CIWIL Current Issues in Work-Integrated Learning
UNIVERSITY WEST
ISSN: 3035-6903 CIWIL 1(2) 2025, p. 39-53 doi.org/10.64775/ciwil.2025.56057

Special Issue
Research Article - Peer reviewed

Co-workership rebooted for digital transformation: highlighting employees' reflection and learning

Linnéa Carlsson[1], Anna Karin Olsson[2], Kristina M. Eriksson[3]

[1]School of Business, Economics and IT, University West, Trollhättan, Sweden, https://oricd.org/0000-0002-7123-3173
[2]School of Business, Economics and IT, University West, Trollhättan, Sweden, https://orcid.org/0000-0002-1991-4588
[3]Department of Engineering Science, University West, Trollhättan, Sweden, https://orcid.org/0000-0001-8962-0924

Corresponding author: Linnéa Carlsson: linnea.carlsson@hv.se

Abstract

This paper addresses how employees' perceptions of organizational and technological aspects of digital transformation in manufacturing contexts contribute to understanding co-workership. To answer this, the research design is rooted in an engaged scholarship approach and work-integrated learning in close collaboration with a case company to understand organisational and digital transformations over time. The study consisted of five focus groups with a total of 25 participants and applied the framework of the co-workership wheel to contribute to the understanding of inclusion of co-workers in digital transformation processes. The results show the need for learning and reflection as an additional conceptual pair and thus propose an extended co-workership wheel for the manufacturing context.

Keywords: Co-workership, Digital transformation, Human-centric, Manufacturing, Work-integrated learning

How to cite
Carlsson, L., Olsson A.K. & Eriksson, K.M. (2025) Co-workership rebooted for digital transformation: Highlighting employees' reflection and learning. *Current Issues in Work-Integrated Learning*, *1*(2), 39-53. DOI: https://doi.org/10.64775/ciwil.2025.56057

Received: 26 June 2025; Revised: 30 October 2025; Accepted: 3 November 2025; Published: 19 December 2025

Introduction

In January 2021, the European Commission announced its policy on Industry 5.0 (Breque et al., 2021), emphasizing the need for greater attention from both practice and research to adopt a human-centric perspective. A human-centric perspective is argued to foreground human needs (Lu et al., 2022) and ensure that technological advancements remain aligned with core human values (Meythaler et al., 2023). In this regard, embracing a human-centric approach has become

CIWIL Current Issues in Work-Integrated Learning
UNIVERSITY WEST
ISSN: 3035-6903 CIWIL 1(2) 2025, p. 39-53 doi.org/10.64775/ciwil.2025.56057

a mark of what is now framed as responsible digital transformation within contemporary manufacturing organisations. Not the least because of the Industry 5.0 (I5.0) paradigm, which emphasizes human-centricity in manufacturing contexts by placing humans at the centre of the manufacturing process, contrasting earlier industrial revolutions (Adel, 2022). Industry 4.0 (I4.0) is considered technology-driven, whereas I5.0 is value-driven, thus complementing each other (Xu et al., 2021). Nahavandi (2019) argued that many of the social challenges associated with the introduction and implementation of digital technologies in the manufacturing industry stem from a lack of a human-centric perspective. Building on this insight, scholars from diverse research fields have explored both the relevance (Lu et al., 2022) and the conceptual foundations (Adel, 2022) of what a human-centric perspective might entail. In light of this, fostering a culture of continuous learning has been argued to be important for ensuring that employees remain agile and able to adapt to technological changes (Li, 2024; Ghobakhloo et al., 2022).

Assumptions about social complexities and the interpretation of what constitutes human-centricity vary, which prompts critical inquiry into how human-centricity can (and should) be engaged in practice. Such as what alternative assumptions can be developed to better understand and operationalize a human-centric perspective? To engage in the development of alternative understandings, scholars have considered the historicity of the organisation, how past practices and values shape present interpretations, as a crucial component of a human-centric perspective (Eriksson et al., 2023; Olsson et al., 2025). In other words, it is argued that the ability to learn from past transformation initiatives is equally important to be able to adapt to technological changes (Eriksson et al., 2022).

To engage in digital transformation, manufacturing organisations are, according to the human-centric perspective, argued to must be able to accommodate human needs (Xu et al., 2021) and frame their interests at the heart (Westerman, 2016) of the production process, shifting from technology-driven progress to value-driven. Eriksson and Hendberg (2021) illustrated how the intended digital transformation was unsuccessful, as the studied organisation was not reflecting on organisational issues beyond digital technologies. Building on this body of work, Eriksson et al. (2022), Carlsson et al. (2022), and Carlsson (2023) conducted in-depth examinations of the social dimensions associated with digital transformation in manufacturing organizations. Their work showed that digital transformation is a holistic process within an organization, engaging employees regardless of level, vertically and horizontally, and crossing levels and functions. This points out the need for an adaptive organisational culture combined with innovation management focusing on learning and competence, imposing innovation, transformative development, and adjustments (Olsson et al., 2025). In a manufacturing context, a human-centric perspective is reasoned to highlight human strengths such as critical thinking, interpretation, innovation, and creativity (Adel, 2022). Riel et al. (2020) argue that by applying a human-centric perspective, employees may be empowered and push creativity to introduce digital initiatives and innovations bottom-up, thus keeping up the speed of digital transformation in organizations.

The aim of this paper is to explore how employees, as co-workers, perceive and understand organisational and technological aspects of digital transformation in a manufacturing context. The research design was rooted in an engaged scholarship approach (Nielsen et al., 2016; Olsson et al., 2021; Van de Ven, 2007) and work-integrated learning (WIL), where the authors engaged and collaborated closely with the case company over time (e.g., Carlsson et al., 2025) to address the challenge of including co-workers in digital transformation processes. The research question addressed is: *How can employees' perceptions of organisational and technological aspects of digital transformation in manufacturing contexts contribute to understanding co-workership?* To address the posed research question, this paper draws on existing co-workership research and applies the co-workership wheel framework. This allowed highlighting the dynamic relation between work and learning while exploring the importance of reflection as a mediating practice (e.g., Areskoug Josefsson et al., 2024).

The rest of this paper is structured as follows: The next section outlines the theoretical framework of co-workership, relating it to the manufacturing context and contemporary industrial paradigms. The following part presents the methodological approach, including the use of the history wall for accessing collective memory and joint reflections on digital initiatives. The subsequent section details the analysis and findings, followed by a discussion of the implications of this expanded understanding of co-workership of digital transformation in a manufacturing context. The paper is wrapped up with a conclusions and reflections on future work.

CIWIL Current Issues in Work-Integrated Learning
UNIVERSITY WEST
ISSN: 3035-6903 CIWIL 1(2) 2025, p. 39-53 doi.org/10.64775/ciwil.2025.56057

Theoretical framework

The manufacturing industry is undergoing a profound transformation driven by the rapid advancement of digital technologies framed through concepts such as the paradigms of Industry 4.0 and Industry 5.0, and smart factories (Grosse et al., 2023; Maddikunta et al., 2022; Rejeb et al., 2024). Historically, manufacturing has been guided by technology-centred logics focused on efficiency, cost control, and quality assurance. The former Tayloristic-inspired view of employees as disposable units is now replaced with a view highlighting human strengths such as learning, reflection, critical thinking, interpretation, innovation, and creativity (Adel, 2022). Emerging research points to the importance of social and organisational dimensions as equally critical in shaping digital transformation (Carlsson, 2023). Such transformations are not only reshaping production processes but also redefining the organisation of work, work practices, roles, and expectations. This places significant emphasis on continuous learning and competence development (Horvat et al., 2024; Oeij et al., 2024) and a learning at work and across working life (Billett, 2024).

In this context, work-integrated learning emerges as a vital mechanism for supporting global engagement and societal development. By embedding learning within everyday work practices, organizations can cultivate not only technical competence but also intercultural awareness, ethical reflection, and collaborative problem-solving skills essential for navigating globalized production networks and contributing to sustainable societal progress. Moreover, understanding how digital transformation is perceived and experienced from within the organization, especially by those directly impacted, can inform inclusive learning strategies that align with broader goals.

Early calls depicted this as digital transformation needing a heart (Westerman, 2016) and a human touch (Bajer, 2017). Linking this to the organization, Warner and Wäger, p. (2019, p. 344) describe digital transformation as “an ongoing process of strategic renewal that uses advances in digital technologies to build capabilities that refresh or replace an organization's business model, collaborative approach, and culture.”. This extends the otherwise technocratic view on digital transformation that is brought forward by, for example, Vial, (2019, p. 118): “a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies”.

External expectations and pressures from sustainability goals to labour market dynamics further complicate how organisations engage with digital technologies (Oeij et al., 2024). In this context, the idea of human-centricity has been proposed as a response to earlier technocratic models, shifting attention to practices such as creativity, critical thinking, empowerment, and continuous upskilling (Adel, 2022; Carlsson et al., 2022; Olsson et al., 2025). To explore what such human-centricity entails at the level of everyday work, this study draws on the concept of co-workership. Co-workership is here described as a form of work-life participation based on shared responsibility, engagement, and trust among co-workers as presented in the model the co-workership wheel introduced in the early 2000 and applied by Andersson et al. in 2021. This model is articulated through four interrelated conceptual pairs: trust and openness, community spirit and cooperation, engagement and meaningfulness, and responsibility and initiative. These dimensions resonate strongly with I5.0 ideals by recognising employees not merely as resources but as co-creators of organisational development. Yet, while the co-workership wheel provides a valuable framework for understanding human-centric participation, it does not fully capture the learning processes and reflective practices that enable co-workers to navigate transformation over time. To address this, we turn to Work-Integrated Learning (WIL).

From a WIL perspective, learning is not an external supplement to work but an inherent part of performing, adapting, and making sense of it (Sunnemark et al., 2024). Reflection allows individuals and groups to interpret their experiences, surface unspoken knowledge, and revise shared understandings (Billett, 2024). Learning, in turn, becomes visible not only in formal training but in everyday interactions such as dialogue and meaning making. Sharing of experiences and reflections further supports learning by articulating, sharing, comparing, and contrasting experiences (Billett 2024). Taken together, these perspectives suggest that reflection and learning are not merely individual competencies but collective capacities essential to sustainable co-workership. By introducing these as a fifth conceptual pair, aiming to expand the co-workership wheel framework to better capture the temporal, interpretive, and developmental demands placed on employees in digitalising industries. In doing so, a WIL-informed lens was applied for understanding how human-centricity can be enacted not only through values but through everyday learning practices in the workplace.

CIWIL Current Issues in Work-Integrated Learning
UNIVERSITY WEST
ISSN: 3035-6903 CIWIL 1(2) 2025, p. 39-53 doi.org/10.64775/ciwil.2025.56057

Co-workership research

The concept of co-workership, originating from Scandinavian work life, has been applied more widely since the 1990s to understand how employees, regardless of level or function, share a vision of the advantage of employee autonomy and participation in decision-making in decentralized structures (Andersson et al., 2021; Kilhammar, 2018).The application of the concept of co-workership is reflecting employees' strong positions in a Scandinavian context based on labour regulations and unions (Larsson et al., 2022). Thus, studies on co-workership beyond the Scandinavian region remain limited, underscoring the need to explore how models of collaborative work culture adapt to and influence technologically driven change in manufacturing environments. Closely related concepts to co-workership are followership (Collinson, 2006) and empowerment (Riel et al., 2020). Followership emphasizes hierarchy, and the importance and relationship between employees and leaders. Co-workership, however, has a broader scope, incorporating employees' taking on responsibilities, the general relationship and role between co-workers and how this affects the organisation (Kilhammar & Ellström, 2015). Furthermore, co-workership is firmly based on flatter organizations, cross-functional collaboration, employee autonomy and contribution, and employee inclusion in decision-making (Kilhammar & Ellström, 2015). In Swedish manufacturing industries, the application of co-workership is challenged by the global markets, ownerships, and employees' international mobility (Kilhammar & Ellström, 2015).

The framework the co-workership wheel was initiated in a Swedish context in the beginning of 2000 by Hällsten and Tengblad (2006). Andersson et al. (2021) applied the co-workership wheel in a healthcare context and this was further elaborated in the manufacturing context in Carlsson et al. (2022) and Olsson et al. (2025). The co-workership wheel is here applied to highlight the human-centric perspective in digital transformation. The co-workership wheel is a theoretical framework of four conceptual pairs (Andersson et al., 2021) applied to bring out employees' engagement: trust and openness, community spirit and Cooperation, engagement and meaningfulness, and responsibility and initiative, as illustrated in Figure 1.

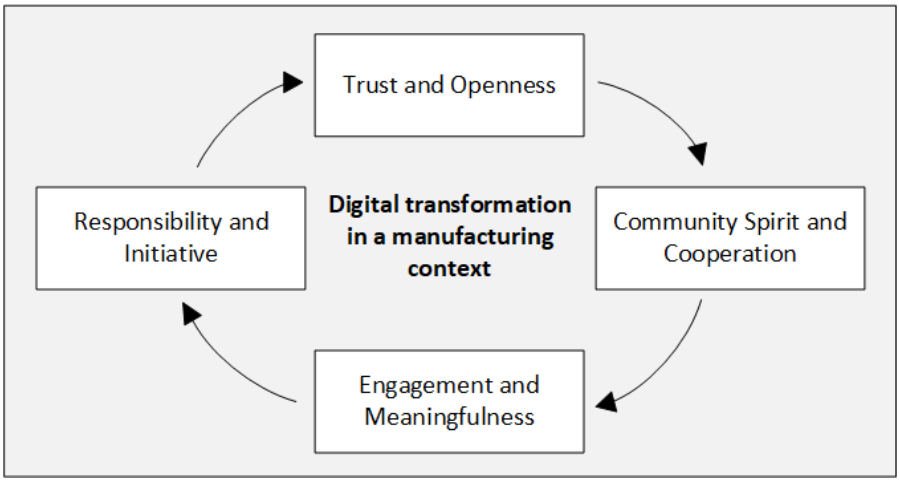

Figure 1: Illustration of the co-workership wheel by Olsson et al. (2025, p.68) inspired by Andersson et al. (2021)

The first pair, *trust and openness*, refers to co-workers' relationship to one another and the organization, i.e., is trust given to all employees in their responsible autonomy and entrustment in tasks. The second pair, *community spirit and cooperation*, refers to what can be described as a friendly spirit within an organization. It is not equal to culture, but the conceptual pair could resemble a building block of an open and collaborative culture. The third pair, *engagement and meaningfulness*, is the experienced purpose among employees in given tasks and responsible autonomy. Are tasks given because one is entrusted to deliver, or are tasks given on other premises? The fourth and final pair, *responsibility and initiative*, refers to the engagement given to employees and entrusted to them to take the initiative.

CIWIL Current Issues in Work-Integrated Learning
UNIVERSITY WEST
ISSN: 3035-6903 CIWIL 1(2) 2025, p. 39-53 doi.org/10.64775/ciwil.2025.56057

Research methodology

This focus group study (2022-2023) is part of a longitudinal case study (2020-2023), and the collaboration and mutual exploration of endeavors have been studied over time, e.g., (Carlsson et al., 2022; Eriksson et al., 2022, 2023, 2024). This engagement over time was the brickwork when approaching the Case Company (CC) as it encouraged active participation in formulating and designing the focus groups (Eriksson et al., 2025). CC manufactures and performs maintenance of large-sized, heavy, high-quality, and cutting-edge components in a national and international supply chain of manufacturing units as part of a large global company. CC has a hierarchical organisational structure, operating at a centralized office level supported by the business functions. The decision-making of digitalization initiatives is scattered across manufacturing units, with advanced units and units in the early phases of digital transformation. The CC manufacturing unit engaged in this case study has low levels of digitalization and automation with a high degree of manual work, e.g., welding operations. For this reason, the previous contact with CC was essential to facilitate a trusting space when discussing the concurrent implementation and ambivalent use of analog and/or digital methods for production improvement and advancement.

The historicity with CC meant that the engaged scholarship approach was building on a back-and-forth relation with theory and practice, and it allowed participants to give voice to their understanding and interpretation (Vidgen & Braa, 1997) of ongoing production improvement initiatives related to digital transformation. When designing the focus groups, emphasis was placed on allowing both present and retrospective perspectives on digital initiatives to be captured.

Data generation and focus group design

The history wall approach has inspired the focus group design to capture informants' perception of digital transformation over time (Karanasios, 2018). In previous studies of CC (Carlsson et al., 2022; Eriksson et al., 2022, 2023), informants had been emphasizing past events related to digitalization. Therefore, the focus groups were designed to identify past events and digital initiatives, without labelling them as good or bad, considered to impact CC's digital transformation. As such, focus groups were run in a workshop format where participants created a history wall, i.e., a visual representation of organisational initiatives over time (Wheeler & Thomas, 2011). In addition, focus groups gave voice to participants' views and offered rich opportunities to gather data as participants shared, jointly reflected, and built on their interpretations of a context or phenomenon (Rutledge et al., 2023). Hence, an essential strength of this approach was the possibility for participants to reflect and develop ideas around digital transformation together, yet individual and group opinions may change and develop during the group's duration (Smithson, 2000).

CC supported sampling participants from other functions, considering a range of gender, employed time, and work tasks to reflect the company's distribution. The study incorporated five focus groups and was performed from April 2022 through May 2023, with 25 participants from different job functions to encompass the entire CC (see Table 1). The focus groups were divided into functions, including shop floor team leaders, shop floor operators, support functions, technical management, and manufacturing engineers.

Table 1: Overview of focus groups and participants.

Function categorization	Focus group name	Participants IDs	Duration (hours)
Shop floor team leaders	F1	F1.1, F1.2, F1.3, F1.4, F1.5	1.7
Shop floor operators	F2	F2.1, F2.2, F2.3, F2.4	1.6
Support functions incl. SCM	F3	F3.1, F3.2, F3.3, F3.4, F3.5, F3.6	1.9
Technical management	F4	F4.1, F4.2, F4.3, F4.4	1.4
Manufacturing engineers	F5	F5.1, F5.2, F5.3, F5.4, F5.5, F5.6	1.5
Tot. 5 Function categories	**Tot. 5 focus groups**	**Tot. 25 participants**	**Tot. 8.1 hours**

The focus group sessions were designed with two phases, each taking approximately 1.5-2 hours to complete. In the first phase, participants were welcomed and presented with the outline of the focus group. The participants were asked to consider what initiatives had occurred, either directed towards digitalization or, digital initiatives or other organisational changes between 2015 and 2023. The reason for choosing 2015 as a starting point was based on previous studies at CC. These results indicated that from 2015 onwards, various digital initiatives, as well as organisational changes, took place.

CIWIL Current Issues in Work-Integrated Learning
UNIVERSITY WEST
ISSN: 3035-6903 CIWIL 1(2) 2025, p. 39-53 doi.org/10.64775/ciwil.2025.56057

During this first phase, participants sat in a half circle around a conference table. Participants wrote initiatives on a long rolled-out paper that all participants could reach and write on, i.e., a history wall overlooking participants' interpreted initiatives, see Figure 2.

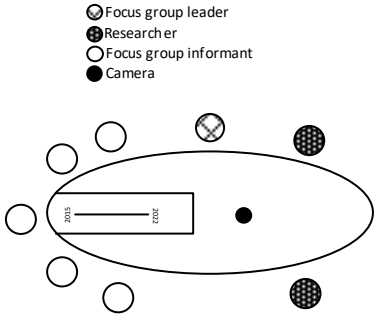

Figure 2: Overview of focus group set-up parts one and two (Carlsson, 2023, p. 42).

One of the researchers, the focus group leader, circled the table and moderated the focus group to limit the risk of single participants dominating the discussions. The other researchers focused on notetaking and video and audio recording (with informed signed consent), occasionally breaking in with follow-up questions. The main idea was to facilitate a reflective discussion on historical events rather than probing participants. In the second part of the focus group, participants remained seated around the now scribbled history wall. The focus group leader then instructed participants to review all scribbled initiatives, events, or other notes if they have influenced the shared Trust and Openness, Community Spirit and Cooperation, Engagement and Meaningfulness, and Responsibility and Initiative. To review, participants were asked to mark each scribbled initiative, event, or other note with a plus (+) or minus (-) sign. Participants were allowed to, once again, reflect together but also encouraged to write down what they individually experienced and believed.

Analysis and findings

This section presents the findings from the analysis of the history wall timeline and the dialogue excerpts from the focus groups. The analytical framework is based on the four conceptual pairs of co-workership developed by Andersson et al. (2021): *trust and openness, community spirit and cooperation, engagement and meaningfulness,* and *responsibility and initiative*. These four pairs served as sensitising concepts during the initial coding of the material. However, through the process of analysing and combining the timeline with the rich dialogue excerpts, it became clear that not all employee experiences and perspectives were fully captured by the original model. Particularly, co-workers' descriptions of how they made sense of past experiences, dealt with change, and tried to preserve or pass on knowledge pointed toward another dimension of co-workership. This led us to identify a fifth conceptual pair: *reflection and learning.* This pair emerged from the dialogues surrounding the focus groups. The analytical process was conducted in five steps.

Firstly, researchers rolled out all five history walls that the participants created during the focus group sessions and counted all the scribbled initiatives for each focus group. The reasoning for doing this was to visualise the numbers and scope of initiatives perceived by participants. The total number of identified initiatives by the five focus groups was 128 (see Table 2). Examples of initiatives noted by participants are: advanced planning system; management execution systems; re-occurring change of top management; computers; padlets; digital flow boards; 3D measurement software; lean coordinator; lack of IT support staff; new light in factory shop floor; 3D printing; digital screens to support shop floor operators; structural re-organisations; lack of communication; keeping competence; training new staff; automated storage. As seen, the identified initiatives vary highly in terms of technology focus and application. Secondly, annotated initiatives were coded for each history wall to formulate initial categories to oversee participants' focus. Initial categories were rough in nature to preferably include rather than exclude: digital; machines; software; change of management; employee turnover; structural organisational changes; culture and values; ergonomic; new contracts/products; market demand; Covid-19 pandemic.

CIWIL Current Issues in Work-Integrated Learning
UNIVERSITY WEST
ISSN: 3035-6903 CIWIL 1(2) 2025, p. 39-53 doi.org/10.64775/ciwil.2025.56057

Table 2: Number of initiatives distributed across categories.

Focus group name	Number of initiatives	Number of initiatives across categories
A	26	Tech. (14); Org. (7); Ext. impact (5)
B	15	Tech. (6); Org. (8); Ext. impact (1)
C	25	Tech. (14); Org. (8); Ext. impact (3)
D	41	Tech (12); Org. (18); Ext. impact (11)
E	21	Tech (18); Org. (1); Ext. impact (2)
Tot. no. = 5	**Tot. no. = 128**	**Tot. Tech. (64); Org. (42); Ext. impact (22)**

Thirdly, the initial categories were refined and grouped into three categories, demonstrating the overall content of the annotated initiatives in the focus groups. The initiatives (see Table 2) focused on Technology (64 initiatives), Organisation (42 initiatives), and External impact (22 initiatives). As participants were encouraged to discuss throughout the focus group sessions, the 128 initiatives also generated descriptive dialogical excerpts.

Fourthly, the three categories were compared and cross-tabulated with the four conceptual pairs to oversee the distribution of positive and negative reactions to the activities on the history walls (see Table 3). Table 3 visualizes that the total number of negative reactions category-wise was 269 and the total number of positive was 442.

Table 3: Distribution of positive and negative reactions to the initiatives on the history wall.

	Trust and openness	Community spirit and Cooperation	Engagement and meaningfulness	Responsibility and initiative	**Tot. per category**
Technology	(-) = 21 (+) = 111	(-) = 31 (+) = 49	(-) = 23 (+) = 73	(-) = 24 (+) = 85	**(-) = 99** **(+) = 318**
Organization	(-) = 45 (+) = 14	(-) = 20 (+) = 8	(-) = 9 (+) = 16	(-) = 27 (+) = 26	**(-) = 101** **(+) = 64**
External impact	(-) = 31 (+) = 10	(-) = 15 (+) = 9	(-) = 13 (+) = 17	(-) = 10 (+) = 24	**(-) = 69** **(+) = 60**
Total per conceptual pair	**(-) = 97** **(+) = 135**	**(-) = 66** **(+) =66**	**(-) = 45** **(+) = 106**	**(-) = 61** **(+) = 135**	

The category Technology generated the most significant number of reactions and a heavy overweight on positive ones (318 positive and 99 negative), indicating that co-workers had a positive interpretation of new technology that is here relative to digital transformation. The second highest score can be seen in the category Organization, where the negative reactions were 101 (compared to 64 positive). Here, often referred by co-workers, to initiatives related to organisational and management changes. The category external impact has a significant lower number of reactions than the two other categories (69 negative and 60 positive). This could be external forces that the co-workers interpreted to have no effect on initiatives or no say in, e.g., COVID-19 and company fusions.

Considering each conceptual pair in the co-workership wheel (see Table 3), trust and openness show a fairly equal distribution of positive and negative reactions compared to the other pairs. One reason could be that participants found it easier to relate to what trust and openness represent. Community spirit and cooperation are outliers because they do not have as many positive (66) or negative (66) reactions related to them. In addition, they are also equally distributed. One explanation could be that community spirit and cooperation are often related to organisational structures and levels. Co-workers often spoke of a strong community spirit and cooperation within the same organisational level and functions; however, cross-organisational work was identified to be a challenge. Engagement and meaningfulness showed a heavy overweight on positive reactions (106), showing that either co-workers experience a high level of engagement and meaningfulness or have a strong desire for it. For instance, co-workers described instances with limited trust and openness, often related to a lack of transparency. These instances could reflect a desire for engagement and meaningfulness. Similarly, responsibility and initiative greatly weigh positive reactions (135). Given that cross-organisational work was identified as

CIWIL Current Issues in Work-Integrated Learning
UNIVERSITY WEST
ISSN: 3035-6903 CIWIL 1(2) 2025, p. 39-53 doi.org/10.64775/ciwil.2025.56057

a challenge, it is not surprising that responsibility and initiative had a positive weight, as co-workers witnessed that they felt responsible within their own function or team.

The fifth and final step of the analysis moved beyond cataloguing and categorising initiatives (see Table 3) along the timeline to a closer reading of the dialogue excerpts generated in the focus-group discussions. While the co-workership wheel's original conceptual pairs guided the conversations, the analysis of the excerpts revealed recurring concerns that extended beyond the framework. In particular, participants repeatedly returned to issues of reflection and learning, which together captured dimensions of co-workership not fully represented by the initial pairs. These themes, illustrated in Tables 4a and 4b, point to organisational processes of knowledge continuity, collective sense-making, and skill development that cut across the initiatives noted by participants under discussion.

As shown in the four selected dialogues in Table 4a, participants emphasized the importance of reflection to make sense of ongoing changes, particularly related to *limited support,* in the context of *fragile knowledge structures and recurring staff turnover*. They pointed to the loss of *critical competence* when key individuals left, the challenges of working with temporary consultants, and the *absence of systematic knowledge transfer* in relation to digital initiatives. Reflection here was not limited to individual contemplation but described as a shared process of questioning, problem-solving, and surfacing long-standing issues. The workshops ended up being a positive activity that allowed for such reflection. However, participants also noted a lack of organisational support and time for such reflection, often leaving them to rely on emergency solutions or informal exchanges with trusted co-workers. In this sense, reflection was articulated both as a cultural need and as an organisational gap, with insufficient structures in place to sustain it.

CIWIL Current Issues in Work-Integrated Learning
UNIVERSITY WEST
ISSN: 3035-6903 CIWIL 1(2) 2025, p. 39-53 doi.org/10.64775/ciwil.2025.56057

Table 4a: Dialogue excerpts highlighting *Reflection*

Theme	Dialogue Excerpts - Reflection
Limited support	F1.3 [The problem is] not exactly the digitalization itself. That is not what I see that has made it harder or triggers us apart. But it is something else. It's the whole thing that has pulled it apart. Then there is the fact that we may not have the skills in place. F1.5 Yes, we don't have data support at the company here. F1.2 We should write that down! When the support left, all the help with IT stuff disappeared. F1.4 It was much easier! She quit three or four years ago. F1.2 She left before Covid, it was probably four or five years ago. [writes on timeline] F1.2 We have no one here to help us.
Fragile knowledge structures and recurring staff turnover	F5.4 Programming skills are needed. F5.1 But also to pass on the legacy. It doesn't matter what it is about, but there are many people who have one-man jobs down here in the organization, at all levels. It is very fragile. If you handpick a few and it crumbles. F5.2 It is generally fragile. F5.4 We do have many temporary hired consultants. They come in and then they are trained and then they become permanently employed somewhere else. F5.1 We can take examples of the machines down here both with single competence. It is programming where one-man knowledge sits there then. Then if we remove one, it's completely still down there, and that's what we've had for the last two weeks. Nobody can do programming. We knew how to do that before. F5.1 We lack people and knowledge. Knowledge is lost all the time. F5.3 Yes, all the time. We are drained of knowledge from the large reorganisation and forward until today.
Critical competence	F1.2 We help each other here down on the workshop floor. I can go to him [points to another participant] and ask so that we can fix stuff like that. We have worked for so many years and know each other well. There are often changes in technologies, but we try to tell them [the managers] that this is causing problems for us. But they completely screw us up. No one listens to us. But what are we going to do? We must deliver. We are good at delivering. F1.3 We are good at making emergency solutions so that we can get things going. But I know issues that remain that we have had for over ten years. Which they haven't caught on to. It still hasn't changed. Then they've stopped [with a specific new technology] and started somewhere else and then a new technician comes and must get into the stuff to understand what the concern is and that alone can take six months or a year before he understands the structure of a product. F1.2 When he understands, he is replaced or leaves. F1.3 Then they change tasks between us and then the technicians jump between the different ones here. Then they learn a little here and a little there, but they don't have time to finish and learn fully. But they know little about everything. F1.2 I have worked here for many years, and I have not received help from any technician or that any technician taught me. I have learned new technologies. I have taught each technician everything as they came to me.
Absence of systematic knowledge transfer	F5.1 The percentage of consultants is far too high for an organisation like this with special knowledge. It takes many, many years to learn to know certain pieces. F5.4 It will be someone else's job to teach. It takes one to teach another. F5.3 Yes, I mean how many technicians have we had in the last five years at the various? Is it twenty or? F5.3 Yes, it is our job to teach others and being supportive. F5.1 Yes, that is how we ourselves received the inheritance. F5.3 There will be no continuity on it.

Table 4b shows four dialogues of how participants positioned learning as an everyday, relational activity as well as a structural challenge. On the one hand, co-workers described strong norms of helping one another, *exchanging skills across functions*, and mentoring newcomers. These practices were seen as positive shifts from earlier times when knowledge was closely guarded. On the other hand, participants stressed the *absence of formal processes to support learning*, particularly for new staff or for developing specialized competencies in relation to digital transformation. They expressed concerns that time pressures, *fragmented initiatives*, and a *lack of recognition made learning difficult to prioritize*, despite widespread willingness to teach and share knowledge. Thus, learning was framed as both a lived practice embedded in daily collaboration and as an *organisational condition* that required clearer structures, resources, and acknowledgment.

CIWIL Current Issues in Work-Integrated Learning
UNIVERSITY WEST
ISSN: 3035-6903 CIWIL 1(2) 2025, p. 39-53 doi.org/10.64775/ciwil.2025.56057

Table 4b: Dialogue excerpts highlighting *Learning*

Learning	
Exchanging skills across functions	F3.5: You are more inclined to share your knowledge in production. In the old days, the machines were named after the person who stood there. F3.3: It has been a journey since we were acquired [by CC]. When I started, not many people shared their knowledge. You had to figure out how to manufacture certain things yourself and it has changed all the time, so it is better today,because then it was a single competence in many details and only certain people made them and if they weren't here, no one made them.
Absence of formal processes to support learning	F1.3. Mentorship both for the technicians and for us [operators]. … For technicians, for us, and for all new ones. F1.4 There must be a process for that, but we have never seen one. A checklist for new staff. F1.5 It can take a very long time. In my department, there may be items that we haven't manufactured in six years. Then you must teach someone new this job. When you may not have done it that many times yourself. It is very difficult. F1.5 No, many jobs are craftsmanship, and you need knowledge there. For us, it is several years [of training]. F1.3 Then it depends on what kind of people come in. We have those who learn the basics and the mindset in, say three months. Then we have those who are here for three years and never learn. So, it depends entirely on what kind of people it is. F1.5 It doesn't really matter if they have worked as a welder before as long as they are hungry and want to absorb information. F1.3 A good drive and a willingness to learn.
Lack of recognition made learning difficult to prioritize	F2.2: No, but what I've heard about management is that if you're very pushy - and maybe don't agree with the management, you slip outside, get frozen out. Then we had someone on the floor who was very competent - very good - who said what he thought, and it also became a process of banishment, and he resigned. F2.1: Still, they say that you don't help the company to develop. At least when it comes to salary negotiation. F2.2: People on the floor think that these people [who dared to question] have been very good. F2.3 Things end up outside a competence area, then you must try to acquire competence. For many it is very difficult. F2.3 It feels like it has become the same on the workshop floor. The environment everywhere. It's very important how it goes, but then how you feel or what skills you have doesn't matter. There is a lack of two-way communication. F2.4: And no structure!
Organisational conditions	F4.4: Is learning the same as education, because I think I feel secure in that if I want to get someone trained in above all digitalisation whatever it may be, then top management would never say no. F4.2: There is a lot of talk about giving opportunities to learn. But if you look at production staff now, for example, a big threat is that you go very hard on earnings, i.e., profit to feed hours, which means that we won't be able to spend as much on education. F4.4: I also completely agree with you there. There will be a small gap between production staff versus white-collar workers. F4.1: And there, too, I have targets for hours for my staff. Education for example then it doesn't give me an income . What are goals with income? F4.2: The goal that has been set now, it is so tight that it is only against merit, so we cannot really develop the staff immediately. We will stagnate if we continue like this for too long. F4.4 There are opportunities for as much education as possible, but we don't have the opportunity to attend them because we don't have time.

Tables 4a and 4b provide excerpts from the focus group discussions that specifically highlight dialogue around reflection and learning. Across both the timeline activities and the excerpts, co-workers repeatedly returned to concerns about knowledge continuity, organisational conditions, sense-making over time, and the need for both informal and structured learning processes. Participants also emphasized that digital transformation is difficult to navigate when communication and cooperation are limited, underscoring the need for trust in digital technologies, employee engagement, and transparency across initiatives. To avoid siloed efforts and support informed decision-making, participants argued for more thorough evaluation of digital initiatives and greater inclusion in reflective processes. Taken together, these insights point to

CIWIL Current Issues in Work-Integrated Learning
UNIVERSITY WEST
ISSN: 3035-6903 CIWIL 1(2) 2025, p. 39-53 doi.org/10.64775/ciwil.2025.56057

reflection and learning as a fifth conceptual pair, see Figure 3. A pair that foregrounds these needs as equal in importance, rather than leaving them as background mechanisms to the other pairs.

Figure 3: Extended co-workership wheel: Reflection and Learning as a pair (Authors)

Figure 3, hence, showcases an extended co-workership wheel with the addition of *reflection* and *learning* as a fifth conceptual pair. While the co-workership wheel (Andersson et al., 2021) has provided valuable insights within its original scope in several contexts, it exhibits limitations in capturing the full complexity of the studied phenomenon related to digital transformation in a manufacturing context. With the additional fifth pair, the necessity of reflection and learning related to the co-workership wheel is argued to be more promptly visible.

Discussion

This study set out to explore how employees, as co-workers, perceive and understand the organisational and technological aspects of digital transformation within a manufacturing context. The research design was grounded in an engaged scholarship approach combined with principles of work-integrated learning (WIL). Through close and sustained collaboration with the case company, the study addressed the challenge of meaningfully involving co-workers in digital transformation processes. This approach enabled a focus on the dynamic interplay between work and learning, emphasizing reflection as a mediating practice in organisational development (Areskoug Josefsson et al., 2024). In the discussion, the findings are interpreted with particular attention to how employees' perceptions of organisational and technological change can deepen the understanding of co-workership and its role in facilitating digital transformation in manufacturing.

An essential strength of the approach lies in the dialogical nature of the focus group method (Karanasios, 2018), which offers participants the opportunity to reflect and develop ideas together, constructing individual and group opinions that may change and evolve during the focus group (Smithson, 2000). This dynamic was evident across the five focus groups, where the process of joint meaning-making revealed not only differences in experiences, but also collective insight into barriers and enablers of learning in practice. Reflection, in this sense, was not merely a backward-looking exercise but an active negotiation of how to move forward. The co-workership wheel (Andersson et al., 2021) provides a valuable framework for understanding workplace dynamics, centering on the four conceptual pairs of *trust and openness*, *community spirit and cooperation*, *engagement and meaningfulness*, and *responsibility and initiative*. However, the findings presented show that these pairs alone do not fully capture the experiences and needs of employees navigating complex organisational and technological change.

CIWIL Current Issues in Work-Integrated Learning
UNIVERSITY WEST
ISSN: 3035-6903 CIWIL 1(2) 2025, p. 39-53 doi.org/10.64775/ciwil.2025.56057

The empirical material shows that reflection and learning were not only present in co-workers' narratives but also seen as essential to managing change and maintaining continuity (Kilhammar, 2011; Kilhammar & Ellström, 2015). Co-workers repeatedly emphasized the importance of mentorship, informal knowledge sharing, and the need to retain experiential knowledge within the organization. At the same time, they expressed frustration at the absence of systematic structures for competence development and reflective learning. For example, high staff turnover, fragmented responsibilities, and "one-person jobs" made it difficult to preserve and share knowledge. Co-workers reported that much of the learning occurred "on the fly" or through personal initiative, with limited support from organisational systems. This reflects a misalignment between the organization's stated emphasis on development and the conditions under which employees are expected to learn and adapt.

Reflection, too, was often informal and reactive rather than intentional and supported. Participants noted that follow-up was often lacking and that lessons learned from previous initiatives were not always carried forward. The history wall method helped surface how co-workers remembered and made sense of past events, and how they connected these memories to current challenges. This illustrates how reflection is intertwined with learning and how both are essential to navigating a constantly changing environment. The role of co-workers as knowledge carriers, often across both organisational and technological transformations, highlights the significance of situated learning and shared reflection for sustaining workplace functionality. This supports what Sunnemark et al. (2024) refer to as an inherent part of work-integrated learning, i.e., learning is not a supplement but a necessity of co-workers' everyday working life.

Against this backdrop, reflection and learning emerge not only as activities but as necessary conditions for co-workership amid digital transformation in a manufacturing context. Thus, the novel conceptual pair of *reflection and learning* introduced here complements the original four pairs in that it explicitly addresses the temporal and developmental dimensions of co-workership. While trust and openness, or community spirit and cooperation, describe qualities of relationships and collaboration (Andersson et al., 2021; Kilhammar & Ellström, 2015), reflection and learning focus on how knowledge is built, re-evaluated, and transferred (Billett, 2024; Billett & Choy, 2013). That is between individuals and the roles of co-workers. As seen at CC, it also emphasizes the need for organizations to provide space and structure for reflection, and for learning to be shared, rather than individualized and isolated. A limitation, noted by co-workers, is that digital initiatives often are characterized by a top-down approach, and instrumental change, hence failing to tap into the reflective and experiential knowledge already present in the workforce.

This proposed addition aligns with the broader ambitions of Industry 5.0 (Adel, 2022; Müller, 2020), where innovation is understood not only in terms of technological capability but also in terms of human capability; how people make sense of, adapt to, and influence digital transformation (Ghobakhloo et al., 2022). *Reflection and learning* (as a conceptual pair) is, in light of this, one way to support this shift by making visible the interpretive and cumulative aspects of co-workers' engagement.

In summary, the addition of *reflection and learning* as a conceptual pair in the co-workership wheel extends its relevance for understanding human-centric digital transformation. It highlights the importance of awareness, interpretive flexibility, and knowledge continuity, factors that are here argued essential for co-workers not only to participate in but also to participate in shaping transformation; one that recognizes employees not only as contributors to productivity but also as reflective agents engaged in continuous learning.

Conclusions

This paper provides deeper insight into how employees perceive organisational and technological aspects of digital transformation, using a historically grounded focus group methodology. An additional contribution was the re-interpretation and extension of the co-workership wheel to capture reflection and learning. This revised co-workership wheel, framed in a manufacturing context, visualises a more holistic approach to co-workership related to organisational and technological changes. This study acknowledges that digital transformation is more conditioned by the organisational aspects rather than the technological advancements. This indicates that co-workers need space and opportunities for reflection and learning in a continuous digital transformation. Notably, digital transformation is no longer merely about technological development but increasingly about how to navigate the organisation and co-workers in a complex and unpredictable world. Thus, co-workership, as seen herein, needs to be rebooted for digital transformation to highlight employees' reflection and learning.

CIWIL Current Issues in Work-Integrated Learning
UNIVERSITY WEST
ISSN: 3035-6903 CIWIL 1(2) 2025, p. 39-53 doi.org/10.64775/ciwil.2025.56057

This longitudinal study, based on five focus groups and 25 participants, offers valuable insights into the topic. However, given the study's explorative approach, future research is encouraged to build on these initial findings using broader samples and complementary methods to deepen understanding and validate emerging patterns by taking an interdisciplinary approach to further explore the importance of co-workership in the ongoing transition towards Industry 5.0. To do so, future research is encouraged to develop WIL-inspired approaches related to the manufacturing context.

Acknowledgements

The study was carried out within the AHIL-project, Artificial and Human Intelligence through Learning, funded by the Swedish Knowledge Foundation, Grant number 20200035*, and University West.

Declaration of interest

The authors declare no competing interests.

References

Adel, A. (2022). Future of industry 5.0 in society: human-centric solutions, challenges and prospective research areas. *Journal of Cloud Computing*, *11*(1). https://doi.org/10.1186/s13677-022-00314-5

Andersson, T., Stockhult, H., & Tengblad, S. (2021). Strategies for co-workership retention. *Human Resource Development International*, 425–445. https://doi.org/10.1080/13678868.2020.1840845

Areskoug Josefsson, K., West, U., & Daniel Masterson, S. (2024). A bibliographic review of work-integrated learning research. *International Journal of Work-Integrated Learning*, *25*(4). https://osf.io/hrcsf

Bajer, J. (2017). Digital transformation needs the human touch. *Strategic HR Review, 16*(2), 91-92. https://doi.org/10.1108/SHR-02-2017-0011

Billett, S. (2024). Learning across working life: educative experiences and individuals' participation. *Studies in Continuing Education*, *46*(2), 143–159. https://doi.org/10.1080/0158037X.2023.2221650

Billett, S., & Choy, S. (2013). Workplace participatory practices: Conceptualising workplaces as learning environments. *Journal of Workplace Learning*, *25*(4), 264–276. https://doi.org/10.1108/13665620410550295

Breque, M., De Nul, L., & Petridis, A. (2021). *Industry 5.0 - Towards a sustainable, humancentric and resilient European industry*. https://doi.org/10.2777/308407

Carlsson, L. (2023). *Social Aspects of Strategizing Industrial Digitalization* (Dissertation, Issue 60). University West.

Carlsson, L., Eriksson, K., & Olsson, A. K. (2022). Taking Responsibility for Industrial Digitalization: Navigating Organizational Challenges. *Sustainability*, *14*(2). https://doi.org/https://doi.org/10.3390/su14020866

Carlsson, L., Olsson, A. K., & Eriksson, K. M. (in press). Reflections on the emergence of human-centricity: Lessons learned from a manufacturing narrative. In *IFIP WG 8.6 International Working Conference on Digital Adoption, Diffusion and Innovation in the Augmented and Digital Society*.*3rd September 2025, Online.*

Collinson, D. (2006). Rethinking followership: A post-structuralist analysis of follower identities. *The Leadership Quarterly*, *17*(2), 179–189. https://doi.org/https://doi.org/10.1016/j.leaqua.2005.12.005

Eriksson, K., & Hendberg, T. (2021). A Case Study Initiating Discrete Event Simulation as a Tool for Decision Making in I4.0 Manufacturing. *International Conference on Decision Support System Technology*, 84–96. https://doi.org/10.1007/978-3-030-73976-8_7

Eriksson, K. M., Carlsson, L., & Olsson, A. K. (2022). To digitalize or not ? Navigating and merging human - and technology perspectives in production planning and control. *The International Journal of Advanced Manufacturing Technology*, *122*, 4365–4373. https://doi.org/10.1007/s00170-022-09874-x

Eriksson, K. M., Carlsson, L., & Olsson, A. K. (2023). Exploring Socially Sustainable, Smart Manufacturing – Building Bridges Over Troubled Waters. In *Flexible Automation and Intelligent Manufacturing: Establishing Bridges for More Sustainable Manufacturing Systems* (Issue August, pp. 833–841). Springer, Cham. https://doi.org/https://doi.org/10.1007/978-3-031-38165-2_96

Eriksson, K. M., Olsson, A. K., & Carlsson, L. (2024). Beyond lean production practices and Industry 4.0 technologies toward the human-centric Industry 5.0. *Technological Sustainability*, *3*(3). https://doi.org/10.1108/TECHS-11-2023-0049

CIWIL Current Issues in Work-Integrated Learning
UNIVERSITY WEST
ISSN: 3035-6903 CIWIL 1(2) 2025, p. 39-53 doi.org/10.64775/ciwil.2025.56057

Ghobakhloo, M., Iranmanesh, M., Mubarak, M. F., Mubarik, M., Rejeb, A., & Nilashi, M. (2022). Identifying industry 5.0 contributions to sustainable development: A strategy roadmap for delivering sustainability values. *Sustainable Production and Consumption*, *33*, 716–737. https://doi.org/10.1016/j.spc.2022.08.003

Grosse, E. H., Sgarbossa, F., Berlin, C., & Neumann, W. P. (2023). Human-centric production and logistics system design and management: transitioning from Industry 4.0 to Industry 5.0. *International Journal of Production Research*, *61*(22), 7749-7759. https://doi.org/10.1080/00207543.2023.2246783

Horvat, D., Jäger, A., & Lerch, C. M. (2025). Fostering innovation by complementing human competences and emerging technologies: an industry 5.0 perspective. *International Journal of Production Research*, *63*(3), 1126-1149. https://doi.org/10.1080/00207543.2024.2372009

Hällsten, F. & Tengblad, S. (Eds.) (2006). *Medarbetarskap i praktiken*. Lund: Studentlitteratur.

Karanasios, S. (2018). Toward a unified view of technology and activity: The contribution of activity theory to information systems research. *Information Technology & People*, *31*(1), 134–155. https://doi.org/10.1108/ITP-04-2016-0074

Kilhammar, K. (2018). Developing Co-workership in organisations in (Eds.) Ahl, H., Bergmo-Prvulovic, I. & Kilhammar, K. *Human Resource Management: A Nordic Perspective*, Routledge (p. 40-52). Taylor & Francis Group.

Kilhammar, K. (2011). *Idén om medarbetarskap: en studie av en idés resa in i och genom två organisationer*. Diss. Linköping: Linköpings universitet, 2011. Linköping.

Kilhammar, K., & Ellström, E. (2015). Co-workership in practice: a study of two Swedish organizations. *Human Resource Development International*, *18*(4), 328–345. https://doi.org/10.1080/13678868.2015.1049909

Larsson, G., Zander, A. E., & Lönngren, M. (2022). Co-workership: development of an assessment tool. *International Journal of Organizational Analysis*, *30*(7), 184-195. https://doi.org/10.1108/IJOA-08-2022-3377

Li L. (2024). Reskilling and Upskilling the Future-ready Workforce for Industry 4.0 and Beyond. *Inf Syst Front 26*, 1697–1712. https://doi.org/10.1007/s10796-022-10308-y

Lu, Y., Zheng, H., Chand, S., Xia, W., Liu, Z., Xu, X., Wang, L., Qin, Z., & Bao, J. (2022). Outlook on human-centric manufacturing towards Industry 5.0. *Journal of Manufacturing Systems*, *62*, 612–627. https://doi.org/10.1016/j.jmsy.2022.02.001

Maddikunta, P. K. R., Pham, Q. V., Deepa, N., Dev, K., Gadekallu, T. R., Ruby, R., & Liyanage, M. (2022). Industry 5.0: A survey on enabling technologies and potential applications. *Journal of industrial information integration*, *26*, 100257. https://doi.org/10.1016/j.jii.2021.100257

Meythaler, A., Baumann, A., Krasnova, H., Hinz, O., & Spiekermann, S. (2023). Technology for Humanity. *Business & information systems engineering*, *65*(5), 487-496. https://doi.org/10.1007/s12599-023-00831-w

Müller, J. (2020). *Enabling Technologies for Industry 5.0 - Results of a workshop with Europe's technology leaders*. *Directorate-General for Research and Innovation*. https://doi.org/10.2777/082634

Nahavandi, S. (2019). Industry 5.0-a human-centric solution. *Sustainability*, *11*(16). https://doi.org/10.3390/su11164371

Nielsen, P. A., Stouby Persson, J., Axel, P., & Stouby, J. (2016). Engaged Problem Formulation in IS Research. *Communications of the Association for Information Systems*, *38*(1) 35. https://doi.org/10.17705/1CAIS.03835

Oeij, P. R. A., Lenaerts, K., Dhondt, S., Van Dijk, W., Schartinger, D., Sorko, S. R., & Warhurst, C. (2024). A Conceptual Framework for Workforce Skills for Industry 5.0: Implications for Research, Policy and Practice. *Journal of Innovation Management*, *12*(1), 205–233. https://doi.org/10.24840/2183-0606_012.001_0010

Olsson, A. K., Bernhard, I., Arvemo, T., & Snis, U. L. (2021). A conceptual model for university-society research collaboration facilitating societal impact for local innovation. *University Society Research Collaboration*, *24*(4), 1335–1353. https://doi.org/10.1108/EJIM-04-2020-0159

Olsson, A. K., Eriksson, K., & Carlsson, L. (2025). Management towards Industry 5.0: A co-workership approach on digital transformation for future innovative manufacturing. *European Journal of Innovation Management*, *28*(1), 65–84. https://doi.org/10.1108/EJIM-09-2023-0833

Rejeb, A., Rejeb, K., Zrelli, I., Kayikci, Y., & Hassoun, A. (2024). The research landscape of Industry 5.0: a scientific mapping based on bibliometric and topic modeling techniques. *Flexible Services and Manufacturing Journal*. https://doi.org/10.1007/s10696-024-09584-4

Riel, A., Messnarz, R., & Woeran, B. (2020). Democratizing Innovation in the Digital Era: Empowering Innovation Agents for Driving the Change. In M. Yilmaz, J. Niemann, P. Clarke, & R. Messnarz (Eds.), *Systems, Software and Services Process Improvement* (pp. 757–771). Springer International Publishing. https://doi.org/10.1007/978-3-030-56441-4_57

Rutledge, S. A., Gilliam, E., & Closson-Pitts, B. (2023). 'I'm being heard right now': amplifying individual voice through scaffolded focus groups. *International Journal of Social Research Methodology*, *26*(1), 67–82. https://doi.org/10.1080/13645579.2021.1973272

Smithson, J. (2000). Using and analysing focus groups: Limitations and possibilities. *International Journal of Social Research Methodology*, *3*(2), 103–119. https://doi.org/10.1080/136455700405172

CIWIL Current Issues in Work-Integrated Learning
UNIVERSITY WEST
ISSN: 3035-6903 CIWIL 1(2) 2025, p. 39-53 doi.org/10.64775/ciwil.2025.56057

Sunnemark, L., Sunnemark, F., Dahlquist, K., Gahnström, E., Assmo, P., & Piper, L. (2024). Bridging theory and practice through Work-Integrated Learning (WIL): critical perspectives on the conceptualisations of WIL at a university in Sweden. *Critical Studies in Education*, *65*(4), 403-420. https://doi.org/10.1080/17508487.2023.2294462

Van de Ven, A. H. (2007). *Engaged scholarship: A guide for organizational and social research*. Oxford University Press.

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *Journal of Strategic Information Systems*, *28*(2), 118–144. https://doi.org/10.1016/j.jsis.2019.01.003

Vidgen, R., & Braa, K. (1997, May). Balancing interpretation and intervention in information system research: the action case approach. In *Information Systems and Qualitative Research: Proceedings of the IFIP TC8 WG 8.2 International Conference on Information Systems and Qualitative Research, 31st May–3rd June 1997, Philadelphia, Pennsylvania, USA* (pp. 524-541). Boston, MA: Springer US.

Warner, K. S. R., & Wäger, M. (2019). Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal. *Long Range Planning*, *52*(3), 326–349. https://doi.org/10.1016/j.lrp.2018.12.001

Westerman, G. (2016). Why Digital Transformation Needs a Heart. *MIT Sloan Management Review*, *58*(1), 19–21. http://mitsmr.com/2cmzay6

Wheeler, W., & Thomas, A. M. (2011). Engaging youth in community development. In *Introduction to community development: Theory, practice, and service-learning* (209–227). Thousand Oak.

Xu, X., Lu, Y., Vogel-heuser, B., & Wang, L. (2021). Industry 4 . 0 and Industry 5 . 0 — Inception , conception and perception. *Journal of Manufacturing Systems*, *61*(September), 530–535. https://doi.org/10.1016/j.jmsy.2021.10.006