Leadership beyond hierarchies, toward public value: exploring, explaining and enhancing leadership in public sector networks

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Developing leadership in inter- and intra-organizational networks: using Design Science to develop an intervention aimed at advancing leadership

Author statement

This chapter was single-authored by the author of this dissertation. I developed the leadership intervention, conducted the focus groups and questionnaire, analyzed the data, and wrote the full chapter. My supervisors contributed by critically assessing the focus group topic list, reviewing the questionnaire items, and reflecting on the empirical analysis. They also provided conceptual and methodological feedback throughout the process.

5.1 Introduction

The role of leadership in collaborative contexts has received growing scholarly attention over the past two decades (Crosby & Bryson 2010; Morse 2010; Kramer et al. 2019). In interorganizational networks, leadership is conceptualized as a more concentrated or more distributed process in which actors engage in leadership behaviors to steer each other towards collective and individual goals (Akerboom, Groeneveld and Kuipers 2024). This conceptualization shifts the analytical focus from individual leaders to leadership as a set of relational behaviors embedded in a complex context.

Although the body of scholarly knowledge on leadership in interorganizational settings has expanded (Crosby & Bryson, 2010; Silvia & McGuire, 2010; Ansell & Gash, 2018), much remains unclear about how leadership can be developed or enhanced in such contexts. Leadership development literature predominantly focuses on intra-organizational settings, emphasizing the cultivation of leadership skills within organizational boundaries (Day, 2001; Van Velsor, McCauley & Ruderman, 2010). As a result, leadership development practices often target individuals in formal hierarchical roles—such as managers, team leaders, or designated high potentials—who are expected to exercise formal authority (Drath et al., 2008; McCauley et al., 2014).

This focus stands in contrast to the nature of leadership in interorganizational networks, where leadership is frequently shared or distributed across actors without formal authority (Ospina & Foldy, 2010; Bryson, Crosby & Stone, 2015). The consequences are twofold: first, leadership development efforts are often not fitted to the collaborative demands of network settings; and second, individuals who are well-positioned to contribute to leadership processes in networks may be overlooked or unsupported in their development.

Therefore, there is a need for leadership development approaches that go beyond the traditional model of transferring knowledge and skills through individual training programs. Such approaches often take place outside the collaborative context, and therefore risk overlooking the relational, situated, and processual nature of leadership in networks (Raelin, 2016; Ospina et al., 2020). To be effective in interorganizational networks, leadership development should be embedded in the actual practice and context of collaboration, enabling participants to learn and experiment *in situ* (Hoppe, 2011; Huxham & Vangen, 2013). This means that leadership development should not only target individual

capacities but also foster collective sensemaking, coordination, and influence dynamics as they unfold within and across organizational boundaries.

Given the lack of such context-sensitive development strategies, this study aims to design a leadership intervention specifically tailored to intra- and interorganizational networks. To this end, this study aims to develop and test an artefact that can be used to enhance leadership in networks. To do so, the research draws on principles from design-oriented approaches, which allow for the development and iterative testing of interventions in real-world contexts where conventional methodologies may fall short (Van Aken & Romme, 2009; Barzelay & Thompson, 2010). The artefact will be developed through a Design Science framework (Johannesson and Perjons 2014). Design Science refers to an approach to scientific enquiry that involves the study and development of artefacts which aim to mitigate or solve a practical problem (Dresch et al. 2015). Consequently, this paper aims to answer the following research question: "*How can Design Science be applied to create an intervention that aims to enhance leadership development in networks?"*

This paper proceeds as follows. Firstly, the next section describes the theoretical underpinnings of the intervention. Secondly, the approach of scientific enquiry used in this study, Design Science, is introduced. Consequently, this paper describes the development and evaluation of the artefact. This paper concludes with the results of the empirical, qualitative evaluation of the intervention.

5.2 Theoretical framework

As this study aims to develop an intervention that enhances leadership within the specific context of networks, this theoretical framework will first establish how current leadership theory and practice perceive and engage in leadership development. Secondly, this section describes how current leadership theory and practice fall short on understanding leadership development in the specific context of networks, and explains the intricate characteristics of networks. This section concludes with an overview of the foundations and limitations of leadership development within this context.

Leadership and leadership development: from leader-centric to processual

Leadership development aims to understand, predict, and effectively enhance the leadership capacity of individuals and groups (Day, 2001; Van Velsor, McCauley, & Ruderman, 2010; McCauley, DeRue, & Yost, 2015). This can be done through programmatic interventions

such as assessments, mentoring or formal education (McCall 2010) or experience-focused interventions (Kegan and Lahey 2016).

From the onset of leadership theory in during the 1950s, its focus has primarily been individual *leaders* and the specific traits or competencies they have to influence followers towards their goals (Drath et al. 2008). Consequently, leadership development practices have been geared towards the enhancement of specific competencies in individual leaders (see, for instance, Mumford et al. 2007). These leadership development practices have often been limited to developing 'high potentials' – employees of organizations deemed to have leadership potential (Church et al. 2021).

However, this predominant focus on (potentially) formal *leaders* in leadership development is problematic for two reasons. Firstly, this approach excludes other employees from developing leadership capabilities and exploring their role in the process of leadership (Day et al. 2021). Secondly, this approach does not sufficiently address or enhance factors exceeding individual competencies, such as work climate and psychological safety.

Therefore, recent literature on leadership has shifted its focus towards *processes of leadership* rather than individual *leaders* (Higgs 2022; By 2021; Moore, Elliott & Hesselgreaves 2023). Recent leadership studies emphasize that leadership behaviors do not necessarily need to be exhibited by formal leaders or managers. Rather, a multiplicity of actors may display leadership. Hence, scholars suggest that leadership – as opposed to leaders - should be seen as a shared, distributed or collective process in which many actors participate (Denis, Langley and Sergi 2012; Ospina et al. 2020). According to Denis, Langley and Sergi (2012 p.212) leadership can be regarded as "a collective phenomenon that is distributed or shared among various people, potentially fluid, and constructed through interaction." This conceptual shift allows for a broader understanding of leadership and includes whole teams, networks or organizations.

The need for leadership across organizational boundaries

Although this relational lens on leadership as a process in which collectives can participate has paved the way for leadership development that engage a wider audience, the creation of leadership development interventions in the specific context of networks is still pending. Both leadership theory and leadership development practice predominantly focus on organization-internal leadership development. This is unfortunate, as organizations are increasingly required to collaborate across organizational boundaries (Voets, Keast and

Koliba 2019), both between organizational units and teams (Edmondson and Harvey 2018) and in interorganizational contexts (Gray 1985).

To illustrate the need for interventions tailored to collaborative contexts, it is important to understand the intricacies of collaborative settings. There are two aspects that set networked collaboration apart from organizations. Firstly, scholarly literature characterizes networks as inherently paradoxical (Connelly et al. 2008; Saz-Carranza and Ospina 2010; Koppenjan and Klijn 2004). Compared to individual organizations, networks are confronted with several tensions that need to be managed carefully. For instance, Saz-Carranza and Ospina (2010) emphasize the so-called '*unity-diversity-tension*.' This tension refers to the challenge of promoting coordinated decision-making and collaborative actions among independent entities that have unique aspirations, operational objectives, and organizational traits. A second paradox associated with collaborative systems concerns the lack of formal hierarchy or leadership. Collaborative systems generally do not have a defined leader. Formal instruments of encouraging or sanctioning members are missing (Klijn 2005). As a result, while there may be a convener who is not necessarily a member of the group (Huxham and Beech 2003), collaborative contexts often involve many 'leaders' who appear depending on the specific task at hand (Connelly et al. 2014).

These characteristics suggest that leadership in networked settings cannot be effectively developed through conventional, individual-centered training programs. Instead, leadership development must be adapted to the collaborative context itself. It requires an approach that not only builds individual leadership capacity but also cultivates shared leadership development within the network structure. There is a need for a leadership intervention which focuses on enhancing leadership processes in networks, specifically aimed at enabling individual network participants to recognize their potential for participating in network leadership as a process in which network participants are encouraged to collaborate to achieve common goals.

The foundations and limitations of leadership in networks

To design an effective leadership development intervention for interorganizational networks, it is essential to understand both the conceptual foundations of leadership in these contexts and the organizational constraints that shape its enactment. Leadership in networks is understood as a dynamic and relational process, involving a range of behaviors oriented toward tasks, relationships, change, and the external environment (Akerboom,

Groeneveld and Kuipers 2024). These behaviors are not confined to formal network coordinators but can be performed by a variety of actors.

However, the enactment of these behaviors is not merely a matter of individual competence or motivation. Organizational and institutional conditions significantly shape what is possible. Misalignment between organizations, political ambiguity, cultural stereotypes, and a lack of top-level support can all constrain employees when participating in networks (Van Meerkerk and Edelenbosch 2017). These factors suggest that leadership in networks must be understood as contextually embedded and structurally conditioned—an insight with direct implications for leadership development.

This argument underlines the need for a development approach that is situated in the actual practice of collaboration and sensitive to the relational and structural constraints actors face. Rather than focusing solely on individual skill-building, such an intervention must enable participants to experiment, reflect, and adapt leadership behaviors in real network settings.

Design Science Research offers a suitable methodological foundation for such a development approach. As a problem-solving paradigm, DSR focuses on designing and testing practical interventions—such as tools, models, or frameworks—that are grounded in real-world complexity and refined through iterative evaluation (Dresch et al. 2015). This makes it particularly valuable for addressing the relational and structural challenges of leadership in interorganizational networks. Rather than isolating leadership development from practice, Design Science enables the co-creation of context-sensitive interventions in collaboration with practitioners, ensuring that they are both theoretically informed and practically relevant.

5.3 Research approach: Design Science

This study uses Design Science as its methodological basis, paired with qualitative data collection methods. Johannesson and Perjons (2014) distinguish five phases in the process of artefact creation. Each of the phases requires a research strategy in which empirical data are collected and assessed through scientific methods (Collatto et al. 2017).

The first phase, '*explicate the problem*' aims at analyzing a problem and identifying its root causes. In this stage, the researcher formulates the particular problem the artefact intends

to solve, based on (academic) literature (March and Storey 2008). Once the problem has been defined, the second phase, *'define requirements'* focuses on establishing a set of criteria the artefact needs to meet in order to effectively address the problem at hand (Dresch et al. 2015). This process can be viewed as the transformation of the practical problem into specific elements the artefact must address in its design. These requirements can be, for instance, functional, aesthetical, or efficiency-driven. The third phase, *'design and develop artefact'* involves a process in which the researcher creates a prototype of the artefact, based on the problem at hand and the requirements set in the previous phases. Fourthly, the phase *'demonstrate artefact'* requires the researcher to test the artefact by applying it to a case, or "proof of concept," in order to demonstrate the usability of the artefact in regards to the problem (Hevner et al. 2004). Lastly, the phase *'evaluate artefact'* involves testing the artefact to determine whether the artefact meets the requirements and to what extent the artefact mitigates the problem at hand (Dresch et al. 2015).

Table 5.1 illustrates the data collection methods used in each of the five stages of the Design Science framework. In the next section, these data collection methods are explained in more detail, followed by an explanation of how each step in the process informed the design of the artefact.

Table 5.1 *Overview of data collection methods, based on research phase*

	Define Requirements	**Design and develop artefact**	**Demonstrate artefact**	**Evaluate artefact**	**Explicate the problem**
Aim	Establish criteria for artefact effectiveness	Create a prototype of the artefact through an iterative process of feedback	Apply the artefact to target group.	Determine whether artefact meets the requirements and mitigates the problem	Analyze problem and its root causes
Method	Focus groups (N=44)	Pilot testing (N=25) Qualitative questionnaire (N=73)	Qualitative questionnaire (N=86) Group interview (N=19)		Literature review (Section 5.2)

5.4 Design process

This section explains the design process of a leadership development intervention according to the above five phases of artefact development (Johannesson and Perjons 2014). The data collection method for each phase is described. The data collected in that phase are then analyzed, followed by a description of how each data collection method informed the development of the leadership development intervention.

5.4.1 Phase 1: Explicate the problem

Data collection

To explicate the problem, this study draws on leadership and leadership development literature to highlight a particular gap of knowledge the artefact needs to address. As the literature review in Section 5.2 has shown, a key gap lies in the absence of leadership development interventions specifically designed for and *in* collaborative contexts, where leadership is often shared among multiple actors rather than concentrated in a single individual. The intervention should account for the processual and behavioral nature of leadership, as well as the organizational context factors that may either constrain or enable its enactment.

Interpretation of data

Based on the literature review, the problem this intervention aims to mitigate is that current leadership practices do not sufficiently cover the intricacies of leadership in a collaborative context (Drath et al. 2008; Mumford et al. 2008; Chruch et al. 2021).

Consequences for artefact development

To mitigate this issue, this study develops a leadership intervention that applies to the specific context of collaborative networks. Using the literature as its starting point, this intervention should take into account the informal and processual nature of leadership in networks, in which network participants use leadership behaviors to achieve organizational and collective goals. The intervention should also consider that leadership - though promising – can be constrained by organizational context factors.

5.4.2 Phase 2: Define requirements

Data collection

The second step of the Design Science cycle – *defining requirements* - involved focus groups (N=44). Focus groups are considered an adequate method to retrieve the opinions and perspectives of participants, as focus groups allow participants to respond to each other and allow the researcher to ask follow-up questions (Bryman 2016). The questions posed to respondents were informed by the literature review presented in Section 5.2, as well as the key findings of Chapters 2, 3, and 4 of this dissertation. Respondents were invited to reflect on their needs and expectations concerning leadership development in interorganizational networks. The full topic list used to guide these discussions is provided in Appendix D.1. The focus groups were held with three categories of respondents: one focus group consisted of management development professionals (N=13), three focus groups were held with professionals involved in inter-organizational collaboration (N=18), and one focus group contained professionals involved in organization-internal collaboration (N=13). The focus groups were recorded and transcribed verbatim and took 90 minutes. The researcher used inductive coding to retrieve participants' views on five elements: the main learning goal, form, practical requirements and risks related to the intervention as discussed by the participants.

Interpretation of data

The focus groups retrieved five coding categories, which were translated into requirements for the leadership intervention: learning goals, learning form, practical prerequisites, and risks. An overview of these coding categories is provided in Table 5.2.

Learning goals

Based on their experiences with collaboration in networks, several focus group participants identified key skills and competencies necessary for effective networking. They emphasized the importance of courage, including the ability to make decisions that do not yield immediate personal benefits, as well as the capacity to consider the interests of others. Additionally, transparency about one's own capabilities and limitations, along with curiosity about the perspectives of other network members, were highlighted as essential competencies applied in practice.

Participants also reported frequently sensing an underlying layer of unspoken interests and expectations within their network collaborations. They expressed a strong need for

an intervention that addresses these implicit dynamics. Almost all focus group members indicated a desire for theoretical knowledge about networks, including their functioning and effective practices. Furthermore, they emphasized the importance of individual awareness regarding their own position and the positions of others within the network. They also sought practical action perspectives—concrete strategies for improving collaboration.

Some respondents specifically mentioned the need for a blueprint outlining appropriate leadership behaviors for different situations. In addition to individual awareness, others underscored the significance of collective reflection on the collaboration process. They expressed the need for an intervention that facilitates reflection on a fundamental question: how can network collaboration generate societal value rather than merely serving individual interests?

In sum, based on respondents' comments, the focus groups retrieved two broad themes that participants agreed on as learning goals for the leadership intervention. Firstly, the artefact should help participants recognize and understand leadership in networks. According to the focus group respondents, the intervention must provide foundational theoretical knowledge about networks, including what networks are and how they differ from individual organizations. The focus group respondents also indicated that the intervention should include knowledge about leadership in networks, specifically addressing the various leadership behaviors that exist within these contexts. The focus group respondents also emphasized that the intervention should enhance mutual understanding between network partners. Lastly, the focus group respondents suggested that the intervention should educate participants about the essential components required for a network to function effectively.

The second theme the focus groups agreed on was the importance of gaining insight into one's own leadership behavior. The focus group respondents recommended that the intervention should raise awareness of each participant's role and position within the network, as well as highlight the opportunities they have to demonstrate leadership and strengthen the network. The focus group respondents stated that the intervention should offer concrete courses of action that participants can apply in various situations to strengthen the network. The focus group respondents also suggested that the intervention should enhance the network's learning capacity by encouraging participants to reflect on its functioning.

Learning form

Focus group respondents also emphasized requirements related to the form of the artefact. The focus group respondents stressed that the intervention should be realistic and well aligned with real-world practice. Fictional cases or situations tend to disengage participants from the intervention. Additionally, focus group respondents emphasized the need for an intervention that allows for both individual learning and collective learning among network partners.

Practical prerequisites

Thirdly, the respondents mentioned practical prerequisites to be considered. According to feedback from focus group participants, the intervention should be easily integrated into daily routines, such as a brief exercise at the beginning of meetings. They also stressed the importance of ensuring that the intervention aligns with or does not disrupt existing practices (holistic approach), and that its language and naming should be tailored to suit different target groups. Additionally, due to the geographical spread of partners, there was a consensus on the benefit of offering hybrid options for accessibility and inclusivity.

Risks

Lastly, the focus groups retrieved a particular risk involved in developing and applying an intervention in network practice. Respondents indicated that any intervention will remain unsuccessful if the organizational context is not susceptible to change.

Consequences for artefact development

The results of the focus groups are listed in Table 5.2. This list of requirements is used to develop a prototype of an intervention that enhances leadership in public sector networks.

Table 5.2 *Overview of artefact requirements*

Criterion	Specification	Description
Learning goal: recognize and understand leadership in networks	*Knowledge of networks*	The intervention must deliver basic knowledge of networks: what are networks, how do they differ from individual organizations?
	Knowledge of leadership	The intervention must cover knowledge of leadership in intra- or inter-organizational networks: what leadership behaviors exist within networks?
	Knowledge of partner organizations	The intervention should contribute to a better understanding between network partners.
	Knowledge of collaboration requirements	The intervention should inform the participant about the components a network needs to function properly.
Learning goal: Insight into own (leadership) behavior	*Participant self-awareness*	The intervention should increase awareness of the role/position of the participant in the network and the opportunities they have to strengthen the network (demonstrate leadership).
	Action-orientation	The intervention should provide guidelines that participants can use in various situations to strengthen the network through leadership.
	Reflection	The intervention should contribute to the learning capacity of the network by having participants reflect on the functioning of the network.
Learning form	*Realism*	The case must be well aligned with practice or "immersive." Hence, unrealistic cases or situations should be avoided.
	Generic application	The intervention should be applicable to different networks.
	Individual component	The intervention must allow for individual learning.
	Joint component	The intervention must be designed so that network partners can learn together.
Practical prerequisites	*Embeddedness in everyday practice*	The intervention must be applicable in everyday practice.
	Alignment with existing interventions	The intervention must align with, or at least not conflict with, existing interventions.
	Language use	The language used in the intervention must be adapted to the target group.
	Hybrid possibilities	It is desirable to offer hybrid/online possibilities, as network partners may be located remotely.
Risks	*Willingness*	The intervention should take into account that its efficacy depends on the willingness of participating members to implement intervention outcomes.

5.4.3 Phase 3: Design and develop artefact

Data collection

Thirdly, the *design and development phase* involved the creation of an artefact (a leadership intervention) on the basis of the outcomes of the focus groups and literature review. This step involved an iterative process of artefact development and feedback. Feedback was gathered through pilot testing and demonstrations (N=73). Demonstrations involved a presentation of the artefact to either individuals or small groups, in which participants were asked to provide feedback on each element of the artefact. After these demonstrations, participant comments were coded as requirements. The pilot tests involved four cases of networks to which the artefact was applied. An overview of cases can be found in Table 5.3.

The process involved a combination of purposive sampling and snowball sampling. Purposive sampling was used to establish criteria for the 'fitness' of the test cases. These criteria included: (a) test cases had to contain a minimum of three participants; (b) participants should represent autonomous organizations (inter-organizational networks) or autonomous sub-units (intra-organizational networks); (c) the networks should already be established, to ensure that participants can reflect on the questions included in the intervention. After the test, participants were encouraged to advertise the intervention to peers in their professional network. Hence, snowball sampling was used to retrieve more test cases. These additional test cases were also required to adhere to the requirements set through purposive sampling.

Test case respondents (N=73) were asked to provide feedback on the basis of a qualitative questionnaire. This qualitative questionnaire consisted of four open-ended questions aimed at measuring how the intervention performed on the basis of the requirements of the artefact: (1) What do you think of the *content* of the intervention? How does the intervention contribute to its learning goals? (2) What do you think of the *practical usability* of the intervention? For instance, do you think you can use this intervention in your network? (3) What do you think about the *visual design* of the intervention? Think about, for instance, language used, aesthetics. (4) Do you have any *other feedback* on this intervention? Similar to the demonstrations, the tests provided input for the refinement of the requirements and improvements to the intervention.

Table 5.3 *Overview of feedback and test cases participating in the development phase*

Testcase	Type of feedback	Target group	Focus	Respondents
1	Demo	Academic peers	Generic	10
2	Demo	Network participant	Generic	1
3	Demo	Network spokesperson	Generic	1
4	Demo	Network participants	Intra-organizational	2
5	Demo	Network participants	Generic	6
6	Demo	Network participants	Inter-organizational	4
7	Demo	Serious game developer	Generic	1
8	Testcase	Innovation network	Inter-organizational	22
9	Testcase	Healthcare network	Inter-organizational	9
10	Testcase	Innovation network	Inter-organizational	27
11	Testcase	Innovation network	Intra-organizational	15

Consequences for artefact design

Based on the requirements retrieved from the focus groups, a prototype of the intervention was developed. This section describes the first draft of the intervention and its learning objectives, learning form and practical prerequisites. As the process of developing the artefact involved an iterative process of development and feedback, the section describes how the artefact was refined through demonstrations and testcases.

Learning objectives

Based on the requirements, the intervention aims to help participants understand the essential components of effective collaboration, and what their network needs to become more effective, help participants understand and recognize leadership in their network, and help participants recognize their own opportunities for exhibiting leadership.

Learning form

The prototype involves a gamification of techniques used to generate and structure a dialogue between network participants about the collaboration process and the role of leadership in this process. This format was selected on the basis of four requirements. The intervention is *generic* in its application, as it contains questions related to collaboration and leadership, which are applicable to various types of collaborations. Secondly, the prototype consists of both collective and individual learning components. In certain exercises, participants are challenged to converse with each other, whereas other exercises require each participant to reflect on their own conduct. Thirdly, the format is realistic/immersive as it does not contain a fictional scenario.

Practical prerequisites

In the development process, a gamification of techniques was also chosen as it fits the practical prerequisites mentioned by the focus group respondents. Firstly, this intervention *can be embedded in everyday practice*. The intervention contains a series of smaller exercises meant to generate a dialogue between participants on collaboration and leadership. Each exercise can be conducted separately in 20 minutes. The full intervention takes approximately 3 hours. Attention was also paid to *language* used in the intervention: the researcher aimed at creating an intervention that is suitable for various subcategories of employees who operate in networks, ranging from operational to strategic levels of organizations. Thirdly, the prototype can theoretically be used online through videocall software, although the form of the intervention lends itself best to physical meetings.

Practitioner feedback: demonstrations and test cases

The artefact was first presented to individual members of intra- or interorganizational networks. During these presentations, the researcher demonstrated the artefact components. The demonstrations provided opportunities for feedback. Consequently, this feedback was used to establish additional requirements, and to improve the intervention before effectively evaluating its use. The additional requirements are summarized in Table 5.4.

The intervention requirements, as identified by respondents, emphasize several key elements. First, the intervention must maintain internal consistency, ensuring that all materials are coherent and free from contradictions. It should provide a socially safe environment where participants feel comfortable discussing sensitive topics related to collaboration and leadership. Clarity is also essential; the intervention should be comprehensible, enabling participants to apply it independently with the help of clear instructions.

Respondents highlighted the importance of accessibility, stressing that the intervention should be inclusive and suitable for diverse target groups, considering factors such as color blindness and varying language proficiency levels. Additionally, the content should align closely with participants' learning objectives, ensuring that it remains relevant and impactful. Respondents also emphasized that the insights gained from the intervention should be readily applicable within the chain or network, enhancing implementation feasibility.

To encourage participation, the intervention's design and appearance should appeal to participants. It must also be complete, providing all the necessary information for

participants to navigate it successfully. A logical structure, with a clear flow between the steps, was identified as crucial for a seamless and coherent process. While the intervention should not be overly time-consuming, respondents stressed the need for sufficient space for discussion to enable deeper insights.

Flexibility emerged as another key requirement, with respondents noting that the intervention should be adaptable to the specific context of the network, including the time available for its execution. Lastly, the intervention must meet the expectations set during its promotion, ensuring that participants feel their needs and expectations are fulfilled.

Table 5.4 *Additional requirements retrieved from the design and development phase*

Requirement	Description
Consistency	The intervention must be internally consistent/coherent. Materials should not contradict each other.
Social Safety	The intervention must provide a safe environment to discuss difficult topics related to collaboration and leadership.
Clarity	The intervention must be comprehensible. With the help of instructions, players should be able to apply it autonomously.
Accessibility	The intervention should be inclusive and accessible to various target groups (consider: color blindness, language levels).
Content	The content of the intervention should align with the participants' learning objectives.
Implementation feasibility	The insights from the intervention should be implemented within the chain/network.
Appeal	The intervention should, in its appearance, encourage participants to take part.
Completeness	The intervention must be complete. All information that participants need to go through the intervention should be present.
Intervention Mechanics	The intervention must be logically structured; there should be a logical flow between the different intervention steps.
Practical Feasibility	The intervention should not take too much time but should be executable in between activities. At the same time, there should be sufficient space for discussion to allow for more thorough findings.
Flexibility	The intervention must be adaptable to the context of the network (consider: the time the network has to carry out the intervention).
Expectation Management	The intervention must meet the expectations that the participant has based on the promotion of the intervention.

5.4.4 Phase 4: Demonstrate artefact

This section describes the material components of the intervention and explains how these material components respond to the problem and match the requirements. The intervention consists of a series of exercises, which are summarized in Table 5.6. For each component of the intervention, a picture of examples of intervention materials is included in Appendix D.2.

The exercises are intended to generate and facilitate dialogue among network members about collaboration and leadership in their respective networks. For each of these exercises, educational materials were developed on the basis of the literature review on leadership and collaboration. Specifically, the intervention contains the main insights from the literature review and Chapter 2, 3 and 4. The intervention consists of sets of cards, which are discussed at subsequent stages in the intervention. These sets include cards regarding the collaborative phase of the network, cards that specify essential components of collaborative processes, cards that describe contextual factors limiting or encouraging collaboration, and cards specifying leadership behavior. In Table 5.5, each of the sets of cards is explained, after which a description of their application in the intervention is given.

Table 5.5 *Components of the artefact*

Intervention component	Description	Intervention materials	Reference
1. Network Phase Identification	At the start of the intervention, participants are encouraged to select the network phase they identify most with, in order to help them find the most appropriate leadership behaviors as the intervention progresses.	Network phase cards	Morse & Stephens (2012)
2. Baseline Measurement	Cards mentioning essential elements of collaboration are used to raise participants' awareness of aspects of their own collaboration that are functioning well or poorly. Respondents are asked to categorize the cards: is the component mentioned on the card going well, or does it require improvement? The cards correspond with three essential elements of collaboration: operational capacity, member relations and a common goal orientation.	Module cards	Chapter 4
3. Context Mapping	Context factors are displayed on cards with a green (positive) and a red (negative) side. Participants are encouraged to discuss the cards and explain how the cards apply to their own organizational context: positively or negatively. The cards correspond with organizational factors hindering or encouraging leadership in networks.	Context factor cards	Chapter 3
4. Leadership Scan	Cards with leadership behaviors and practical examples of these behaviors are distributed among participants. Participants are asked to identify leadership behaviors which they believe are required, given the specific aspect of collaboration that needs improvement. The cards correspond with Yukl's taxonomy of leadership (2012), adjusted to network contexts.	Leadership cards	Chapter 2
5. Reflection	Respondents reflect on who could display leadership behaviors in their network, and in which direction (to each other, towards their own organization, or externally). They do so on an individual basis (reflection sheet) and as a group.	Leadership cards and Reflection sheet	Chapters 1, 2 and 3

Table 5.6 summarizes how each of the artefact components is developed to match the artefact criteria as established through the literature review and focus groups.

Table 5.6 *Overview of alignment between artefact components and requirements*

Criterion	Specification	Description	Intervention component
Learning goal: recognize and understand leadership in networks	*Knowledge of networks*	The intervention must deliver basic knowledge of networks: what are networks, how do they differ from individual organizations?	User manual and instruction sheets for participants
	Knowledge of leadership	The intervention must cover knowledge of leadership in intra- or inter-organizational networks: what leadership behaviors exist within networks?	Step 3: Leadership Scan
	Knowledge of partner organizations	The intervention should contribute to a better understanding between network partners.	Step 2: Context-Mapping
	Knowledge of collaboration requirements	The intervention should inform the participant about the components a network needs to function properly.	Step 1: Baseline measurement
Learning goal: Insight into own (leadership) behavior	*Participant self-awareness*	The intervention should increase awareness of the role/position of the participant in the network and the opportunities they have to strengthen the network (demonstrate leadership).	Step 3: Leadership Scan Step 4: Reflection
	Action-orientation	The intervention should provide guidelines that participants can use in various situations to strengthen the network through leadership.	Step 3: Leadership Scan Step 4: Reflection
	Reflection	The intervention should contribute to the learning capacity of the network by having participants reflect on the functioning of the network.	Step 1: Baseline measurement Step 4: Reflection

Table 5.6 *Overview of alignment between artefact components and requirements (continued)*

Criterion	Specification	Description	Intervention component
Learning form	*Realism*	The case must be well aligned with practice or "immersive." Hence, unrealistic cases or situations should be avoided.	Participants only reflect on their own network; not a fictional case.
	Generic application	The intervention should be applicable to different networks.	The intervention provides participants the ability to apply the steps to their own network.
	Individual component	The intervention must allow for individual learning.	Step 4: (Individual) Reflection.
	Joint component	The intervention must be designed so that network partners can learn together.	All steps of the intervention are focused on group-based learning.
Practical prerequisites	*Embeddedness in everyday practice*	The intervention must be applicable in everyday practice.	The intervention consists of various steps. To achieve all learning goals, all steps have to be met. However, participants can pick a step they want to apply to make the intervention more feasible in everyday practice.
	Alignment with existing interventions	The intervention must align with, or at least not conflict with, existing interventions.	The intervention does not interfere with other interventions.
	Language use	The language used in the intervention must be adapted to the target group.	The intervention is aimed at civil servants who operate in networks on a frequent basis. The language is tailored to this target group.
	Hybrid possibilities	It is desirable to offer hybrid/online possibilities, as network partners may be located remotely.	The intervention can be played in a hybrid mode with some modifications.

Table 5.6 *Overview of alignment between artefact components and requirements (continued)*

Criterion	Specification	Description	Intervention component
Risks	*Willingness*	The intervention should take into account that its efficacy depends on the willingness of participating members to implement intervention outcomes.	The intervention actively encourages participants to discuss the outcomes of the intervention within their own organization or organizational sub-unit.

5.4.5 Phase 5: Evaluate artefact

Data collection

Consequently, during the *evaluation phase*, the final version of the intervention was applied to seven networks/respondents to verify its performance. An overview of these cases can be found in Table 5.7. Of the seven cases, four received a shorter version (<2 hours) of the intervention, and three cases received the complete version (>2 hours). From the cases with a shorter version, two cases focused on organization-internal collaboration, and two cases focused on external collaboration. Out of the cases which received the complete version one focused on organization-internal collaboration, the other two were inter-organizational.

The evaluation of the intervention was carried out through a qualitative questionnaire (N=86) in combination with a group interview (N=19). The aim of the qualitative questionnaire was to provide insights into the experiences of participants of the intervention at an individual level, immediately after the intervention. In alignment with the recommendation to use short, easily comprehensible questions in questionnaires (Bryman, 2016, p. 234), the questionnaire consisted of five open questions that encouraged the respondent to reflect on their own learning process. These questions are attached in Appendix D.3.

The group interview took place two months after the intervention and aimed to explore the experiences of the intervention at a collective (network) level. Group interviews provide an appropriate form of data collection that allows participants to respond to each others' comments and engage in discussions, enriching the data. The network participants were asked to reply to questions about the insights that the intervention provided, and to

verify whether and how participants used those insights. The topic lists of the qualitative evaluation can be found in Appendix D.4. The group interviews were only held with participants of the cases which received the complete version of the intervention. The evaluations were transcribed ad verbum.

Data collection for the evaluation of the intervention continued until thematic saturation was reached. Saturation was perceived here as a matter of identifying redundancy in the data; the degree to which new data repeat what was expressed in previous data (Saunders et al. 2018). The authors repeated the evaluation with new cases until no new evidence was found that rejects or conflicts with the results found in the previous cases.

Table 5.7 *Overview of cases participating in the evaluation of the intervention*

Case no.	Policy domain	Type of collaboration	Version	Qualitative questionnaire participants	Interview participants
1	Welfare	Organization-internal	Short	9	0*
2	Welfare and healthcare	Inter-organizational	Short	24	0*
3	Security	Organization-internal	Full	6	5
4	Debt collection	Inter-organizational	Full	10	9
5	Welfare	Inter-organizational	Short	14	0*
6	Municipal (interdisciplinary)	Organization-internal	Short	12	0*
7	Security	Inter-organizational	Full	10	5

*No interviews were held with participants of the short version of the intervention.

Interpretation of data: Immediate, individual-level experiences

Participants' immediate experiences with the intervention were explored through both quantitative and qualitative components. The qualitative questionnaire responses provide an overview of how participants perceived the intervention's impact, while the qualitative reflections offer deeper insights into their learning process and engagement. The quantitative components, such as the means (on a 1-5 scale) and standard deviations per question, are provided in Table 5.8.

Overall, participants expressed a positive view of the intervention, highlighting its value in helping them better understand collaboration dynamics and leadership within their

networks. Participants described gaining a clearer perspective on what was working well in their collaborations and where improvements were needed. For instance, respondent 35 mentions: *"We're doing well on a personal level, but a real eye-opener was that we still have some progress to make together in this area."* Another respondent argues: *"I've noticed that everyone supports the established goals, but each organization has its own primary objective or reason for participating (in a network, sic.). These can vary greatly."*

In particular, the intervention was frequently mentioned as a tool for increasing self-awareness regarding leadership needs within their networks, and which types of behaviors participants themselves could make more use of. For instance, Respondent 44 mentions specific leadership behaviors their network could use more of: *"Task- and change-oriented (leadership, sic). The relationship is already strong. That came through clearly."* Another respondent (84) adds: *"A combination of change-oriented and task-oriented leadership to develop a vision and move towards it in a structured way."* Respondent (83) mentioned that the typology used in the intervention is a helpful tool in deciding which leadership the network needs: *"Especially identifying the four types of leadership provides insight into determining which form is important and valuable at this stage."*

Participants did, however, mention that they find it difficult to use the leadership behaviors in practice. Respondent 12 mentions: *"I know my preferred style, but incorporating the other aspects is sometimes challenging for me—especially the 'how."* A recurring theme in participants' reflections was the depth of insight gained over time. Those who participated in the longer version of the intervention tended to articulate a stronger sense of clarity and confidence in addressing network challenges. They described how the extended engagement allowed for more meaningful discussions, a deeper exploration of leadership roles, and stronger connections among participants. In contrast, those in shorter interventions noted that while the experience was valuable, time constraints sometimes limited opportunities for deeper dialogue and reflection. For instance, Respondent 57 mentions: *"At times, it was challenging to dive deeper for a better understanding, but this was already a great start."*

The context of collaboration also shaped participants' experiences. Those participating in internal networks—where members were already familiar with each other—described a greater ease in discussing challenges and implementing insights from the intervention. In contrast, participants in interorganizational networks sometimes found it more difficult to openly address sensitive topics, especially in shorter interventions. This suggests that while the intervention provided valuable learning opportunities across all contexts, the

depth of engagement and willingness to discuss difficult topics were influenced by both the duration of the intervention and the existing relationships within the network.

In summary, the intervention was generally experienced as a learning opportunity, particularly in fostering leadership awareness and helping participants identify strengths and weaknesses in their collaborations. However, the findings also underscore the importance of time and relational context in shaping the depth of participant engagement in the intervention.

Table 5.8 *Mean Scores (1-5) and Standard Deviations by Intervention Duration and Collaboration Type*

	By duration				By collaboration type			
	Short		Long		External		Internal	
Questionnaire item	*Mean*	*Std. Deviation*	*Mean*	*Std. Deviation*	*Mean*	*Std. Deviation*	*Mean*	*Std. Deviation*
"This intervention has helped me identify what is going well in the collaboration and which areas require improvement."	3,78	0,622	4,08	0,572	3,79	0,7	4,04	0,344
"This intervention has helped me gain an understanding of the factors that positively or negatively influence the collaboration."	3,85	0,582	3,85	0,464	3,78	0,589	4	0,4
"The intervention has helped me gain an understanding of the leadership I can (further) demonstrate to elevate the network."	3,81	0,706	3,72	0,737	3,76	0,733	3,85	0,675
"The intervention has helped me address topics in the collaboration process that are typically not discussed within the network."	3,38	0,895	3,88	0,909	3,39	0,965	3,88	0,726
"The intervention has taught me to better understand the type of leadership my network currently needs."	3,84	0,781	4	0,566	3,84	0,751	4	0,645

Interpretation of data: longer-term, network-level experiences

The intervention aimed to enhance participants' competencies across two main learning goals: (1) recognizing and understanding leadership in networks, and (2) gaining insight into their own leadership behavior. Based on group interviews, the following analysis highlights their perspectives on the extent to which these objectives were met from a longer-term, network-level point-of-view.

Regarding the first learning goal, respondents frequently mentioned gaining a foundational understanding of networks and the ability to distinguish them from individual organizations. For example, one respondent shared that the intervention highlighted a recurring tension between collaborative goals and organizational goals, alongside the pressure to prioritize their own organization's needs. This feedback suggests that the intervention addressed this objective at a theoretical level.

Secondly, respondents noted that the intervention included discussions on leadership behaviors within both intra- and interorganizational networks. However, several participants expressed challenges in purposefully applying these behaviors. One respondent commented: *"The intervention made me aware that, regardless of the situation, you always need a combination of all four types of leadership behaviors."* When asked whether she applied these behaviors in practice, the respondent stated: *"Well… not purposively, maybe subconsciously?"* Another participant suggested that providing a template at the end of the intervention, summarizing the leadership behaviors they identified as critical for their networks, could serve as a useful reminder to practice these behaviors regularly.

Thirdly, respondents generally reported an enhanced understanding of their network partners and reflected positively on the collaborative exercises. These exercises were seen as beneficial for fostering communication and trust. However, one respondent cautioned against assuming a direct causal link between the intervention and improved partner understanding. They noted that networks already motivated to strengthen relationships are more likely to engage in such interventions. Thus, the intervention may support better partner relations, but only as part of broader, pre-existing efforts to improve these dynamics.

Lastly, respondents acknowledged that the intervention outlined the key components needed for networks to function effectively. For instance, in one network, all participants agreed that member relations were their greatest strength, while they lacked sufficient

operational capacity to organize their efforts effectively. However, participants emphasized the need for deeper exploration of practical strategies to achieve these goals.

In regards to the second learning goal, insight into participants' own leadership behavior, Respondents indicated that the intervention increased their self-awareness regarding their roles within the network. Through reflective exercises, they identified specific areas where they could exercise leadership to strengthen network ties. However, participants emphasized that a single intervention is insufficient to foster lasting behavioral change. They suggested that combining the intervention with a more extensive coaching trajectory would provide opportunities to practice leadership behaviors in real-world contexts.

Secondly, respondents appreciated the practical tools and strategies provided by the intervention, which they felt boosted their confidence in applying these approaches in various situations. However, participants recommended follow-up sessions to consolidate these skills. One respondent (focus group 3) proposed including a template that summarizes individual outcomes and provides tips on practicing leadership behaviors, as well as a document summarizing group outcomes, to encourage sustained application of these skills.

Thirdly, respondents agreed that the intervention's main contribution was fostering a reflective learning environment. They emphasized that this reflective approach helped them critically evaluate their own leadership capacities. Respondents also recall that the session helped them understand their own (subconscious) tendencies to expect certain leadership behaviors from other network members, such as the largest organization and the network coordinator.

Table 5.9 *Summary of intervention experiences as reported by respondents*

Learning goal	Individual experiences (qualitative questionnaire)	Group-level experiences (group interviews)
Learning Goal 1: Recognize and Understand Leadership in Networks		
Knowledge of Networks	The intervention successfully familiarized participants with the fundamental principles of networks, distinguishing them from standalone organizations. Nonetheless, certain participants indicated a desire for more resources or extended time.	Respondents indicate a foundational comprehension of networks and an ability to differentiate them from individual organizations.
Knowledge of Leadership	Participants highlighted an improved understanding of various leadership behaviors. However, they also emphasized the need for insights into the most effective strategies in specific network environments.	Participants demonstrate an awareness of leadership; however, the intervention falls short in adequately illustrating leadership in practice.
Knowledge of Partner Organizations	Participants noted heightened recognition of one another's strengths and requirements, potentially fostering more unified and productive collaboration.	Respondents report a deeper understanding of their network partners. Activities were regarded as instrumental in enhancing communication and building trust. Nonetheless, the potential impact of selection bias may influence the findings.
Knowledge of Collaboration Requirements	Participants were able to pinpoint and deliberate on these collaborative prerequisites, though some remarked that more organized instruction on these aspects would be beneficial. The dialogues enabled participants to identify deficiencies in their network's operations and pinpoint areas for improvement to strengthen collaboration.	Respondents recognized that the intervention effectively highlighted the critical components required for networks to operate efficiently. However, they stressed the importance of further exploration into practical approaches to achieve these objectives.

Table 5.9 *Summary of intervention experiences as reported by respondents (continued)*

Learning goal	Individual experiences (qualitative questionnaire)	Group-level experiences (group interviews)
Learning Goal 2: Insight into Own (Leadership) Behavior		
Participant Self-Awareness	The intervention effectively facilitated self-awareness by prompting participants to reflect on their roles and contributions within the network. Participants reported gaining a more defined understanding of their position and influence in the network, as well as an appreciation of how their leadership behavior could affect network dynamics.	The intervention enhanced participants' self-awareness concerning their role within the network. Reflective exercises enabled them to pinpoint specific areas where they could demonstrate leadership to reinforce network connections.
Action-orientation	The intervention offered participants tangible strategies, such as methods for enhancing collaboration, establishing common objectives, and resolving conflicts. Nevertheless, participants expressed a desire for additional case studies or scenarios to further practice these behaviors.	Participants valued the practical tools and strategies introduced during the intervention, which they believed enhanced their confidence in implementing these approaches across different contexts. However, they suggested follow-up sessions to further solidify these skills.
Reflection	The structured reflection sessions encouraged participants to critically assess the network's strengths and weaknesses and identify opportunities for improvement. Participants suggested that follow-up sessions could support the continuity of this reflective practice.	Participants concurred that the intervention's primary achievement was creating a reflective learning environment, allowing them to gain greater insight into their leadership potential and their expectations in relation to others.

5.5 Conclusion and discussion

The purpose of the current study was to develop an intervention that enhances leadership in networks, using a Design Science framework. Specifically, this study aimed to answer the following question: "*How can Design Science be applied to create an intervention that aims to enhance leadership (development) in networks?"* For this purpose, this study set out to identify the problem, develop requirements for the intervention, design and develop the intervention, demonstrate the artefact, and evaluate its performance.

The literature review has shown that current leadership and leadership development theory and practice focuses mainly on developing leaders and/or leadership in single organizations (Drath et al. 2008; Mumford et al. 2008; Church et al. 2021). This is problematic in the context of contemporary public sector challenges, which increasingly require collaboration across organizational boundaries (. In such settings, leadership is often shared, fluid, and context-dependent—emerging from behavior and interaction rather than formal authority. Consequently, conventional leadership development approaches are not suited for networked environments, as they do not account for the relational, behavioral, and contextual complexities of leadership in collaborative settings. Hence, this study set out to determine how leadership can be developed within collaborative contexts, such as organization-internal or inter-organizational networks.

Through focus groups, this study established requirements for the intervention. These requirements related to the learning goals, learning form, practical prerequisites and risks involved in the intervention. In the development phase of the artefact, demonstrations and test cases revealed additional requirements to further improve the artefact. Based on these steps, an intervention was created that aims to enhance leadership by means of a gamification of exercises in which network members discuss their mutual collaboration and leadership.

The artefact evaluation covered both the immediate, individual experiences through a qualitative questionnaire and the longer-term, group-level experiences through group interviews. According to the results of the qualitative questionnaire, the intervention has largely met the learning goals by enhancing participants' knowledge of network leadership and increasing their self-awareness within the network. While participants gained foundational knowledge of networks and leadership behaviors, participants of the short version of the intervention mentioned that a more detailed exploration of network-specific dynamics and leadership approaches could further strengthen the outcomes of the game. Additionally, the provision of action-oriented guidance and reflection practices were highly valued, though incorporating follow-up activities could sustain and deepen these insights. Overall, according to the participants, the intervention effectively raised their awareness of leadership in networked environments, though the survey and group interview outcomes suggest some refinements could enhance its effectiveness.

Based on the group interviews, participant feedback suggests that the intervention partially met its learning objectives. Respondents reported improvements in both theoretical

understanding and practical insights regarding leadership within networks. Although participants valued the structured format and interactive activities, their feedback highlights the need for greater emphasis on practical applications and the inclusion of follow-up sessions to amplify the intervention's effectiveness. While the intervention, as a single initiative, successfully raises awareness of leadership in networks, it falls short of achieving sustained behavioral change. The intervention did help participants reflect on their networks and which leadership their network needs, though some improvements could be made to maximize its long-term impact and actually following through on exhibiting leadership.

These findings suggest that while the intervention contributed to awareness and reflection, additional support may be needed to help participants translate insights into action. Future iterations of the intervention could perhaps benefit from further exploration of how leadership functions in practice within networks and how participants can actively apply these insights in their own contexts.

The intervention reveals important theoretical insights about leadership development in networks. It demonstrates that leadership capacity can be cultivated through facilitated interaction that covers shared challenges, frames leadership as a collective process, and provides structured space for behavioral reflection. The success of the intervention supports a relational and behavioral understanding of leadership, suggesting that development occurs when embedded in the actual collaborative context, rather than in isolation from it. The study also highlights the importance of context in developing leadership. In so doing, it responds to calls by other researchers to take context seriously (Van der Hoek, Groeneveld and Beerkens 2021) and to perceive leadership as a relational process in which multiple actors can exhibit leadership behaviors fit to contextual circumstances (Denison et al. 1995). Specifically, as earlier studies on leadership in networks highlight, leadership development in the context of networks deserves more attention (Crosby and Bryson 2017).

For practitioners, the output of this study - a leadership intervention – helps those who operate in inter- and intra-organizational networks recognize and develop their own leadership in collaborative contexts. As leadership development tends to focus on the development of specific skills in individuals, focusing mainly on skills required in an organizational setting, this intervention shifts participants' view on leadership as a process in which multiple individuals – with or without a leadership position – can participate in

order to attain individual and collective goals. This cognitive awareness provides a first step towards behavioral change.

Research limitations

While this study offers valuable insights into a leadership intervention designed to facilitate leadership in networks, several limitations must be acknowledged. First, selection bias poses a challenge, as participants who volunteered for the intervention may already have a predisposition to developing their leadership skills or enhancing their network, potentially skewing the findings. Second, the dynamic and fluid nature of networks complicates the implementation and sustainability of the intervention. Network membership often changes over time, with individuals joining and leaving. Consequently, newcomers who did not participate in the intervention may dilute its long-term impact. Third, the intervention is particularly suited to established networks where members already have prior interactions, enabling them to reflect on strengths and areas for improvement. However, many networks are not pre-established but emerge spontaneously to address specific challenges. These ad hoc networks often consist of members who are unfamiliar with one another, limiting the intervention's applicability. Fourth, the study was conducted within a specific national context – The Netherlands - characterized by cultural norms of openness and directness, as highlighted by Hofstede (2001). These cultural attributes may not be generalizable to other countries where such norms are less prevalent. As a consequence, an intervention that requires participants to openly express their opinions about the collaborative process may not work in other cultural contexts. Finally, the study primarily relied on participants' self-reported experiences of the intervention using qualitative methods. However, the research did not establish a quantitative relationship between the intervention and its outcomes, which limits the ability to draw causal inferences.

While this study demonstrates that leadership awareness and reflection can be fostered through targeted intervention, the broader question of how to support sustained leadership development in networks remains. Leadership development in collaborative settings differs from traditional organizational leadership programs, which often focus on individual skill acquisition in hierarchical contexts (Day, 2000; Van Velsor, McCauley & Ruderman, 2010). In contrast, networks require development approaches that emphasize collective reflection, experiential learning, and relationship-building (Raelin, 2016; Crosby & Bryson, 2017). The intervention presented in this study addresses these needs by embedding learning in actual collaborative dynamics. Yet, the limited duration of the intervention highlights the need for ongoing developmental support, such as follow-up sessions, peer reflection groups,

or coaching formats that reinforce and extend insights over time. Future interventions could build on concepts such as *leadership-as-practice* (Carroll, Levy & Richmond, 2008) or collaborative leadership learning (Ospina & Foldy, 2010) to design more continuous, embedded, and adaptive learning trajectories that mirror the evolving nature of network collaboration.

Directions for future research

Building on the findings of this study, future research could explore several directions to deepen understanding and enhance the practical application of the leadership intervention. First, quantitative studies are needed to rigorously establish the long-term effectiveness of the intervention. Such studies could measure its impact on network outcomes, providing stronger evidence of its efficacy. Second, the intervention itself could serve as a valuable research tool to investigate network dynamics and leadership practices. For instance, future research could examine how participants perceive challenges during different stages of collaboration, identifying specific issues linked to context variables. This might involve exploring whether certain contextual factors (e.g., resource availability, organizational structures) correlate with challenges in operational capacity, member relations, or goal orientation. Additionally, studies could assess whether participants consistently associate specific leadership behaviors with improvements in these areas of the collaborative process. By combining these approaches, future research could not only validate the intervention's impact but also generate actionable insights into the interplay between network context, leadership behaviors, and collaboration outcomes.