Team Role Dynamics in Collaborative Research Teams: A Key to Participatory School Development

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Abstract

In recent decades, schools have faced increasing pressure to meet external expectations for quality and outcomes, requiring school teams, especially when dealing with a (super)diverse student populations, to provide efficient and context-specific responses. Collaborative research emerges as an attractive approach, wherein teams systematically reflect on their educational practices and (should) take data- and evidence-informed action to enhance students' learning. Involving additional stakeholders, such as students and in-service teachers, is considered beneficial, also in preparing pre-service teachers for inclusive education albeit under certain conditions. The current study, therefore, seeks to investigate the complex dynamics and expectations among diverse actors within collaborative research teams engaged in school development processes. This single case study unfolded at the Brussels CityScope Lyceum, where a collaborative research intervention was launched during the 2022-2023 school year to strengthen the student-teacher relationships through the implementation of bi-monthly student talks. This school development process involved a diverse team, including teachers, students, pre-service teachers, a school leader and a teacher educator. Individual concept map-mediated interviews, based on Mumford et al.'s (2008) theoretical framework on team roles for school development, were conducted with 13 members of the collaborative research team. These interviews explored participants' perceptions of role allocation and conceptualization within the team, as well as their views on how these roles contributed to breakthroughs in the school development process. The resulting dataset was subjected to a combined deductive and inductive analysis strategy. The results unveil a landscape of both overlapping and diverging perspectives regarding role allocation and conceptualization among the actors of the collaborative research team. Moreover, the analysis delineates four distinct categories of breakthroughs that propelled the school development process forward in this particular case, with the following roles proving crucial: (1) cooperators and communicators foster connected communication and interaction, (2) contributors and critics enhance the enriching diversity of perspectives, (3) the consul role contributes to supportive leadership, and (4) creators and contractors guide processes of co-creation. The findings suggest that although all team roles are fulfilled, actors' expectations towards each other are only partially met, indicating potential for growth in creating truly participatory, reciprocal spaces for collaborative research. Despite these divergences, roles critical to the transformative potential of the school development process are assumed by multiple actors, possibly contributing to the success of the collaborative research in this case.

Points of Interest

- Collaborative research serves as an approach for school development at CityScope Lyceum in Brussels, focusing on improving student-teacher relationships by setting up periodic student talks.
- Apart from teachers, pre-service teachers and a teacher educator, students are active participants in this collaborative research.

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- Within the collaborative research team, various actors assume distinct roles that complement each other, including those roles that prove crucial to the transformative potential of the school development process.
- Yet, there is notable divergence among the actors in their allocation and conceptualization of team roles, suggesting the need to improve alignment in this regard, as well as transparent and intentional role assignment in settings of collaborative research for school development.

Key words: participatory school development; collaborative research; team roles; concept-mapping mediated interviews

1. Introduction

Over the past two decades, an undisputable international trend has emerged in education quality management: a decentralization of responsibility (e.g., Gamage, 2005; Galiani, et al., 2008; Kameshwara et al., 2020). Schools are increasingly tasked not only with delivering high-quality education but also with being accountable for their educational outcomes (Leithwood & Earl, 2000). This trend demands that schools navigate a multifaceted landscape of expectations, including meeting minimum standards and adapting to evolving external demands, such as changes in education policies, shifts in regulations, and stakeholders' reactions to low academic performance (Ball, 2016).

Schools can address this by integrating school development into their educational practice, and imlementing measures that align with their specific local contexts (Ylimaki & Brunderman, 2022). A collaborative approach to this can contribute to improved outcomes and reduce resistance among teachers to change processes (Hargreaves, 2019). Therefore, scholars have been advocating for a bottom-up approach for decades, aiming to achieve sustainable, context-specific, and schoolwide supported changes (Damber et al., 2022). In this sense, school development is perceived as a participatory process involving various actors, including school staff, students, and parents (Hargreaves, 2019; Hillen, 2020). It also supports the principles of collaboration within a safe environment, aimed at preparing pre-service teachers for inclusive education, meaning the participation of all students, regardless of their backgrounds and abilities, in all aspects of school life (Thomas, 2013; Van Peteghem & Consuegra, 2021).

As promising as participatory school development is, it also faces numerous challenges (Damber et al., 2022; Tveit & Kovac, 2020). One prominent issue is the dynamics among participants with diverse profiles. Recently, the roles of diverse actors in collaborative settings for school development have been studied, indicating that collectively improving educational practices requires the adoption of new identities and roles by the involved actors (e.g., Antonsen et al., 2024; Cook-Sather, 2020; Sjölund et al., 2023). A comprehensive understanding of these roles and their dynamics is assumed crucial for successful processes of school development (Tseng et al., 2018). This exploration seeks to clarify the mechanisms that promote mutual collaboration among actors with diverse backgrounds and positions, ultimately empowering all stakeholders and facilitating the achievement of inclusive educational practices.

1.1 Participatory School Development through Collaborative Research

Rooted in equity studies, Cochran-Smith and colleagues (2016) note that creating inclusive and participatory learning environments for the purpose of school development is a profoundly complex endeavor. They argue that while general principles of practice exist, there are no universal formulas for teaching for equity, providing resources for equal outcomes (Cochran-Smith et al., 2016; Levinson et al., 2022), across diverse student backgrounds and the myriad socioeconomic, cultural, and structural characteristics of schools. Collaborative research emerges as a potent approach advocated by various

scholars to address these complexities. It is characterized by a systematic process of inquiry-informed learning, fostering ongoing dialogue among teachers and other stakeholders. This collaborative endeavor aims to uncover professional dilemmas and challenge assumptions within educational practice (Crockett, 2002). Through this process, educators develop context-specific knowledge by collecting and analyzing data, leading to evidence-informed educational practices and greater learning success and equity for all students (Catelli, 1995; Cochran-Smith & Lytle, 1992; Fishman & McCarthy, 2000; Henson, 2001; Zeichner, 2003). The journey through collaborative research encompasses distinct stages, including questioning, data collection, evidence examination, action implementation, and evaluation (Coburn & Stein, 2010; Levin, & Rock, 2003). These stages provide opportunities for reflection and adjustment based on findings, ensuring a dynamic and iterative process aimed at continuously improving educational outcomes and fostering the inclusivity in the school.

Echoing Dewey's advocacy, collaborative research emphasizes not only teachers' role as researchers but also the importance of collaborative endeavors beyond individual classrooms (Dewey, 2001; Burnaford, 1999). Educational policy and research consistently underscore the promise of teacher collaboration in promoting school reform, improvement, and professional development (Honingh & Hooge, 2013). Collaborative research emerges as a vital model for continuing professional development, empowering teachers to transform their pedagogical practices towards inclusion as it fosters collective inquiry, shared learning, and meaningful action to address the diverse needs of all learners (Juma et al., 2017). By bridging university, teacher education and school contexts, hybrid spaces can be created, fostering mutual benefit and enriching the collaborative process (Zeichner, 2014). School leaders play a critical role in cultivating such spaces through specific actions that promote participatory school development, facilitate professional learning communities, and engage stakeholders (McGhie-Richmond & Haider, 2020). Yet, further research is necessary to explore the multifaceted factors that facilitate or hinder collaboration among school leaders, teachers, pre-service teachers and teacher educators, advancing the development of inclusive education.

To improve educational practice as a team, disruptions to the familiar roles has proved to be crucial (Mitra & Gross, 2009). When patterns are disrupted, questioned, or conflicts arise, it fosters reflection and dialogue, opening avenues for reassessing assumptions, beliefs, and practices (Cook-Sather & Alter, 2011). Willegems (2020) outlines four types of disruption in collaborative research teams: (1) groupthink disturbance, prompting participants to critically reflect on their existing beliefs, (2) introduction of unwelcoming evidence, inviting participants to reevaluate their positions, (3) student voice empowerment, challenging traditional power dynamics and introducing novel viewpoints, and (4) mastery experiences, boosting confidence and motivation. Collaborative research inherently possesses transformative potential (Nelson, 2021; Mayes et al., 2021). However, despite the ample opportunities for disruptions, it is noted that this format does not automatically lead to improved educational practices (Willegems, 2020). The success of disruptions depends on how the involved actors, with their diverse emotions, intents, and responsibilities, respond to these situations (Black & Mayes, 2020). Understanding this complex interplay between actors is therefore essential for successful participatory school development.

1.2 Participatory School Development through Collaborative Research

Clear responsibilities of team members appear essential for good participatory team functioning in collaborative research settings (Stewart et al., 2005). Taxonomies of team roles help in understanding members' behaviors, indicating dominance, sociability, task orientation, and related intents and responsibilities (Burke et al., 2019; Driskell et al., 2017). For instance, the dynamic Team Role Typology model by Mumford et al. (2008) comprises ten team roles divided into three categories: a) task roles that focus on the successful completion of the task, including organizing (contractor), structuring (creator), substantiating (contributor), developing action (completer) and critically questioning (critic); b) social roles that ensure cohesion within the team, including supporting each other

(co-operator), communicating invitingly (communicator) and initiating discussions about the functioning of the team (calibrator), and c) boundary-spanning roles that aim to connect the teams' work to the school community, including informing (consul) and aligning (coordinator).

Previous research indicates that unclear allocation and understanding of roles in collaborative research lead participants to interpret and assign responsibilities according to their own understanding (Strijbos & Engels, 2023). This results in differing expectations among participants, causing frustration when team members perceive others not fulfilling intended responsibilities, hindering collaboration from reaching its full participatory and transformative potential.

Recent studies have explored the roles of individual actors in collaborative research settings for school development, some of which are pertinent to this study. The study conducted by Antonsen et al. (2024), interviewing 26 novice teachers in a Norwegian school about their roles in school development, highlights that in bottom-up initiatives they all assume the role of creator, contrasting with top-down imposed interventions. In this role, novice teachers actively collaborate with colleagues, taking an inquiring and reflective stance, to enhance educational practice. In a survey study of 460 Estonian teachers, Oppi et al. (2022) explore their readiness to embrace the role of teacher leader in school development processes. The findings suggest that teachers in schools with more distributed leadership or an innovative school culture are more willing to take on an active, leading role. In her review article, Cook-Sather (2020) delineates how students can embody the role of change agents by asserting their voices in school development processes. She emphasizes the importance of adults within the team facilitating these active roles of students and following up on their input to ensure they feel recognized and valued for their contributions. Furthermore, in a systematic review of 80 articles, Sjölund and colleagues (2023) examined researchers' engagement in collaborative research for school development. The analysis identified eight distinct roles for researchers. Particularly noteworthy is comparing these roles with those of teachers in the team to establish complementary responsibilities, with teachers leading and researchers advising. Lastly, Postholm's (2019) interview research identified three key responsibilities for school leaders in school development: fostering trust within the school to ensure collaborative grounding and direction toward shared objectives, balancing the school's context with external accountability, and overseeing the progress and distribution of leadership roles in development processes.

The above studies each focus on the role interpretation of individual actors, yet the collective response of diverse actors in collaborative research and the roles they subsequently adopt remain underexplored. This highlights the importance of scrutinizing role perceptions, especially concerning one's own conceptualization of roles and expectations towards others, to uncover how disruptions can be positively responded to within diverse research teams (Black & Mayes, 2020). To address this gap, this study conducts retrospective research among participants with different roles within a single case involving a one-year participatory school development process. As such, the research questions in this study are twofold:

- How do various actors in a collaborative research team, in particular trained teachers (coaches), students, teachers, pre-service teachers and the school leader, conceptualize their own roles and those of others when engaging in a school development process?
- What roles do collaborative research team members adopt to enable breakthroughs in the school development process?

2. Methods

2.1 Research Design

This study is designed as an embedded single case study (Yin, 2018), allowing for an in-depth understanding of responsibilities in processes of school development in collaborative research teams (Miles et al., 2014). This method facilitates a thorough exploration of this complex phenomenon within

its authentic real-world context, enabling a comprehensive exploration, description and explanation through multiple perspectives, and thereby potentially enriching theory building (Eisenhardt, 1989; Stake, 2005; Yin, 2018). The adoption of a single case study design is further supported by its revelatory nature, as the first author, being an active member of the collaborative research team, gained firsthand insight into the local dynamics of school development, allowing for deeper interrogation of these dynamics through established relationships with fellow participants (Yin, 2018).

2.2 The case of CityScope Lyceum[2]

The case exemplifies a collaborative research team within the publicly funded and publicly run CityScope Lyceum, led by three trained teachers (referred to as coaches), alongside 12 students, 12 teachers, three pre-service teachers, and a teacher educator (Willegems et al., 2016). CityScope Lyceum is a medium-sized Brussels state school with approximately 1000 students, preparing them for higher education. The school serves a highly diverse population, with a majority of students (90%) living in neighborhoods where peers are two or more years behind in their studies, with a considerable proportion of students not speaking the school language Dutch at home (46%) or receiving a school allowance (40%), while 20% of mothers did not finish secondary school (Departement Onderwijs & Vorming, 2023).

This collaborative research team engages in school development throughout the 2022-2023 school year, focusing on enhancing the student-teacher relationships at school. The team composition was carefully curated by the coaches through voluntary participation and targeted outreach to ensure a heterogeneous group. Participating students, spanning ages 12-18, attend classes across various grade levels and represent different socioeconomic and cultural backgrounds. Teachers in the team exhibit expertise in teaching diverse subjects and age groups.

Figure 1. *Overview of the collaborative research team meetings, following action research phases*

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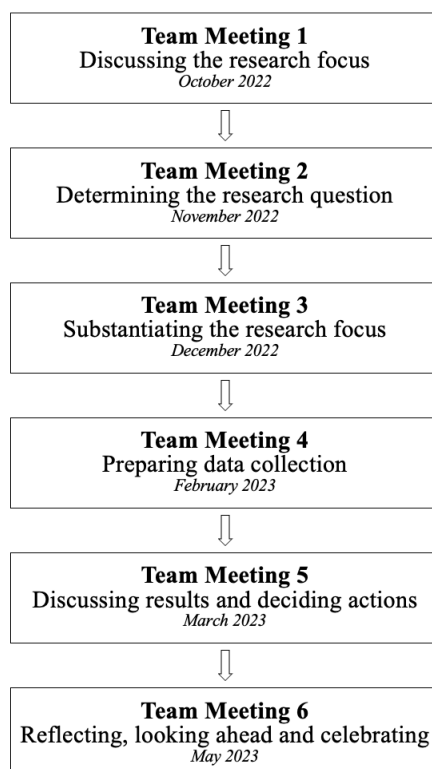
[2] To the case and all participants, a pseudonym was assigned.

The overall goal of the collaborative research team is to design, test, and implement an approach for "student talks", systematic one-on-one feedback and reflection conversations between students and their teachers, strengthening their relationships. This focus aligns with the school's policy plan, emphasizing students' school connectedness and therein the pivotal role of teacher-student relationships (Strijbos & Engels, 2024).

Throughout the school year, the team convenes in six meetings, prepared by the coaches and assisted by the teacher educator, following the phases of action research, as depicted in Figure 1. Although the school is experienced with almost a decade of this kind of trajectories, this is the first edition in which students participate in all stages of the development process, intending to improve educational practices and empower students (Mitra, 2018). This collaborative research resulted in the implementation of five student talks per school year, providing ample opportunities for students to discuss their academic achievement and well-being at school with their teachers.

2.3 Participants

To fully capture the participants' roles, it was decided to select the most heterogeneous group of participants feasible. From the collaborative research team, all coaches (n=3) and all pre-service teachers (n=3) were invited, along with a proportionate number of students (n=3), representing age groups 13-14, 15-16 and 17-18, and teachers (n=4). Additionally, the school leader, who observed and supported the proceedings from the sidelines despite not being an active member of the collaborative research team, also participated in this study. This diverse range of perspectives enhances the credibility of the study (Lincoln & Guba, 1985; Welch & Piekkari, 2017). All prospective participants approached agreed to participate, except for one pre-service teacher who moved abroad at the time of the study. In total, this study included 13 participants with diverse profiles (Table 1). The option of recruiting additional participants was foreseen in case the data would not reach saturation (Hennink & Kaiser, 2022).

Table 1. *Overview of the (anonymized) participants*

Name	Role	Gender
Tom	Staff – Coach	Male
Esther	Staff – Coach	Female
Karen	Staff – Coach	Female
Christine	Staff – Teacher	Female
Elsa	Staff – Teacher	Female
Sven	Staff – Teacher	Male
Angie	Staff – School mentor	Female
Kyle	Student (17-18 years)	Male
Annie	Student (15-16 years)	Female
Sophie	Student (13-14 years)	Female
Stephen	Pre-service teacher	Male
Andreas	Pre-service teacher	Male
Patrick	Staff – School leader	Male

2.4 Data Collection

In May 2023, individual concept map-mediated interviews were conducted to grasp participants' diverse personal role interpretations within the collaborative research team. Respondents articulated their understanding of role allocation and interpretation by creating concept maps during the interviews (Kinchin et al., 2016; Trochim & Trochim, 2007). Unlike traditional interviews, which typically follow a linear structure, concept map mediation encourages participants to actively engage with and refine their understanding as they draw (Kandiko Howson and Kinchin, 2014). The integration of verbal and visual data in real time constitutes a form of data triangulation, enhancing the study's confirmability (Lincoln & Guba, 1985). Moreover, concept map-mediated interviews follow a collaborative approach, which reduces interviewer bias by accurate interpretation of the data through the detailed explanation of the visuals (Kinchin et al., 2016).

The interviews consisted of three distinct sections: (1) individual contributions, in which participants described how they experienced the collaboration on school development and what their contribution was to the teamwork; (2) perception of own roles, in which participants reflected on their own contributions to the teamwork; and (3) perceptions of others' roles, in which participants indicated which roles they believed other actors had taken on.

In the latter two sections, participants were asked to construct a concept map depicting both their own roles and those of others, drawing upon the role typologies outlined by Mumford et al. (2008). During these exercises, participants were invited to provide nuanced insights into their understanding, experiences and application of these roles.

Interviews with adult participants typically lasted approximately 45 minutes, while those with students took around 30 minutes. Interviews were conducted on-site at the school and were scheduled by the school's administrative assistant on time slots available in the agendas of the school leader, coaches, teachers, and students. For pre-service teachers, arrangements were made for online interviews.

2.5 Analysis

The 13 interview audio recordings were transcribed and uploaded into MaxQDA software for analysis, which unfolded in two phases. In the initial phase (RQ1), a double deductive analysis was conducted to analyze the involvement of actors and their associated responsibilities. Line-by-line coding was used to both identify the actors in collaborative research, including coaches, teachers, students, pre-service teachers, or school leaders (Willegems et al., 2016), and team roles, as defined by Mumford et al. (2008). For each actor, their self-reported and assigned roles were synthesized.

In the second phase (RQ2), text segments wherein participants described breakthroughs in the process of school development were identified. This selection was guided by the conceptualization of constructive disruptions, in which an enabler (e.g., students participating in collaborative research) yields a transformation (e.g., new workflow) (Willegems, 2020). These segments were submitted to thematic analysis, with each code capturing the essence of the breakthrough (Braun & Clarke, 2006). The codes were then organized into consistent themes, named according to the enabler of the disruption. To ensure reliability, the negotiated agreement approach was employed (Campbell et al., 2013). Two or three researchers independently coded five transcripts in each phase, which were then collectively reviewed and discussed to achieve a shared interpretation. Following this, transcripts were distributed among the research team for further individual coding.

3. Results

3.1 Conceptualizing Roles

The following sections outline contextualized descriptions of the roles that actors in the collaborative research team assign to themselves and how they conceptualize them. These self-assigned roles are subsequently compared with the expectations set by other team members, as illustrated in Figure 2.

3.1.1 Coaches

Own perception. Together, the three coaches cover nearly the whole spectrum of team roles, with each leading in areas that match their individual strengths and expertise. As creators and constructors, they define the vision and objectives of the school development project, outlining its strategic direction and organizing team meetings. While Karen and Tom actively participate, Esther takes the lead in this aspect. The coaches act as critics, questioning decisions and plans proposed by team members. They prefer to internally assess the feasibility of proposals rather than doing so in broader team meetings, fearing to influence or even manipulate the team and thereby hindering the open culture of participation. They act as completers of the teams' plans by executing and organizing student talks. Karen fosters team cohesion as a co-operator, encouraging active engagement, while Tom excels as a communicator, ensuring transparency about project progress. Despite occasional tensions, particularly from resistant teachers outside the collaborative research team, the coaches adopt the role of calibrators. They establish and monitor team norms to address these challenges, although they perceive this aspect as a vulnerability. The coaches also bridge boundaries within the school community, serving as consuls to relay team actions and outcomes and as coordinators to integrate the team's work into institutional policies and structures.

Other actors' perception. The other respondents confirm that the coaches fulfill multiple, quasi all roles, making them "*catalysts*" (SchoolLeader_Patrick_Excerpt7) of the school development process. In their planning sessions, they act as creators, determining the project objectives and translating them into actionable ideas. Next, they present these plans to the collaborative research team, overseeing task delegation and timing (contractors), and often executing tasks themselves (completer). Pre-service teacher Kyle summarizes their pivotal role:

> "They meticulously prepare meetings, keeping the process on track. They're the guiding force, steering the project's direction. While they value input from other team members, they retain final decision-making power on meeting agendas and priorities." (StudentTeacher_Kyle_Excerpt26).

During team meetings, coaches excel as communicators, fostering understanding of different perspectives and collaboration among team members, while also providing valuable critique to refine ideas and ensure project alignment. As a result, some respondents attribute to them the roles of co-operator and critic.

3.1.2 Students

Own perception. Students indicate a limited number of roles within the team. They act primarily as contributors, representing the student perspective by sharing their insights about the design, organization and approach to student talk. They also consider themselves critics when discussing issues and suggesting improvements (e.g., refining student questionnaires). While they appreciate their contributions being valued and integrated into the team's design, they also feel pressure to participate and struggle with unfamiliar jargon during meetings. Additionally, students identify as co-operators, bridging connections between teachers and peers both within and outside the team. Finally, students
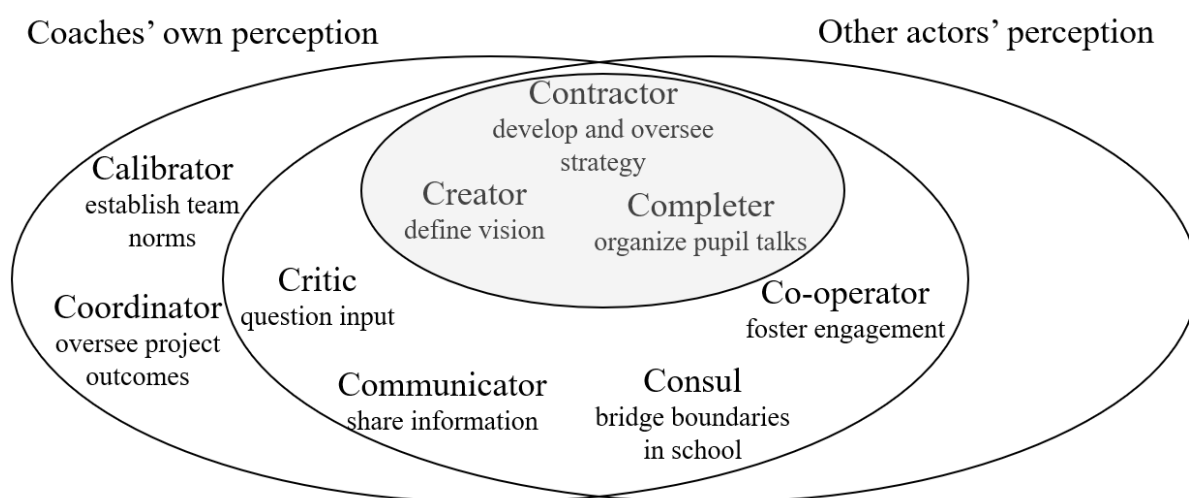
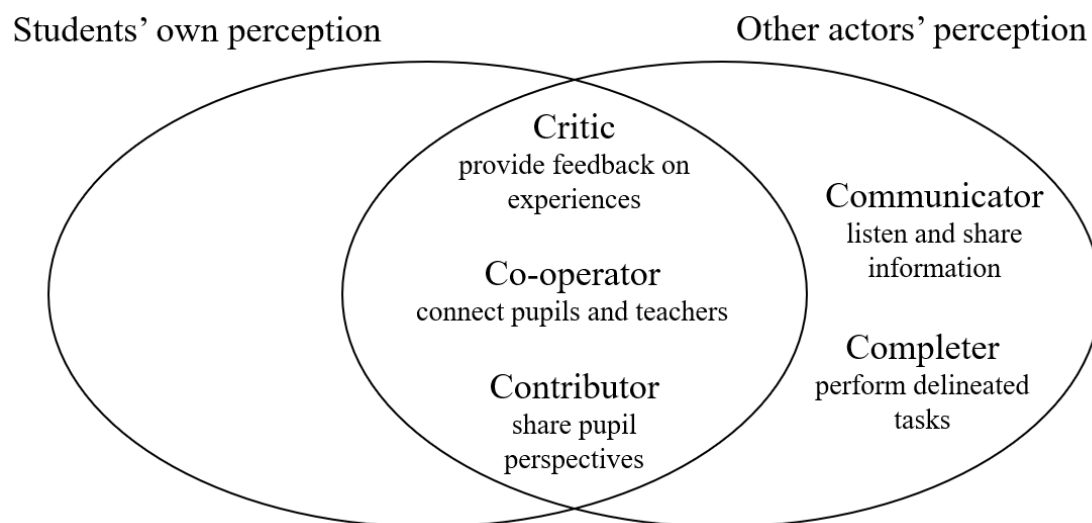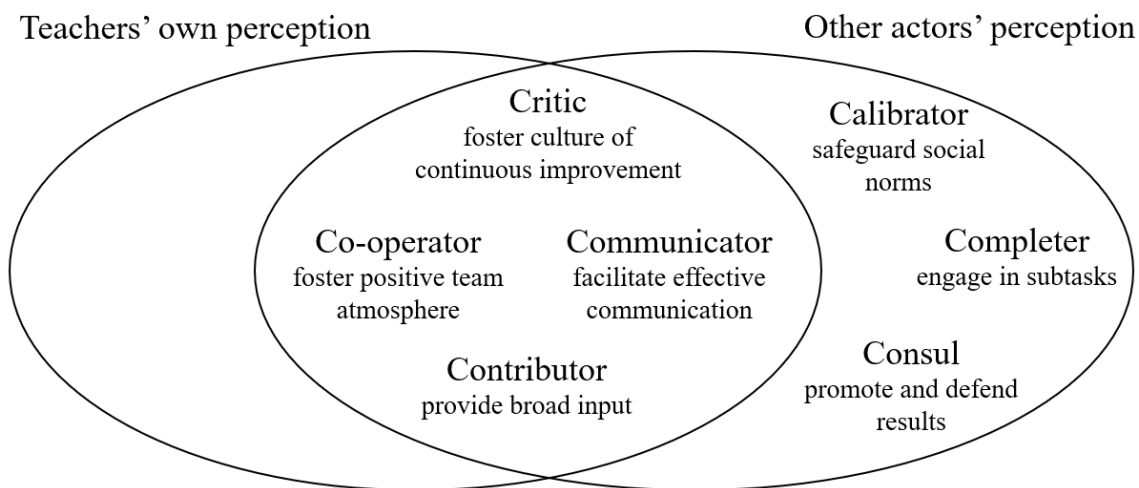report that collaborating with adults has strengthened their sense of equality and ownership within the team.

Other actors' perception. Team members acknowledge the contributor and critic roles that students ascribe to themselves. However, some participants note that students often take on these roles passively, essentially acting as performers. The school leader envisions greater potential:
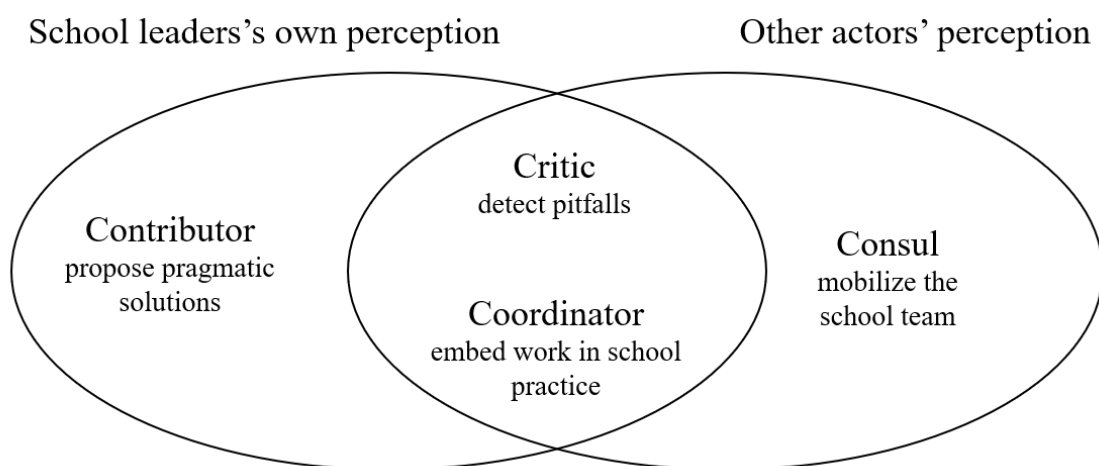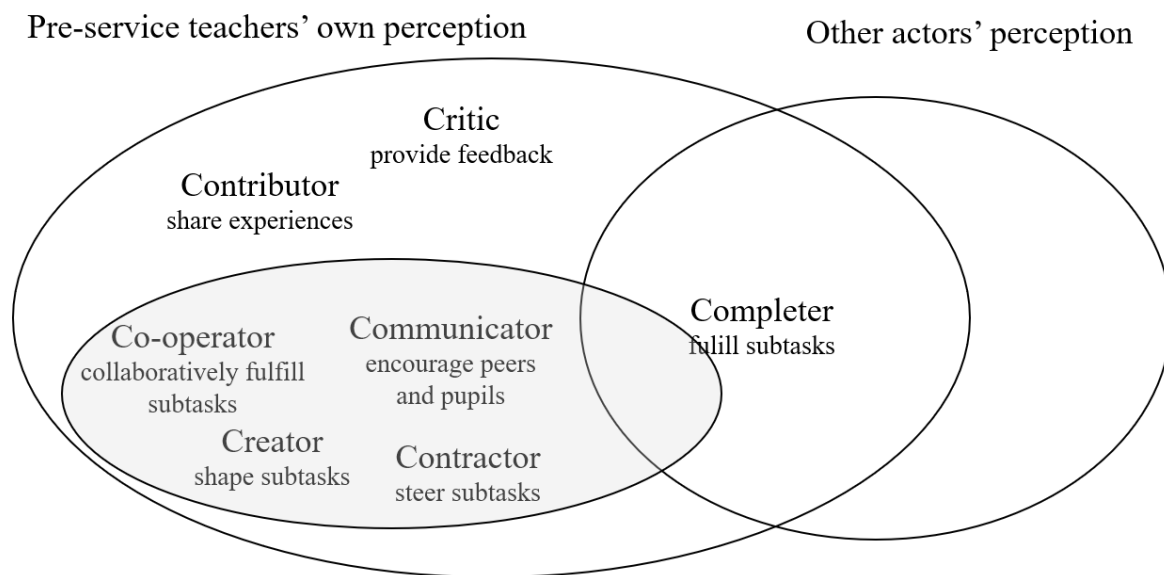
> "Students approach the meetings much like their regular classes. That's my impression, my perception of it. They engage with the notion of "we're joining the team, you'll assign tasks, we'll complete them, and then our role is fulfilled." In the long run, I believe that if children become accustomed to this process, we can achieve much more than what we're currently accomplishing." (SchoolLeader_Patrick_Excerpt17).

Several participants also see students fulfilling the roles of co-operator and communicator, engaging with the team to "collaboratively shape outcomes, and make joint decisions" (Teacher_Christine_Excerpts26-27). This leads to effective dialogue within the team, facilitating the exchange of perspectives and information among students and teachers, advancing the project.

While student participation in the collaborative research team is highly appreciated, there is a collective aspiration to enhance their roles and grant them greater responsibilities in the school development process. This could involve more proactive engagement in existing roles or the introduction of new roles such as ambassador or creator.

Figure 2. Actors' own and perceived team role allocation and conceptualization in collaborative research teams for inclusive school development

Teachers' own perception

Other actors' perception

Critic
foster culture of
continuous improvement

Calibrator
safeguard social
norms

Co-operator
foster positive team
atmosphere

Communicator
facilitate effective
communication

Completer
engage in subtasks

Contributor
provide broad input

Consul
promote and defend
results

Students' own perception

Other actors' perception

Critic
provide feedback on
experiences

Co-operator
connect pupils and teachers

Communicator
listen and share
information

Contributor
share pupil
perspectives

Completer
perform delineated
tasks

Pre-service teachers' own perception

Other actors' perception

Critic
provide feedback

Contributor
share experiences

Co-operator
collaboratively fulfill
subtasks

Communicator
encourage peers
and pupils

Completer
fulill subtasks

Creator
shape subtasks

Contractor
steer subtasks

School leaders's own perception

Other actors' perception

Contributor
propose pragmatic
solutions

Critic
detect pitfalls

Coordinator
embed work in school
practice

Consul
mobilize the
school team

3.1.3 Teachers

Own perception. Teachers perceive themselves as active participants in the team, fulfilling various roles in advancing school development. First, they argue to be contributors, offering valuable insights and experiences across a wide range of grades and subjects. Additionally, some teachers take on the role of critic, fostering critical thinking by identifying potential shortcomings and initiating discussions to address them, promoting a culture of continuous improvement. Moreover, teachers serve as co-operators and communicators, actively maintaining a positive atmosphere and facilitating effective communication. They engage in constructive dialogue, even when faced with criticism, ensuring that all team members feel heard and valued. Despite some teachers feeling hesitant due to their relatively new position within the school, they underscore the importance of these roles in fostering constructive school development processes.

Other actors' perception. Other actors concur with the roles attributed to teachers but envision additional responsibilities for them. These roles are currently embraced to a limited extent, primarily by a few teachers within the team. For instance, some teachers take on the role of completers by voluntarily assuming extra tasks beyond team meetings, such as assisting in "*logistically preparing for the meeting*" (Coach_Esther_Excerpt26). Furthermore, some teachers act as calibrators by advocating for school-internal norms or standards to uphold a positive, constructive atmosphere within the team. Esther exemplifies this: "*When Sandy [teacher] cynically remarked to some students, 'If you guys can explain it so well, why don't you join the student council?', Samuel [teacher] responded very well. He excels in connecting with others in such situations.*" (Coach_Esther_Excerpt26). Finally, there are opportunities for teachers to serve as consuls, supporting the implementation of developed outcomes within the broader school context by explaining, demonstrating, or advocating for them. Patrick underscores this: "*Teachers are proud of what has been developed and I notice that they defend it when it is criticized.*" (SchoolLeader_Patrick_Excerpt17).

3.1.4 Pre-service teachers

Own perception. At the outset, the pre-service teachers felt uncertain about their roles within the team. However, with guidance from coaches and teacher educators, they gradually gained clarity. They focus on substantiating the design of student talks with literature and preparing and monitoring its implementation. Primarily, they see themselves as completers, responsible for delineated subtasks like developing surveys and organizing workshops. To manage these tasks, they establish a pre-service teachers subproject group, in which they assume various roles to support its self-directed approach. Serving as coordinators, communicators, and collaborators, they conduct meetings, negotiate agreements, and ensure follow-up. Moreover, they collectively shape and steer these subtasks, embodying the creator role in the process.

Concerning their participation in the team meetings, pre-service teachers, like Kyle, acknowledge the challenge of finding their footing:

> "I didn't have the most active role in the meetings because I sometimes felt overwhelmed by the various methods being used, which made it challenging to understand our specific objectives. Consequently, I often found myself unsure of what to contribute and tended to remain on the sidelines until explicitly prompted to participate." (StudentTeacher_Kyle_Excerpt6).

Nonetheless, they assert their role as contributors by proposing subtasks aligned with school development goals. To optimize the process, they take on the role of communicators in the team meetings, encouraging students' engagement and sharing experiences actively. As both critics and

contributors, they offer constructive feedback, drawing from the developed theoretical framework to enhance project quality and monitor progress, thus anchoring their contributions in the project outcomes. **Other actors' perception.** The other collaborative research team members confirm that pre-service teachers primarily serve as completers within the project, focusing on specific tasks like preparing activities for team meetings or conducting literature research. These actors underscore the importance of further involving pre-service teachers in the school development process. Enhancing their engagement will not only strengthen project outcomes but also foster the professional skills of future teachers. School leader Patrick advocates this:

> "We should definitely involve them more. As teachers, sometimes we tend to be a bit controlling, wanting to oversee everything and ensure it's done right. But it's essential to give our pre-service teachers more opportunities to engage. After all, they aspire to become teachers themselves, so providing them with practical experience is crucial." (SchoolLeader_Patrick_Excerpt17)

3.1.5 School Leader

Own perception. The school leader envisions several roles for himself throughout the process of school development. First, he assumes the role of contributor by offering insights and solutions to the coaches when they encounter impasses. Thereby he fosters an environment of open dialogue for them to explore new perspectives. Notably, he leverages expertise in organizing to find pragmatic solutions. Moreover, the school leader adopts the role of critic towards the coaches, assessing the viability of their ideas. He offers forthright feedback, with a keen focus on the potential hurdles that may impede the implementation of the proposed initiatives. This helps the coaches understand the prospects and pitfalls of their efforts. Finally, the school leader fulfills the role of coordinator, contextualizing the school development process within the broader school practice and ensuring its seamless integration. He communicates how the school development process aligns with and advances the school's vision to staff and students. While actively engaging in these roles, the school leader recognizes the importance of his supportive presence for the coaches, thereby empowering them throughout the school development processes.

Other actors' perception. Respondents with other roles largely confirm the school leader's position. They recognize him primarily as a coordinator, despite his limited presence in team meetings. Nonetheless, they value his support, especially in encouraging and enhancing the coaches' work. Coach Esther explains:

> "Tom occasionally feels frustrated by the absence of the school leader. Personally, I appreciate it. For me, it instills confidence. ... There were certain decisions he was hesitant about this year, such as our immediate implementation of student talks on a schoolwide scale. ... In December, we faced considerable criticism from teachers in this regard. Despite his reservations, he steadily supported us. He also deals with any rude worded concerns." (Coach_Esther_Excerpt62)

The pre-service teachers affirm the school leader's role as a critic, providing feedback and helping in setting realistic expectations. Lastly, the collaborative research team relies on the school leader as consul, specifically in communicating the project's goals and outcomes to the wider school team. While the school leader acknowledged this responsibility, respondents propose an even more active involvement in bridging the gap between the work of the team and the broader teaching staff, as suggested by Christine: "*I think it would be positive if the school leader had a share in that [school development process] and actually explicitly says that he supports it*" (Teacher_Christine_Excerpts35-36).

3.2 Roles Enabling Change

The second phase of the analysis reveals that actors overall report four categories of breakthroughs in the process of school development, specifically (1) connecting communication and interaction, (2) enriching diversity of perspectives, (3) supportive leadership, and (4) a guided process of co-creation. Unlike roles, which clarify who performs which functions within the team, these drivers highlight the collaborative dynamics that contribute to meaningful progress in school development. The following sections explore how specific team roles are associated with each of these drivers. Figure 3 depicts these findings schematically.

3.2.1 *Connecting Communication and Interaction*

The actors unanimously indicate that communication and interaction, aimed at constructive cooperation among team members, have been key to the process of school development. As the coaches embody the team roles of co-operator and communicator, they foster a positive atmosphere that encourages participation in team meetings, reflected in the sentiment that "*people like to come*" (Coach_Tom_Excerpt24). Respondents note the establishment of an environment where equality reigns among teachers and students, characterized by openness that invites participants to freely express their opinions. Coach Karen exemplifies, "*Students no longer said 'Mr., Mrs.' but called us by our first names, so yeah, that was pretty cool*" (Coach_Karen_Excerpt6). This strengthens team members' sense of connectedness, as articulated by teacher Sven: "*the added value was that I felt more connected to colleagues and to the school*" (Teacher_Steven_Excerpt7), encouraging active engagement and responsibility for collaboratively finding innovative solutions to local challenges.

Figure 3. Outline of team roles inducing breakthroughs in the school development process

3.2.2 *Enriching Diversity of Perspectives*

"In our team meetings, we made sure everyone, students, teachers, and pre-service teacher, had a voice, and we took action based on their input." (Coach_Tom_Excerpt37). Respondents agreed with the importance of embracing diverse perspectives in school development, as it brings attention to relevant issues that otherwise might be overlooked and fosters rich and varied discussions. Undoubtedly, students as contributors and critics have been pivotal in this process. Tom emphasizes, "We listened closely to the students' voices, making sure they weren't overshadowed by the louder voices of teachers." (Coach_Tom_Excerpt37). Similarly, teachers with diverse teaching assignments, spanning different age groups and subject areas, were engaged. A teacher explains how her unique perspective from the field of physical education complements discussions on teacher-student relationships, distinct from teachers

in traditional academic subjects (Teacher_Christine_Excerpt9). Additionally, teachers outside the collaborative research team were encouraged to provide critical input to the development process, which was highly appreciated and led to less resistance and, consequently, smoother implementation of student talks.

3.2.3 Supportive Leadership

Several facets of leadership play pivotal roles in successful school development processes. A constant driver of success is strengthening the link between the team and the school, anchoring in the role of consul. This occurs when the team members, like Christine, extend the positive atmosphere of collaborative teamwork, inviting for cooperation and mutual support, to the broader school community.

> "We faced particular pushback from teachers outside the team who were unfamiliar with our initiatives, and who suddenly had to engage in student talks. Of course, that's not so easy. I've consistently upheld loyalty to the team and aimed to convey it positively. When colleagues expressed criticism, I made efforts to address it." (Teacher_Christine_Excerpt14).

Moreover, the engagement of leaders, like the school leader or coaches, proves crucial. When encountering resistance from the wider school staff, they shoulder the critique, mediate to address conflicts, thereby safeguarding the team and its functioning. Finally, the explicit recognition of outsiders, e.g., teachers or the school leader, is supportive of the team. Their involvement and open approval instill confidence among the team members and help reduce resistance from other colleagues.

3.2.4 Guided Process of Co-creation

A structured and guided approach to co-creation is pivotal for achieving a supported and quality outcome. Respondents acknowledged the coaches' numerous and complementary efforts, as creators and constructors, in fostering positive collaboration among team members, even within time constraints, in effectively organizing meetings and in sustaining momentum. The streamlined approach to decision-making, involving proposal, discussion, and collective refinement of ideas, enables efficient progress and adaptation to unforeseen challenges. The coaches prepare the team meetings in a smaller sub team. Coach Esther reflects,
"While we [coaches] have a general direction in mind, the specific path has not yet been determined. Therefore, we predefine various options and delegate decision-making to the larger team. ... That's how I perceive our approach. Tom considers this manipulation and has expressed concerns, but what is the alternative? I still believe they [team members] have the opportunity to voice their opinions. But yes, it is true, setting parameters beforehand may limit their full say." (Coach_Esther_17).

4. Discussion

The primary goal of this study is to advance our understanding of team dynamics within collaborative research teams. Applying Mumford et al.'s framework (2008), role allocation and conceptualization are investigated, as well as how these roles contribute to breakthroughs in the school development process. The findings indicate that although all team roles are fulfilled, actors' expectations towards each other are only partially met. This highlights the need and potential for creating more genuinely participatory and reciprocal spaces for collaborative research. As Zamecnik et al. (2024) found, teams with a shared understanding of roles tend to perform better in terms of interaction, engagement, and task execution. Notably, some actors, particularlycoaches, pre-service teachers and the school leader, also assign roles to themselves that were not recognized or acknowledged by the other actors. For instance, only the school leader considers himself a contributor, emphasizing his part in offering behind-the-scenes solutions to challenges faced by the coaches. Consequently, this role is not widely recognized by most

other actors. Another example includes pre-service teachers who themselves state to provide substantive feedback, as critics, during team meetings, yet these contributions are not perceived in the same way by other team members. Conversely, certain actors, such as the school leader, students and teachers, have been assigned roles by other actors that they, when reflecting on it, report not to have incorporated. Students and teachers, for example, do not perceive themselves as completers, responsible for specific subtasks, despite attempts by other actors to assign them this active role. These findings confirm previous evidence of ambiguous role allocation among actors in collaborative research (Strijbos & Engels, 2023). This phenomenon can partly be explained through a micropolitical lens, where individual actors pursue personal intentions in assigning and interpreting team roles (Kairienė, 2018). An additional explanation may lie in an initial divergence in goals or motivations among team members at the outset of the school development process (Iacob & Faily, 2019), as well as in the intergenerational composition of the team, where age or generational differences influence the extent to which individuals are naturally oriented toward collective engagement (Williams et al., 2011).

In collaborative research contexts, where formal hierarchies are often absent and roles remain implicit (Hargreaves, 2019), divergent interpretations may grow. This underscores the importance of explicit communication regarding team roles. Without clear agreements and joint reflection, participants may form assumptions about their own and others' roles based on individual perspectives rather than shared objectives. Such misalignments can lead to misunderstandings, role conflicts, and ultimately reduced team effectiveness (Driskell et al., 2017).

Interestingly, certain actors within the collaborative research team are associated with specific role categories from Mumford et al.'s (2008) typology. First, coaches and teachers embrace social roles such as communicator and collaborator. According to Driskell et al. (2017), these are key to teamwork as they foster positive social behavior by enhancing group cohesion and strengthening socio-emotional relationships. This emphasis on social roles in teamwork resonates with findings from Burke et al.'s (2019) research, who found that entertainment occupies a prominent place in teamwork and that team building becomes more important the longer the duration of assignments. Additionally, Driskell et al. (2017) connect this focus with the relative contribution perspective, which illuminates the importance of particular roles based on team composition (e.g., by counteracting excessively critical viewpoints) and desired outcomes (e.g., by valuing consensus as an outcome). Secondly, coaches and the school leader adopt boundary-spanning roles. Contrary to Postholm's (2019) findings, it appears that not only formal managers but also other actors, such as coaches, can oversee and take responsibility for the process. This finding is supported by Oppi et al.'s (2022) research, demonstrating that coaches assume leadership roles in collaborative research teams, partly due to the school leader's willingness to share responsibility and the supportive nature of the innovative school culture. Finally, students and teachers primarily adopt passive task-oriented roles, such as contributor and critic, while the pre-service teachers and coaches assume the more active task-oriented role of completer. Antonsen (2024) has previously noted that passive contributions, where participants act as passengers, are widespread among teachers who perceive the school development process as imposed from above. The findings of this study indicate that, despite the autonomy granted by their school leader, it is primarily teachers who, during interviews, reflect on their position within the broader team and acknowledge that their role is relatively limited compared to that of other actors. They openly question how they might contribute more actively and meaningfully to future school development processes in a feasible way. Some propose taking initiative for sub-tasks or supporting the coaching team. However, the potential for students and teachers to take a more active role should be further investigated in both practice and research.

Essentially, the findings affirm that, according to the perspective of the participants, the allocation of roles tends to be rather traditional. This prompts consideration as to whether such traditional role allocation aligns with the reciprocity essential for genuine collaborative research activities (Zeichner, 2014). In this regard, Mumford et al. (2008) suggest that the role repertoires of the actors involved, particularly the range of roles actors can perform, should be expanded. Indeed, a broad repertoire not

only fosters adaptability among team members across various contexts during the school development process (Mumford et al., 2008), but also contributes to a sense of equity and collective responsibility within the team, a hallmark of collaboration (Juma et al., 2017). To achieve this, Mumford et al. (2008) advocate for bolstering role knowledge.

The second research question examined which roles nurture breakthroughs in the transformative process of school development: co-operators and communicators enhance communication and interaction, contributors and critics enrich diverse perspectives, consuls provide supportive leadership, and creators and contractors guide cocreation. This finding operationalizes the conditions for transformative school development, involving students, as synthesized by Pearce and Wood (2019), across dialogic (communication), intergenerational (perspectives), transgressive (leadership), and collective and inclusive (cocreation) domains. Furthermore, it reveals that these pivotal roles, capable of actual achieving the transformative potential of the school development process, are enacted in a complementary manner by multiple actors. The success of this collaborative research likely stems from diverse actors embracing roles pivotal to breakthroughs, inspired by the concept of hybrid space. This concept encourages actors to transcend their usual boundaries and reassess their approaches (Zeichner, 2014).

4.1 Limitations and Future Research

While this study advances our understanding of the dynamics of team roles in collaborative research, some limitations are acknowledged. A first concern relates to the research design. A single case study was chosen as it has the potential to provide an in-depth depiction and analysis of a complex reality (Yin, 2018), closely related to the research questions. However, the findings only relate to the case study itself, CityScope Lyceum, and cannot be extended to other schools or disciplines (Gustafsson, 2017). In addition, the first author assumed an active role within the collaborative research team at the school. Although the first researcher's involvement did not overlap with the data collection period and provided valuable, in-depth insights into participants' experiences, there is still a risk that this involvement may have influenced how the data was collected and interpreted. To reduce this risk, several measures were taken, including a rigorously structured data collection protocol, peer debriefing within the research team, and member checking with a subset of participants (Roulston & Shelton, 2015). Nevertheless, future research would benefit from adopting a design that more robustly supports both the credibility (Finlay, 2006; Kuper et al., 2008) and generalizability of the findings. Potential approaches include a meta-study, analyzing multiple individual case studies (Hays & McKibben, 2021), a multiple case study design, selecting cases for their different contexts to detect context-independent patterns (Eisenhardt, 1989) or a social network analysis, mapping the social relations among collaborative research team members (Kolleck et al., 2021).

Second, this study provides valuable insights into role allocation and conceptualization by actors within collaborative research teams. Yet, the reality of school development is more complex than these internal team dynamics. The findings indicate that the connection of the collaborative research team to the broader school community plays a critical role in achieving a successful process of change and in implementing the results at school. This observation thus invites for further exploration of the relationship between the collaborative research team and the broader school team.

This study primarily adopts an instrumental approach, reflected in the interview protocol prompting participants to discuss the roles they assumed and perceived in others, and the improvements they envision in this regard in seeking optimal teamwork and outcomes (Driskell et al., 2017). However, little attention has been paid to participants' emotional drivers, despite clear findings in micropolitical research that they are determinants of behavior in teams (e.g., Blase, 1987). It should therefore be hypothesized that the emotional intentions of team members influence the responsibilities they shoulder. Therefore, future research examining participants' intents could complement our findings.

Finally, this study reveals that pre-service teachers often assume more roles than are acknowledged by their team members, which undermines collaboration and the creation of a safe space, both essential for preparing them for inclusive education (Van Peteghem & Consuegra, 2023). Future research should therefore closely examine the role of pre-service teachers in diverse teams, both in terms of research focus and intervention.

4.2 Implications for Educational Practice

The findings of this study hold important implications for school teams engaging in school development through collaborative research. The finding that various actors interpret role allocation and responsibilities within the team differently suggests that fostering positive team dynamics and equality among members requires deliberate attention.It is therefore recommended to invest in professional development even before the school development process begins. These efforts should help team members better understand both their own role and those of others. Specifically, such professional development should focus on building competencies at two levels: (1) task-related competencies, which are necessary to carry out the substantive work (e.g., initiatives that promote joint knowledge building), and (2) team-related competencies, which support collaboration within the team (e.g., training in generic teamwork skills) (Driskell et al., 2017). This study can particularly support the development of team-related competencies by offering school teams a practical framework. The framework helps teams by identifying the critical roles, as described by Mumford et al. (2008), that actors must collectively assume to achieve successful school development, by fostering awareness of each actor's own role and that of others, and by supporting mutual dialogue about shared responsibility in achieving school development.

Acknowledgements

Disclosure statement
The authors confirm no conflict of interest exists.

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