take an interest. And there is the search to find the correct ways and the right people to be able to move forward	No. of excerpts = 42 Realization and accentuation of possibilities. The importance of the strategic need for the initiative. Challenges with the initiative in relation to the current academic structure and organization are brought forward	No. of excerpts = 35 Exemplifies how over time the new model has been included in a more sustainable way. Simultaneously, there are indications that changing organizational priorities mean that knowledge sustentation sometimes is being reversed and it is necessary to begin anew	No. of excerpts = 27 Highlight that parts of the organization have a thorough understanding of what the initiative involves. Meanwhile, others struggle with understanding this and try to convey how it (maybe negatively) is impacting work processes and structures. Lack of knowledge exchange, joint understanding and forms for improved knowledge exchange is highlighted

Source: Created by authors

Table 2.
Coding scheme with organizational learning subprocesses

organizational learning subprocesses described above and in Table 2. In total, 129 excerpts were identified and divided across each coding category, as shown in Table 2.

The next phase of the thematic analysis process involved searching for, analyzing and reviewing themes to be categorized (Bell et al., 2019 p. 519). In this phase of the process of analyzing the data, the themes were categorized into five overall themes and 15 specific challenges with a total number of 23 excerpts included in the result section.

Results

Different function's overall views of initiatives for formal lifelong HEI education are initially presented. First, five excerpts demonstrate a consensus between all five focus groups, showing that despite informants' different functions, the educational initiative's increasing importance and relevance for the HEI and for society at large is brought forward. Though, depending on the informants' functions different advantages are highlighted, see excerpts below.

> "It is an important part of our (university's) mission that we should listen to society's needs and that we should try to meet them." [A3]

> "As the university says and stands for, in lifelong learning you get the opportunity to continue doing it (learning) even if you have worked for a long time, you can develop your skills." [B3]

> "We can find new research partners; we build up contacts that way." [C2]

> "The most important thing has been that those who have been involved in research projects (from industry) have been able to attend these courses so that we have 'research-connected' both our research projects and courses at the same time." [D3]

> "It is of course strategically important, I mean this lifelong learning and courses for professionals, it is as politically hot as it can get right now." [E8]

The excerpts above show that both societal and political needs are emphasized. The informants highlight; facilitation of individual learning and competence development, the importance and encouragement of networking, the possibilities to find new research partner companies and facilitation of making new research beneficial to industry and society. Despite the positive views there are challenges in organizing the education to suit the nonregular student target group and to administrate internal HEI processes effectively.

Five recurring themes of internal HEI challenges were extracted when analyzing the focus group data. The extracted themes are: *Communication*, *Flexibility*, *Individual perspectives of academic processes*, *Traditional academic processes* and *Organizational structures*. In the next analysis iteration, specific challenges for each of the themes were identified. The themes and their specific challenges are explained and exemplified with excerpts in Table 3. Each of the excerpts is coded according to the coding scheme in Table 2, indicating which organizational knowledge subprocess (search, creation, sustentation or exchange) that respective excerpt relates to. The excerpts demonstrate either the need for more work on specific subprocesses or show positive development of subprocesses.

The excerpts highlight that sometimes it is difficult to define one precise subprocess, as some of the excerpts relate to two or more subprocesses, also pointed out by Miller et al. (2007). Therefore, it is suitable to consider organizational learning as a loop through the different subprocesses, as visualized in Figure 3, inspired by Argote (2013).

Figure 3 brings forth the different processes and places them in a larger system, showing how the processes interact and influence each other continuously, as also stated by e.g. Senge (1990). Within an organization, there are several internal learning loops, both within each subprocess and between subprocesses. This continuous interaction, individually and within groups, leads to the advancement of knowledge on all levels, facilitating organizational learning. Several studies (Garvin, 1993; Argote, 2013; Örtenblad, 2018) discuss organizational learning mostly from an internal organizational perspective, although in this study, the wider perspective is important. By listening, interacting and working together (with other organizations) knowledge exchange is achieved between stakeholders in the surrounding society, and this coproduction of knowledge contributes to both individual and organizational learning for all organizations involved. Each organization thus can further develop the knowledge internally in any of the subprocesses. This continuous development of knowledge creates beneficial conditions for the HEI and the partner companies to become more agile and sustainable in relation to external societal changes since complex problems require collaboration (Pacis & VanWynsberghe, 2020). The following two excerpts confirm the arguments:

> "We (the HEI) establish these connections so that what we are doing becomes relevant." [B3]

> "These are great inputs for the companies not only for training staff, but also for making contacts and learn about new research." [E4]

Following the development and experience gained over 10 years, this study summarizes the practical implications necessary to reach organizational learning when introducing a new educational model. The new model can only be successful if there is a common goal and a joint desire to succeed. This emphasizes joint understanding among all functions, including coproduction with external partners, cooperation among lecturers from different research fields, support from top- and middle-management, and active motivation, support and understanding from educational administration. Results show that vital functions within the organization believed in and realized the importance of the new educational model, which

Table 3.
Themes and their specific challenges, including excerpts for exemplification

Overall themes	Specific challenges	Excerpts related to organizational knowledge subprocesses
Communication	The analysis shows that the theme of communication has the following specific challenges: (1) Reach out/marketing to companies and/or individuals (2) Companies and individuals need to find information about the courses easily (3) Communication internally at the HEI	*Search*: "in the first years, we talked a lot about this, that we would start up so many courses, there were so many new teachers and, like, a lot of uncertainty about how to set it up" [C2] *Search*: "a lot of time was spent chasing course participants by sending sales e-mails. And I don't think we even once thought that the communications department would be able to help us with that" [C2] *Exchange*: "there is one person who is the editor for the education website with all that that entails, and one who is (editor) for the research website and then one who is (editor) for the collaboration website . . . and where does this (new education) fit in?" [B5]
Flexibility	The analysis shows that the theme of flexibility has the following specific challenges: (1) Educational long-term planning (2) Fast technology development, transforming research to education (3) Companies are requesting courses on short notice and when it suits the companies	*Creation*: "our structures say we should be ready a year or a year and a half before. But maybe we also want to be a little flexible, so that we can go from idea to action in three to four months . . . and it doesn't fit in . . . and it's almost become more problematic . . ." [C2] *Sustentation*: "many of our processes are not developed for quickness, but rather for correctness (legislation)" [E10] *Exchange*: "this is opportunity creation through method development and in this way of working we meet new target groups. It is strategically right; we want to reach out further and, also with this strong collaborative dimension" [A2]
Individual perspectives of academic processes	The analysis shows that the theme of individual perspectives of academic processes has the following specific challenges: (1) Different knowledge and experiences (2) Different functions: researchers versus administrators and the aspect of academic freedom	*Sustentation*: "this target group has other demands of the lecturer (needs help out of office hours)" [B2] *Sustentation*: "working with lifelong learning and collaboration in general is not particularly meritorious for the individual. It is unfortunately the case that pure research merits are often highlighted if one is to pursue an academic career. A change in prioritization is required in the promotion and merit systems (nationally)" [E8] *Exchange:* "I think there is a difference in where you are organized, in which department, because some departments are more involved in this type of activity, and there is a greater understanding" [D3]

(*continued*)

Overall themes	Specific challenges	Excerpts related to organizational knowledge subprocesses
	(3) Different perspectives depending on organizational level	
Traditional academic processes	The analysis shows that the theme of traditional academic processes has the following specific challenges: (1) New educational model (2) New target group (3) New way of working, not used to develop and implement courses simultaneously	*Search*: "I think the validation (of applicants real competence) is a challenge" [D3] *Creation*: "these projects challenge several departments, structures, processes, and routines within the higher education institution. And that is a huge challenge" [C4] *Creation*: "it is very important and very exciting, but you must also consider the perspective that it competes with our large regular education" [A3].
Organizational structures	The analysis shows that the theme of organizational structures has the following specific challenges: (1) The educational model encompasses all three academic aspects: research, education and external coproduction (2) The internal organization is not suitable for this new model that requires internal cocreation (3) Need to make allowance for bureaucracy (legislation) and the academic freedom	*Creation*: "do we want to develop new forms of education that fall outside the regular processes? Partly, it takes more time because we are not used to it and it is new, but also it takes time because it is a large manual process because we do not have the support of the usual the systems" [A3] *Sustentation*: "We are already seeing great improvements in that work, in how it is handled process-wise (internal processes)" [A5] *Sustentation*: "I believe that in relation to the question of what we must keep, I think it is useful to have a project organization that drives and guides through administrative processes" [E10]

Source: Created by authors

Table 3.

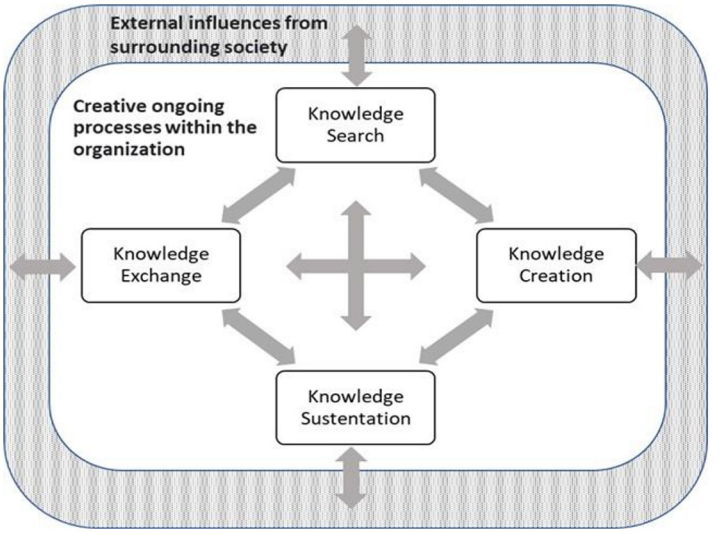


Figure 3.
Creative ongoing processes in a larger system

Source: Created by authors

was fundamental for individual, team and organizational learning and thus resulted in the development of HEI internal processes. To overcome internal challenges, five recurring themes were found in the analysis of the focus group data, namely, communication, flexibility, individual perspectives of academic processes, traditional academic processes and organizational structures. Highlighting these themes and their specific challenges meant gained knowledge and contributed suggestions toward how to overcome the challenges and facilitate faster organizational learning.

The data analysis applied a method based on Argote (2013) and further developed with a fourth subprocess, "search." Additional expansion regarded the subprocesses "retain" and "transfer." The word "retain" was replaced by the word "sustain" to indicate a forward movement of progression and further development, and the word "transfer" was replaced by "exchange" to admit and confirm that knowledge created outside the academic organization also contributes to organizational learning. The theoretical implication of this study thus suggests a developed model for individual and organizational learning in relation to knowledge exchange within and between organizations, consisting of a loop including the subprocesses search, creation, sustention and exchange, see Figure 3.

Discussion

Results are discussed according to the themes and in correlation with organizational learning theories. Interestingly an overarching theme across all functions was found, demonstrating that informants from all levels consider the new formal educational model for lifelong learning important and relevant for future development of the HEI and for society. The HEI has a clear strategy and vision to collaborate with external organizations, especially in its local region. Therefore, it is not surprising that some of the HEI employees expressed views that the initiative is of strategic importance, meaning a consensus across all organizational levels of the new model's relevance for lifelong learning. Thus, from the point

of view of organizational learning, the emphasis on external collaboration is knowledge exchanged throughout the HEI organization.

Communication

The lack of internal communication between functions was brought to light. Especially, project management points out that in the project's initiation they did not realize the importance of close communication with education administration or communications department. Rather, the project management group arranged all administrative and marketing procedures for the new courses. On the other hand, the communications department highlights that they are used to advertising and marketing undergraduate and postgraduate programs and that it has been difficult to locate the right channels for marketing the new educational model. It is not clear how to reach out to this new nonregular student target group, nor is it clear where this new concept fits into marketing. It is education, but with short courses for a new target group, including coproduction between academia and industry, and courses with high research content. To achieve knowledge exchange and to ensure trustful and open communication, the internal communication channels need attention.

Organizational learning perspective: Suggestions for improvements are collaboration through cross-functional teams toward greater facilitation of multifunction knowledge creation, sustentation and exchange (also shown in Lycke & Tano, 2017).

Flexibility

The initiative has been characterized by coproduction between the HEI and the partner companies, focusing on matching industry needs with HEI expertise and resources and designing courses with the flexibility to adhere to professionals working full time (Hattinger & Eriksson, 2020). It has been realized that companies require and expect the courses to be delivered at a faster rate than the HEI, with its long-term planning, is able to offer (Hattinger & Eriksson, 2020). HEIs have relatively long lead times and many steps before approval of course syllabus and advertisement. Due to legal reasons, even minor changes of courses late in the development require substantial changes to many process steps, making it difficult to react. Work plans for lecturers are finalized and filled up almost a year ahead, prioritizing research, undergraduate and postgraduate study programs, leaving little or no space for accommodating new courses.

Organizational learning perspective: The above-described aspects need to be considered when developing internal processes to readily meet rapidly changing competence needs. Also, communication with partner companies is necessary to explain the HEI's limitations in resources and its lack of readiness.

Individual perspectives of academic processes

There is less consensus between different functions on the challenges to handle and prioritize the educational initiative. Top management and departmental management stress the prioritization of the new model, emphasizing long-term possibilities. However, the educational administration and project management group stresses the difficulties of incorporating the new model into existing academic structures. Lecturers do not highlight rigid academic structure as challenging; rather, they focus on challenges such as meeting a new target group of working professionals and moving between campus-based and online course modes. Lecturers point out the importance of transforming research into education to contribute to industry and society development and they emphasize gaining new inspiration and knowledge exchange with course participants.

Organizational learning perspective: Different viewpoints seen from disparate perspectives exemplify that greater knowledge exchange between functions and levels is necessary to reach a sustainable educational model that caters for industry competence needs without corroding other educational programs.

Traditional academic processes

The new educational model is developed through an externally financed project which evolves over time with an ever-changing and increasing development of new courses to adhere to new competence needs. Hence, there needs to be room for testing new course modes, formats and pedagogy. This entails difficulty distributing the courses evenly over time and offering them regularly. The project's evolvement and the steady stream of new courses add pressure to the existing academic processes that are rigid and created to ensure legal aspects rather than responding fast to changes. It, therefore, becomes challenging to incorporate new models into the existing curriculum. The new courses must match available lecture resources, meaning the process of deciding work plans for lecturers on a long-term basis is contested. Issues arise as to whether and how the existing processes can become agile yet sustainable.

Organizational learning perspective: The organization needs to redesign educational processes to simultaneously accommodate different educational variants. By designing explicit, stepwise and joint processes, it is possible to act rapidly without renouncing laws. However, such actions presuppose that the overall education processes function smoothly.

Organizational structure

HEIs are organizations characterized by knowledge intensiveness with highly educated professionals (Mintzberg, 1989), with a historic culture of academic freedom (Ginsberg, 2011). The course lectures stem from engineering sciences typified by problem-solving and applied research in collaboration with external partners. This setting may have facilitated the successful completion of the new courses despite there being large challenges in complying with traditional academic structures. In fact, many of the lecturers highlight the importance of knowledge exchange with industry through the courses. Over the years, the composition of the project management group constantly changed. Individuals came and left the group, and new project roles were introduced when necessary. Additionally, contact people in other areas of the organization, e.g. admissions office, ICT support and communications department where frequently replaced. The project began with a small project group and few, but very engaged, lecturers. Thus, the initiative became dependent on a few individuals who understood the new educational model, which meant that when an individual was replaced, the improvement of processes was started anew, but with a higher knowledge base, i.e. "still confused, but on a higher level." The organization needs to learn how to build sustainable project groups in the future. Thus, it is vital that management on all levels realize that new educational initiatives require prioritization and dedication of resources and that the development needs to take place jointly involving the whole organization.

Organizational learning perspective: It is necessary to strive toward stability and continuity in organizational structures, and trust between individuals is crucial, meaning there must be a "chain-of-trust" throughout the academic processes. Functions inherently have different cultures within the organization, and it is therefore necessary to facilitate knowledge exchange between functions. Organizations which heavily rely on highly educated professionals working independently are hard to change and often have weak management (Mintzberg, 1989). Thus, succeeding with knowledge exchange in such organizations requires gaining trust between individuals and functions and necessitates the involvement of management on all levels.

Concluding discussion

The study demonstrates that the learning organization can be suitable for HEIs if adopted to the circumstances of bureaucracy and knowledge intensive professionals. It is shown that organizational knowledge subprocesses (search, creation, sustentation and exchange) are vital for organizational learning and continuous interaction in cross-functional teams facilitates knowledge sharing. The subprocesses are related (Miller et al., 2007), and enhanced knowledge is created during the knowledge exchange phase, entailing continuous improvement through learning loops.

The result emphasizes that cooperation within an organization and coproduction with external partners (Argote, 2013) must be considered as a large system where all involved – both individuals and organizations – interact and influence each other continuously within the system. The data analysis identified five overall challenges (communication, flexibility, individual perspectives of academic processes, traditional academic processes and organizational structures) and probable explanations of what causes the challenges were presented.

Practical implications from the study identified the success factors: collaboration within cross-functional teams, continuous improvement through learning loops, trustful and open communication both within teams and between teams, but also with external partners, the value of multifunction knowledge exchange, the need for holistic views of processes and understanding of system thinking where different influences affect each other. The success factors correlate well with the five disciplines presented by Senge (1990) for building a learning organization that develops, learns and changes continuously. Örtenblad (2018) presents four versions that characterize a learning organization (learning at work, climate for learning, organizational learning and learning structure) and suggests models adapted to public organizations and knowledge-intensive organizations, thus including HEIs (Örtenblad, 2015). Despite a complex, bureaucratic and professional organization, close cooperation and coproduction with stakeholders can be realized without jeopardizing quality or legislation when management is supportive and organizational learning is adapted, also suggested by Örtenblad & Koris (2014).

Finally, Garvin's (1993) definition of learning organization harmonizes with the result of this study, i.e. a learning organization can create, acquire and transfer knowledge to facilitate change and develop common understandings and new competences. This is highlighted by one of the informants stating:

> "We (the university) work with lifelong learning and want to be eminent in lifelong learning. This is a very important way to excel in the public debate and society in general. . . It's genuine in everything from the small company needs, where individuals want to develop, to truly international structures for business and industrial development. So, I think it's extremely powerful and good and if we can continue with that, it gives leverage to a lot more as well. Wow!" [A2]

Conclusion

It is important that HEIs can meet the continuous and rapid changes of technological advancement with new prospectus in an agile yet sustainable manner. The new formal educational model for competence development investigated is coproduced with partner companies and facilitates knowledge exchange between industry and academia. However, the academic structures and internal processes were not designed for education in this format. Education directed toward competence development is more acutely affected by technological advancement and societal changes, entailing the HEIs need focus on internal processes to shorten lead times of course introductions and strive toward flexibility. This development affects many HEI functions, e.g. administrative support, teaching staff and management.

This case study brings forth specific challenges for HEI and highlights success factors for organizational learning within HEI. The practical implications of the study show that to thrive with new formal educational models it is important that the whole internal HEI organization becomes involved. To attain organizational learning, knowledge needs to be shared between functions, strengthening the benefits of cross-functional teams. The findings emphasize the importance of increased and trustful communication to understand different functions and responsibilities and to realize how impromptu changes in one area may greatly affect other areas. It is important to allow time for activities that facilitate organizational learning, e.g. meetings and communication; management needs to realize that there will be an increased workload for many functions, and it is necessary to develop new functions and processes to facilitate the overlap between new and old structures. Thus, breaking up traditional academic structures needs joint engagement and effort between all HEI functions. The theoretical implication of this study emphasizes organizational learning as a loop with the subprocesses search, creation, sustention and exchange knowledge in a learning loop.

HEIs are often described as bureaucratic organizations heavily relying on educated professionals who work independently, often have weak leadership and are hard to change (Mintzberg, 1989). There are arguments that HEIs need to adapt and further develop the concept of learning organization for complex and bureaucratic structures (Örtenblad & Koris, 2014). HEIs cannot let a wide variety of stakeholders jeopardize rule-following since the bureaucratic structure ensures and maintains fairness, equality and justice for employees, societal and democratic points of view (Örtenblad & Koris, 2014). Therefore, bureaucracy and flexibility must work together when developing new structures for organizational learning, creating committed leadership (Örtenblad & Koris, 2014) and assuring quality assurance (Lycke & Tano, 2017). This study demonstrates that when management on all levels supports necessary changes, there are great opportunities to become a learning organization, and the findings argue that HEI organizations must adapt and create their own unique learning organization.

The complexities brought forward pave the way for further research about organizational changes and learning within HEIs. The case study incorporated five focus groups, with a total of 32 informants supplying rich data. However, a limitation may be the single case study, and thus it is encouraged in future studies to cover multiple cases.

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