

# BOUNDARY COMPETENCIES IN INTERPROFESSIONAL LEARNING TEAMS

THE DEVELOPMENT OF INTERPROFESSIONAL  
COLLABORATIVE SKILLS AMONG STUDENTS WHO  
PARTICIPATE IN INTERPROFESSIONAL LEARNING TEAMS

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## SUMMARY

Professionals who work in the Dutch context of child, education and care have the overall goal to help children develop their full potential in all developmental areas: emotional, social, mental, cognitive as well as physical. Due to the high degree of specialization and institutionalisation of organizations in this context, people from these different organizations hardly ever meet; even though meeting and collaborating might help them to stimulate children to develop this potential. To collaborate outside one's daily practice is called interprofessional collaboration. This is what the organization Child & Education (K&E) wants future professionals in the context of child, care and education to be able to do. Therefore K&E has implemented a project in which students of different educational backgrounds collaborate on an interprofessional task. In this study the development of participants in these teams is investigated with the question: *In what way do students develop interprofessional collaborative skills when participating in interprofessional learning teams, according to students and supervisors?* Three interprofessional learning teams of K&E participated in this study. The study consisted of three parts: an observation visit, a focus-group meeting with the students and an interview with one of the supervisors of each team. Both the focus-group meetings and interviews were recorded and transcribed. Fieldnotes and transcriptions were both deductively and openly coded using a codebook. Results showed that participating students developed interprofessional collaborative skills to some degree. Also, seven characteristics of students and contexts at the micro and meso level were perceived to be related to the development of these skills. Future research on the development of interprofessional collaborative skills in learning teams could exist out of a survey that participants of such teams fill out before, during and after participation. For the development of this survey instruments and outcomes of this study can be used. A practical implication of this study is to implement professional development for supervisors of interprofessional learning teams.

# 1. INTRODUCTION

Professionals in the context of child, education and care, work in a field that is highly specialized and institutionalized (De Ridder. et al., 2020; Van der Grinten et al., 2019). An example is that teachers and after-school care workers hardly ever meet, even though these professionals face overlapping problems which could be solved if they would collaborate. If children are successful in school, it does not necessarily mean that they are successful in other developmental areas. Following the example, a child with an excellent cognitive score, might have problems in his social development and show the same problematic behaviour in after-school care as in school. To help children develop their full potential caregivers have to focus on all developmental areas: emotional, social, mental, cognitive as well as physical (Slade & Griffith, 2013). Therefore, there is a necessity to combine different sorts of expertise to guide children through their entire development. Collaboration amongst professions in this context is therefore needed.

In practice, it turns out that collaboration across professions is complicated at different levels. At a pragmatic level in the Netherlands, the organization of this is complicated in the context of child, care and education, because of practicalities such as different work hours for educators and after-school care workers (De Ridder. et al., 2020). At a deeper psychological level, interprofessional collaboration is complicated as it requires people to step into each other's territory in which they are unfamiliar and even unqualified (Suchman, 1993). Future professionals, therefore, have to be educated to gain the interprofessional collaborative skills needed when entering professional life.

Innovation cluster *Kind en Educatie* (Child and Education, from here on referred to as K&E) is a Dutch organization that aims to educate future professionals in the field of child, care and education to become skilled in interprofessional collaboration. It brings together universities of applied sciences, vocational educators and a broad network of professional organizations such as schools, childcare organizations and social work organizations (Deddens et al., 2021). In 2019 K&E started a project to bring together all of these organizations with one goal: to help students become skilled at interprofessional collaboration. During the project, students are invited to collaborate with students from different educational backgrounds in the context of child, care and education. This takes place at the professional organizations that offer internships to students, such as childcare organizations and schools. In this project the collaborating groups of students are called: interprofessional learning teams.

Interprofessional collaboration requires that boundaries between professions are crossed (Akkerman & Bruining, 2016). Boundaries are socio-cultural differences between practices that lead to discontinuities in action or interaction (Akkerman & Bakker, pp. 133, 2011). For example, teachers who do not understand the jargon of a social worker have trouble understanding what that social worker is trying to say. Therefore, working between boundaries is not an easy task. It requires people to both have dialogues with the professionals of different practices, and to also have inner dialogues between the different perspectives they can take on (Akkerman et al., 2006). Educating students to become skilled at interprofessional collaboration means teaching them to notice and deal with boundaries.

No research has been executed yet to explore the skills that students acquire during participation in this project. Therefore this research will aim at exploring how the implementation of interprofessional learning teams influences the development of interprofessional collaborative skills of students who participate in these teams.

Here the main research question therefore is:

*In what way do students develop interprofessional collaborative skills when participating in interprofessional learning teams, according to students and supervisors?*

To answer this question the following sub-questions were explored:

- 1. Which interprofessional collaborative skills do students develop when participating in interprofessional learning teams?*
- 2. To what extent do students develop these interprofessional collaborative skills?*
- 3. Which characteristics of students and contexts are perceived to be related to the development of the interprofessional collaborative skills of students when participating in interprofessional learning teams?*

The research was conducted by exploring several cases of interprofessional learning teams in different contexts. All teams were observed during one learning team's meeting and in each interprofessional learning team, a focus group was organised. Also, the supervisors of the students in the learning teams were interviewed individually.

To summarize, K&E aims to educate students to become skilled in interprofessional collaboration. This research investigated the learning process that students go through related to the development of interprofessional collaborative skills when participating in the project of K&E.

## **2. THEORETICAL FRAMEWORK**

In this theoretical framework, first collaboration will be defined, with a specific focus on interprofessional collaboration. The concept of interprofessional learning teams as implemented in the project by K&E is thereafter explained. The theory of boundary crossing then is explained and linked to the context of this research.

### **2.1 INTERPROFESSIONAL COLLABORATION IN THE CONTEXT OF CHILDHOOD EDUCATION AND CARE**

#### **2.1.1 Collaboration**

The term collaboration can vary considerably considering different contexts. For the current research, the definition of Vangrieken et al. (2015) will be used since it is based on 82 studies on teacher collaboration, which is a context that comes very close to the context in which participants of this research are collaborating. Vangrieken et al. (2015, pp. 23) define collaboration as: “Joint interaction in the group in all activities that are needed to perform a shared task.” Collaboration is not static and uniform but can occur in different types and depths (Vangrieken et al., 2015). Therefore collaboration can be called an umbrella term: different collaborative concepts can fit within this term.

For collaboration to work well the relationship between participants is important, but good collaboration is more than only this relationship: joint activities play an equally important role (Katz & Earl, 2010). Consequently, when participants are engaged in intensive interaction, through joint activities, they are expected to open up their practices and beliefs to debate and investigation (Katz & Earl, 2010). When professionals collaborate in an engaged process it facilitates solving mutual issues and spreading innovations beyond single sites (Smith & Wohlstetter, 2001).

#### **2.1.2 Interprofessional collaboration in the context of child, education and care.**

K&E aims at educating future professionals to collaborate between professional services in an interprofessional manner because, in the Dutch context of childhood, education and care, work is increasingly taking place across multiple and diverse settings and contexts (Doornenbal & De Leve, 2014; Ludvigsen et al., 2010). This is not just a trend in the Netherlands but is also seen in other countries such as England and Finland (Katz & Earl, 2010, Vesterinen et al., 2017).



When professionals collaborate outside of their field, this is defined as interprofessional collaboration (Akkerman & Bruining, 2016). This concept is rooted in the cultural-historical activity theory (CHAT) that emerged in the 1920s from the concepts that were formulated by Vygotsky and Leont'ev. CHAT was a new way of looking at human behaviour in which it was explained with a focus on mediated and collective activity (Dochy et al., 2011). This theory was developed over the years and its third generation forms the basis of interprofessional collaboration.

Vygotsky explained that collaboration happens within an activity system in which human behaviour is mediated by the cultural meaning that is given to objects in different contexts (Engeström, 2001; Vygotsky & Cole, 1978). Also, within the activity system, the meaning of complex social interactions plays a role (Dochy et al., 2011). When people cross the boundaries of an activity system and collaborate in the shared overlapping space between systems, interprofessional collaboration happens (Engeström, 2001). At least two different activity systems meet and go beyond the limits of each system to collaborate. In this study, these systems could for example be a primary school and an organization for children's mental health.

Morgan et al., (2015, pp. 1218) give a clear definition for interprofessional collaboration, which will be adopted by the current research: An active and ongoing partnership often between people from diverse backgrounds with distinctive professional cultures and possibly representing different organizations or sectors, who work together to solve problems or provide services. In other words: all important characteristics of collaboration, but with the addition of the diverse and distinctive professional cultures of the different activity systems that participants come from.

## 2.2 INTERPROFESSIONAL LEARNING TEAMS

In an interprofessional learning team students of different educational backgrounds in the context of child, education and care work together to solve a real problem in the work field. Students collaborate, but from their own educational backgrounds. Each team is guided by at least two supervisors: one with a background in either higher or vocational education, and the other is connected to the practical context in which the students are doing their internships (Deddens et al., 2021, pp. 2). Students do not receive a reward for participation.

The goal of K&E is to educate future professionals to be able to collaborate interprofessionally, so that they can function well in the increasingly collaborative field of

child, care and education with the ultimate shared goal of improving outcomes for children (De Ridder. et al., 2020).

‘Learning team’ is originally a Dutch term: *leerteams*, and is used by K&E. However, this term is not currently used in scientific research. In cases where interprofessional work occurs, different descriptions are found.

A used description for a group of people coming together, outside of their everyday community, to engage in collaborative learning to improve outcomes for children is a professional learning network (Poortman et al., 2021, pp. 3). This could entail groups of people within schools, but also across schools and professions. For example when researchers and educators work together on the shared goal to improve math lessons in a classroom.

Similar to professional learning networks is the term professional learning community, which is defined as a group of professionals working collaboratively towards a shared purpose of improvement in instruction and student learning (Doğan & Adams, 2018, pp. 636). Both professional learning networks and professional learning communities can be used in any case where groups of people learn together for a specific purpose: within or across professions (Stoll et al., 2006).

Even though different terms are common in research on interprofessional collaboration, the term interprofessional learning teams was adopted during this research as this is used by K&E. This is based on the assumption that all forms of networked learning are similar in practice, despite the used term. In this research, the following definition of ‘interprofessional learning teams’ was adopted: A group of future professionals collaborating outside of their everyday community of practice, which works towards a shared purpose of improvement in outcomes for children. Members of this group study, work and learn in different sites or organizations, but share mutual goals.

### 2.3 CROSSING BOUNDARIES

When participating in an interprofessional learning team participants will cross boundaries of the activity systems they are used to working within and collaborate in a shared new space . Akkerman and Bakker (2011) define boundaries as social or cultural differences between practices that lead to problems in action or interaction when these different practices meet. Boundaries are for example faced by teacher students who try to combine the practical

approach of the organization of their internship and the more theoretical approach of their university (Akkerman & Bruining, 2016).

In the case of the students who participate in the interprofessional learning teams of K&E: not only do they face the boundaries between their educational institution and their internships, but they also face the boundaries of collaborating across different professions. K&E deliberately puts students in this position (De Ridder. et al., 2020), because once they become professionals they will also be confronted with boundaries, especially when starting to collaborate with people outside of their own profession (Akkerman & Bruining, 2016; Broekkamp & Van Hout-Wolters, 2007).

Boundary crossing refers to a person's actions and interactions across different sites (Suchman, 1993). When crossing boundaries people are put in a situation where they have to collaborate with people with different and complementary knowledge and skills, but also with different and maybe even conflicting rules, tools and patterns of social interaction (Engeström et al., 1995).

Boundaries, when forming a challenge between different systems, are vital forces for innovation and development (Roth & Lee, 2007). Akkerman and Bakker (2011) conducted a literature review and found 181 useful studies on the topic of boundary crossing. In those studies, four main learning mechanisms were identified: identification, coordination, reflection and transformation. These mechanisms operate at three levels: organizational, interpersonal and intra-personal (Akkerman & Bruining, 2016).

In this research the focus is put on the intra-personal learning mechanisms of boundary crossing, to answer the question of which interprofessional collaborative skills students in interprofessional learning teams develop. These learning mechanisms at an intrapersonal level can be operationalised as individual skills (Akkerman & Bruining, 2016). Another term for this is boundary crossing competency, which is defined as the ability to function competently in multiple contexts (Walker & Nocon, 2007, pp. 178). The following section aims to show how in this research the intra-personal mechanisms of boundary crossing (Akkerman & Bruining, 2016) are operationalised as interprofessional collaborative skills or boundary crossing competencies.

### **2.3.1 Identification**

With the mechanism of identification renewed insight emerges into how practices or people are different from each other and how they are complementary (Akkerman & Bakker, 2011).

Hughes and Greenhough (2008) provide a rich example of identification in which a mother helping her son with mathematics homework is described. The mother crosses the boundaries of being the mother of the boy, an enforcer of the homework, and a checker of the homework. The boy is confronted with his role as a son, but also as a low achiever in school. When the boy and the mother are working on the homework assignment together they are crossing boundaries and participating in the process of identification because they are confronted with their distinct identities and become aware of the role they are taking.

In the context of professional learning teams students are working on the boundary-crossing competency of identification when they are confronted with different identities of themselves (e.g. as students, interns, and future professionals in their own context) but also with those of the others participating in the interprofessional learning team.

At an intra-personal level, individuals have mastered the boundary competency of *identification* when they can (re)define how others are different from themselves and recognize how they can legitimately coexist (Akkerman & Bruining, 2016).

### **2.3.2 Coordination**

Coordination refers to the level of effectiveness to which means and procedures are used in order to translate between different sites. An example of such a means or procedure in the context of this study is the effectiveness of the use of e-mail. Using e-mail might mean something different because of different educational backgrounds.

In other words: coordination refers to the effectiveness of the use of boundary objects. Boundary objects are defined as the artefacts that do the crossing because they fulfil a bridging function (Akkerman & Bakker, 2011). Boundary objects have two characteristics: they mean something different to each participant, but they also have enough shared structure to make them useable in both worlds (Star & Griesemer, 1989). Boundary objects are means that translate between differences. An example of smooth coordination is, that there is no redundant dialogue to maintain the efficient flow of work that has to be done, smooth routines have been developed.

At an intra-personal level, an individual has mastered the boundary crossing competency of *coördination* when they can find means or procedures that help smoothly align their own position to the position of others to ensure that shared activities run smoothly (Akkerman & Bruining, 2016).

### **2.3.3 Reflection**

Reflection in boundary crossing refers to coming to realise the difference between the self and others and making those differences explicit by forming new perspectives (Akkerman & Bakker, 2011). Although this might seem similar to identification the focus is different. In identification, the focus lies on a renewed sense of one's current identity, while in reflection the focus lies on using the perspectives of others to form new identities. This gives people working at the boundary the opportunity to learn new things from both their own practices and those of others and with it form new ideas that impact future practice (Akkerman & Bakker, 2011).

When participating in the process of reflection a distinction can be made between two processes namely perspective taking and perspective making (Boland & Tenkasi, 1995). Perspective taking entails being able to appreciate, explicate and use one's own knowledge that is different from the knowledge of others. When a diverse group of team members is competent at perspective taking, this group is capable of utilizing all different perspectives to improve mutual work (Boland & Tenkasi, 1995). In the context of this study, a student who is better at spelling and grammar might for example write down the notes of the meeting, while another might use their talent for leading the meeting.

If a team engages in developing and strengthening its shared knowledge and practices this is perspective making. When this shared perspective strengthens it becomes more complex. This shows a movement from a more undefined naming of things, such as 'This is just how we always do things.' To a situation in which all team members are aware of the shared perspective (Boland & Tenkasi, 1995). An example could be that a learning team develops a shared perspective on the interprofessional problem of collaborating on the same theme with a primary school and a childcare organization.

The current study will look at the development of the skill of reflection of future professionals in interprofessional learning teams. Reflection becomes a boundary crossing competency when one can look differently at his position, because of the position of others (perspective taking) and also able to participate in the development of a shared perspective (perspective making) (Akkerman & Bruining, 2016; Boland & Tenkasi, 1995).

### **2.3.4 Transformation**

Transformation refers to the process of change becoming visible because either practice changes, or new bridging practices evolve out of the collaboration (Akkerman & Bakker,

2011; Akkerman & Bruining, 2016). Transformation can lead to profound changes in practices and is the final learning mechanism of the boundary crossing model.

An important characteristic of transformation is the initial confrontation that causes the need for change. An example of such a confrontation is when during interprofessional collaboration professionals would discover that in all of their practices different sets of rules are used, while this confuses the children who visit all of their separate organizations. Team members need to recognize a shared problem and create a new, hybrid collaboration to solve this problem. To reach transformation new ideas and tools have to be developed, even though there is still some maintenance of the original practices (Akkerman & Bruining, 2016). Boundary crossing competence is supported when an organization is open to transformation (Walker & Nocon, 2007). It is important to notice that transformation is not easily reached because it requires participants to genuinely explore each other's thought worlds (Akkerman et al., 2006).

From an individual perspective, a person participates in the process of transformation when he is confronted with a shared problem, endeavours it collaboratively, and becomes part of the changed practise (Akkerman & Bruining, 2016). An individual has mastered the boundary crossing competency of transformation when he can develop a hybridized position in which his former ways of thinking, feeling, doing and communicating are integrated with those of the others. The unique perspective is maintained but is integrated in a new practice.

## 2.4 THE ROLE OF OBJECTS

Even though the use of boundary objects was already mentioned in the explanation of coordination, it is important to note that Bronkhorst et al. (2020) explain that objects might not solely play a role in the process of coordination. Objects are also mentioned as important during the process of identification, reflection and transformation. An important distinguishment between objects is whether the object is something that a group of people is working 'on' or working 'with' (Bronkhorst et al., 2020).

When an object is used during collaboration by all involved parties and does not have to change to be usable during collaboration it is called a 'boundary object' (Akkerman & Bakker, 2011; Bronkhorst et al., 2020). This was earlier mentioned as means that is used during the mechanism of coordination to help collaboration run smoothly. For example in this research 'e-mail' is a boundary object, since all involved parties are expected to be able to use this object, without changing it.

When the object is subject to change and the goal of the collaboration is to either change or create the object, it is called a 'shared object' (Bronkhorst et al., 2020). An example of a shared object is a set of rules that are written by an interprofessional learning team to be used by both a primary school and an after-school care organization. When the shared object can be put to use in multiple activity systems, it has contributed to the process of transformation.

Even though Bronkhorst et al. (2020) distinguish between boundary objects and shared objects, it is also pointed out that in either case the objects are dynamic and the distinguishment can not always be made properly. Working with objects in collaboration is an interrelated process and objects are often subject to change.

## 2.5 GOAL OF CURRENT RESEARCH

When K&E started the process of the implementation of interprofessional learning teams, the expectancy was that students would develop boundary competencies when collaborating in such a team. This expectancy was based on the idea that students from different educational backgrounds who collaborate are crossing boundaries. However, K&E has so far not explored whether students were developing boundary competencies after the implementation of the interprofessional learning teams.

This research, therefore, aims to answer the question: In what way do students develop interprofessional collaborative skills when participating in interprofessional learning teams, according to students and supervisors? Attention will be paid to the interprofessional collaborative skills or boundary competencies that students acquire when participating in interprofessional learning teams, but also to the perceived aspects that influence the development of these boundary competencies.

## 3. METHOD

### 3.1 RESEARCH DESIGN

During this research, three interprofessional learning teams from the project of K&E were investigated. The teams were purposely sampled by the coordinators of the project of K&E. Sampling was done on the basis of their willingness to participate. The researcher was brought into contact with team supervisors via these coordinators. The learning team meetings of the students who were members of the teams were observed by the researcher. These members also, participated in focus groups, in which they were invited to share their experiences of participating in the learning teams. Of each team, one supervisor was individually interviewed. Also, documents used and created by all teams were analysed. With this design, a narrative of the development of students' boundary competencies when participating in interprofessional learning teams was created.

### 3.2 RESPONDENTS

Three interprofessional learning teams were selected from the pool of 18 learning teams existing within K&E during schoolyear 2021-2022. All three teams will be described in this section, for an overview see Table 1. Of the participating teams, each had its own specific goal or theme that was worked on in the context of child, care and education.

Supervisors of the interprofessional learning teams are professionals coming from diverse backgrounds in the context of child, care and education. They either come from one of the educational institutions that educate professionals to be, or from one of the practice organizations in their networks. K&E has selected all supervisors from their network based on knowledge and experience in the field. Thus, supervisors are expected to be able to guide the learning process of students (De Ridder. et al., 2020).

Of each learning team that participated in this research 1 supervisor was invited to participate in an individual interview. Since all learning teams of K&E have at least 2 supervisors they could decide amongst themselves who would participate in the interview. This led to three participating supervisors with different backgrounds.



**Table 1**

*Overview of participating interprofessional learning teams*

	Number of members at the end of year	Number of students who joined the focus group meeting	Age range	Theme the team was working on
Team A	3	2	21-23	Supporting organization-wide themes
Team B	4	1	Unknown	Nature and Science education in the school
Team C	3	2	19-22	Language games

### 3.2.1 Team A

Team A opened the year with five students and had three students remaining at the end of the year with ages ranging from 21 to 23. Students had the following educational backgrounds: management in pedagogy and educational assistant. The theme this team was working on was: ‘supporting organization-wide themes.’ An example of such a theme was to be supportive to an overarching project about ‘Countries All Over the World’ that was rolled out throughout the entire organization which was an *Integraal Kind Centrum* (Integrated Child Centre, from now on IKC). This project therefore, not only reached children in school but also, in after-school care.

The participating supervisor of Team A has been educating students to work interprofessionally for 12 years. Their current function, next to supervising an interprofessional learning team, is that of a teacher at a vocational school, where they both teach and individually guide students.

### 3.2.2 Team B

Team B consisted of 4 students with an unknown age range. The age of the single student present during the focus group meeting was 19 years old and they were not aware of the age of the other team members. Students had the following educational backgrounds: teacher

training and educational assistant. The theme this team was working on was to collect the needs of children and teachers regarding ‘Nature and Science Education in the School’.

The participating supervisor of Team B teaches at a vocational school and has worked in childcare before becoming a teacher. Team B is the first interprofessional learning team they have guided and this also applies to the other supervisors of Team B.

### **3.2.3 Team C**

Team C opened the year with seven students and had three students remaining at the end of the year. Ages ranged from 19 to 22. Students had the following educational backgrounds: teacher training, educational assistant and childcare employee. The theme this team was working on was: ‘Language Games’.

The participating supervisor of Team C has been working in primary education for 15 years. Their function, next to supervising an interprofessional learning team is co-managing an IKC and guiding interns within this organization.

## **3.3 PROCEDURE & INSTRUMENTATION**

In order to answer the main research question on how students develop boundary competencies when participating in interprofessional learning teams instruments were developed based on the four boundary competencies as defined by Akkerman and Bruining (2016): identification, coordination, reflection and transformation.

For each case, the same procedure was generally followed, depending on the specific situation in each interprofessional learning team. This description will focus on the general procedure for each interprofessional learning team and clarify the instruments that were used. When exceptions occurred these were noted by the researcher. During focus group meetings and individual interviews, audio was recorded.

Before data collection started ethical approval was given by the Ethics Committee BMS at the University of Twente (application number: 220092). Participants gave permission via an informed consent form before participating in this study. Participants could withdraw from the study at any given moment. Names used in this paper were all pseudonymised and references to participants were made gender-neutral to ensure the anonymity of participants.

### **3.3.1 Initial visit**

The first step was a visit from the researcher. She made her acquaintance with members of the learning team and took the time to explain the research and her role in it. She stayed present

during the meeting of the interprofessional learning team. The first goal of this visit was to win over the trust of participants and have an eye for the social aspect of the research (Goossens, 2008). The second goal was to observe behaviour that students and supervisors expressed during a meeting and to take field notes.

### 3.3.2 Focus group meetings

The second step was a focus group meeting organised by the researcher. All students from a team were invited to join this meeting. Students were invited to share thoughts and feelings about their development during participation in the team. During this focus group meeting, the supervisor was not present.

Focus groups are a specific type of group interview (Kraus, 2018) and generate data from a group of people as a whole. Participants respond to both the researcher and each other. This way of data collection appeared most appropriate since the goal was to explore the boundary competencies that students have developed collaboratively. Focus group meetings were led by the researcher, who tried to evoke a lively discussion and encouraged students to share learning experiences as was advised by Kraus (2018).

To provide structure, the focus group meeting was divided into two parts. The first part resembled a structured interview and had several rather broad questions about students' own experiences and opinions on their participation in the team. For example: *Did you, in your own opinion, become better at collaborating because you participated in this team?*

The second part of the focus group meeting consisted of eight statements, based on the Multilevel Boundary Crossing Framework (Akkerman & Bruining, 2016), two statements for each category. Participants were asked to score their team on this statement on a scale of 1 to 10. This scale was chosen to resemble the grading system of the Netherlands in order to make it easily usable for the participants. An example of a statement based on the category 'coordination': *In this team, we collaborate effectively, and little time is wasted.* After participants scored a statement, the researcher asked them to elaborate on their choice and also asked follow up questions, for example, to compare the differences in scores that were given by the students. This way, the use of a grading scale served to evoke a lively discussion. An example of a follow-up question: *Could you explain how you came to your grade?* For all questions and statements used during the focus group meetings, in Dutch, see Appendix A.

### 3.3.3 Interview with supervisor

Following the thought that the professional background of the supervisors might help to see different aspects of the learning process of students, for each team, one supervisor was invited to participate in a structured interview. This interview had 5 questions on the personal experiences of the supervisor and their thoughts about characteristics of students and contexts that might be related to the development of students. For example: *Could you tell me something about the goal of this learning team?* And 13 questions based on the nuances of the categories of the Multilevel Boundary Crossing Framework (Akkerman & Bruining, 2016). For example a question on the category coordination: *To what extent do students spend time trying to organise the team? Are there any routines?* For the complete interview, in Dutch, see Appendix B.

## 3.4 QUALITY STANDARDS

In this section the framework created by Poortman and Schildkamp (2012) was used to explain the steps that were taken to assure the quality of the current research.

### 3.4.1 Controllability and Objectivity

To fulfil the condition of controllability all instruments used during the study were made publicly available (see appendices A, B and C). The procedures and instruments employed to collect data were thoroughly explained to ensure falsifiability and replicability (see chapter 3.3). Transcripts were anonymized for ethical reasons. To keep the research transparent, a second document with the non-anonymous data was kept available.

The researcher has strived to reach objectivity by not only collecting the opinions of participants, but also observing participants and reading documents used and created by participants during their collaboration. In chapter 4 thick description was utilised to describe as completely as possible the research and interpretation steps of the researcher.

### 3.4.2 Reliability

In order to meet the condition of reliability, data collection was based on a study design which was closely connected to the research questions. Separate designs were used for students and supervisors, however, students and supervisors of all three teams were approached in the same manner. This design ensured that all participants were approached the same way in relation to the research questions. Audio recordings and analyses software were used to avoid errors and to analyse data as consistently as possible. Finally, 10% of the data was next to the researcher, also rated by another educational scientist. After the first round, no acceptable inter-rater

reliability was reached yet. After the second round the percentage of inter-rated reliability was calculated at 74%, which in most literature is considered acceptable. Based on the reached consensus among the researchers, the codebook was refined.

### 3.4.3 Validity

Construct validity was enhanced by basing the research on the theoretical model of boundary competencies that was retrieved from the Multilevel Boundary Crossing Framework (Akkerman & Bruining, 2016). A pilot interview was held by the researcher in order to practice interview skills and make corrections to the instrument. Triangulation was applied by making use of multiple sources of data: observations, focus groups, interviews and documents. A chain of evidence was supplied by retaining raw data, and coding focus groups, interviews and field notes. These multiple sources were used to cross-check findings. Finally, this research strived for external validity by thick description and describing conformity or deviation from prior theories. This allows researchers to assess to what extent found results of this study apply in different contexts, therefore, analytical generalisability is applicable (Poortman & Schildkamp, 2012).

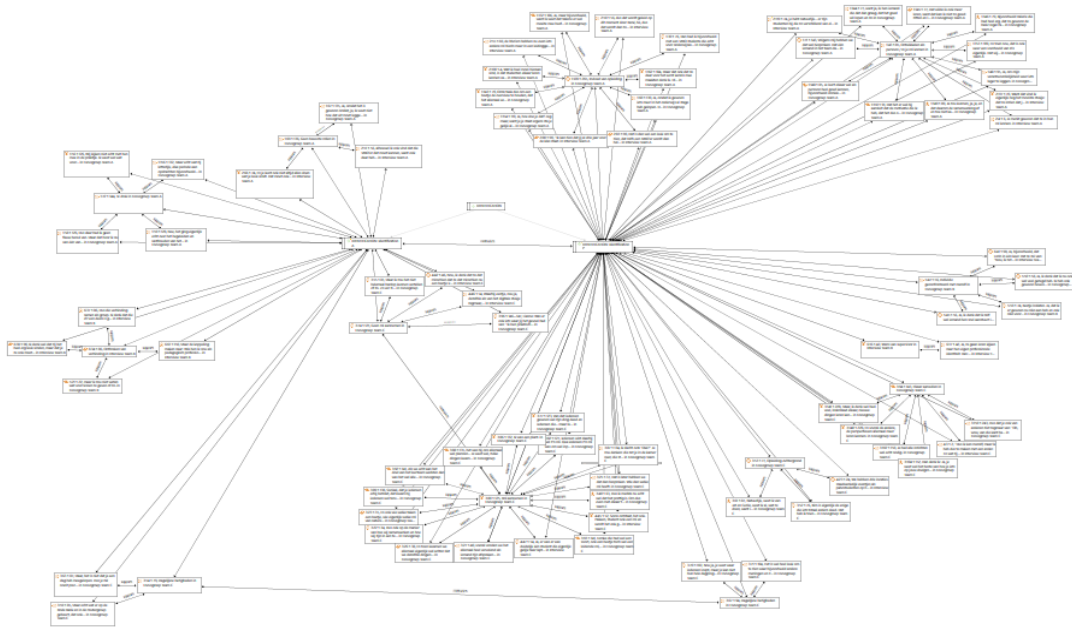
## 3.5 DATA ANALYSIS

Recordings of focus groups and interviews were transcribed. After the interviews had been transcribed and anonymized, answers were analysed by means of a mix of deductive coding and open coding. Also, field notes were coded. Coding was done using ATLAS.ti.

Data were coded by means of a deductive codebook. This was based on the categories of the Multilevel Boundary Crossing Framework (Akkerman & Bruining, 2016). For example, the code “Boundary Object”, was used when a participant described a situation where e-mail was used. Also, open coding was applied whenever interesting answers were given that did not necessarily fit into the framework. An example of this is the code “Educational Background”, which was used when students talked about their personal educational backgrounds. See Appendix C for the complete codebook. After coding the data, visual networks were created in order to find overarching themes, that might help answer the research questions. In order to clarify the use of visual networks an (for ethical reasons made unreadable) example was added in Figure 1.

**Figure 1**

*Example of a visual network*



*Note.* This network shows all quotes that were coded in the category of 'Identification'. Themes were found by clustering quotes that resembled. In this figure quotes were made unreadable for ethical reasons.

## **4. RESULTS**

Due to potentially sensitive information that could be associated with individual respondents, the results chapter of this study is not included in the public version of this report.

## 5. CONCLUSION AND DISCUSSION

This study aimed to explore the development of boundary competencies of students who participated in an interprofessional learning team of K&E. The research, therefore, focused on the question: *In what way do students develop interprofessional collaborative skills when participating in interprofessional learning teams, according to students and supervisors?*

### 5.1 WHICH INTERPROFESSIONAL COLLABORATIVE SKILLS DID STUDENTS DEVELOP, AND TO WHAT EXTENT, WHEN PARTICIPATING IN INTERPROFESSIONAL LEARNING TEAMS?

The first step of the analysis was to explore which boundary competencies were developed to what extent by students who participated in interprofessional learning teams. To answer this question the Multilevel Boundary Crossing Framework (Akkerman & Bruining, 2016) was used as a basis. This framework considers learning broadly as developing new knowledge and skills, as triggered by collaborating with others across multiple different practices. None of the boundary competencies (Akkerman & Bruining, 2016; Akkerman & Bakker, 2011) was fully mastered by members of one of the teams. When directly asked about the development of boundary competencies identification, coordination, reflection and transformation none of the participants responded fully affirmative.

Nonetheless, during the discussions and conversations that were held during this research development of identification, coordination and reflection became apparent in certain cases. Considerable differences were detectable between the perceptions of the three teams.

#### 5.1.1 Development of boundary competency identification

Participating students seem to have partly developed the boundary competency identification. This was done in two ways: recognizing the influence of their educational background and being confronted with their personal characteristics. Despite this development, there was little conscious role-taking done by students.

The presence of recognizing identities and the absence of role-taking can be connected to the two processes of identification that Akkerman and Bakker (2011) distinguished. Recognising how one's identity differs from that of the others was defined as 'othering'. This is considered present in both the students of Team A and C. The second process that Akkerman and Bakker (2011) defined is the need for 'legitimizing coexistence'. This translates into considering the



new role that each individual has to take in an interprofessional context. Participating students did not seem to be consciously legitimating coexistence.

A possible explanation for the lack of legitimating coexistence by students is that explicit role-taking is often caused by feelings of threat when a professional needs to find a new role (Akkerman & Bakker, 2011; Timmons & Tanner, 2004). For example when a new job is created that threatens a former position. Participants in this study were not yet professionals. The educational background of participating students might not be as embedded in their identity yet as that of professionals. Therefore participation in an interprofessional learning team of K&E might not cause the need for legitimating coexistence.

In conclusion, students of Teams A and C seem to have developed the boundary competency of identification partly. In Team B this boundary competency does not seem to be developed by the participating students.

#### **5.1.2 Development of boundary competency coordination**

Coordination seems to be partly developed by participating students. Even though students in all teams mentioned a degree of frustration with how some matters were organised, efficient use of shared objects and other components of coordination can be recognised in the different teams.

A found component of the boundary competency of coordination is the level of routinization that students collaboratively developed when participating in a learning team. In both Teams A and C routines were developed. The development of routines is mentioned by Akkerman & Bakker (2011) as important to be able to cross boundaries increasingly effortless and automated. Therefore routines help to normalize the crossing of boundaries and thus contribute to the development of the boundary competency of coordination.

How students developed the boundary competency of coordination seems to be closely related to the level of guidance that was given by supervisors. A distinct difference was found between the guidance in Team B, where the supervisor kept a directive role, and in Team A and C, where guidance faded out and students gradually received more responsibility. Fading out supervision can be linked to the concept of 'scaffolding', the deliberate fading out of supervision based on the level of students, where responsibility is gradually transferred from the supervisor to the students (Van de Pol et al., 2010).

In conclusion, in Team C, the boundary competency coordination seems to be developed by the students to the furthest extent, followed by Team A where it was developed partly and Team B where it does not seem to be developed at all by students. Routines, boundary objects, shared objects and the fading out of supervision seem to have contributed to the development of the boundary competency coordination of students.

### **5.1.3 Development of boundary competency reflection**

Different components of the boundary competency reflection were developed by participating students in this study. However, considerable differences were found between the three teams.

In Team A the boundary competency of reflection seems to be developed to a small degree by participating students. It was only clearly recognizable in one case. In this case, the students took a new perspective on their educational background. In Team B the boundary competency of reflection also was only recognized in one case, where the participating student changed their perspective on participating in the interprofessional learning team. This renewal of perspectives in the light of others is defined as ‘perspective taking’ (Boland & Tenkasi, 1995) and is considered to be one of the two vital parts of the boundary competency of reflection.

In Team C considerably more cases of development of the boundary competency of reflection were observed. Team A and B differed from Team C in the respect that in Team C a new shared perspective was developed as opposed to new individual perspectives. Collaboratively creating a new perspective, ‘perspective making’, is the second vital part of the boundary competency of reflection (Boland & Tenkasi, 1995).

In none of the three teams, both perspective taking and perspective making were observed, which leads to the conclusion that in none of the teams the boundary competency of reflection was fully developed.

### **5.1.4 Development of boundary competency transformation**

In none of the three teams, students have developed the boundary competency transformation. This can be concluded since no indications of hybridized positions were mentioned or observed. The lack of development of a hybridized position in students can be explained by the fact that none of the teams has faced a confrontation that was strong enough to experience the need to develop a hybridized position (Akkerman & Bakker, 2011).

Even though Team A was confronted with a shared problem between organizations, this confrontation did not lead to the development of the boundary crossing competency

transformation. An explanation for this could be, that this confrontation did not pose a real problem for the students themselves. It merely awakened a form of curiosity on how certain things are organised in the context of child, care and education.

Despite the lack of development of a hybridized position, students of Team A and C did create shared objects that can be seen as first steps in in-between practices. Akkerman and Bakker (2011) mentioned creating in-between practices as a part of the mechanism of transformation. However, there is a risk of these objects becoming a tool that is solely used in separate practices and no longer jointly worked on by all parties involved (Edwards & Mutton, 2007). In the case of Team A, this risk is important to keep in mind, since the students who created these objects leave at the end of the year. In the case of Team C this risk is smaller, since the new interprofessional learning team will continue working on the products that Team C has developed.

When concluding that participating students did not develop the boundary competency of transformation it is important to notice that this is rarely realised amongst professionals who collaborate interprofessionally (Akkerman & Bakker, 2011). A possible explanation for this is that historically speaking activity systems did not collaborate. It is complex to transform practices into new shared activity systems (Engeström, 2001). Participants in interprofessional learning teams in this study, are students and not yet professionals. This implies that they do not yet have a fully developed professional identity that they can transform.

## 5.2 WHICH CHARACTERISTICS OF STUDENTS AND CONTEXTS ARE PERCEIVED TO BE RELATED TO THE DEVELOPMENT OF THE INTERPROFESSIONAL COLLABORATIVE SKILLS OF STUDENTS WHEN PARTICIPATING IN INTERPROFESSIONAL LEARNING TEAMS?

This study also explored which characteristics of students and contexts were perceived by participating students and supervisors to be related to the development of the students' boundary competencies when participating in interprofessional learning teams. Characteristics found in this study were openly coded. After analyses of the data, all discovered characteristics were recognised as individual and organizational factors at the micro and meso level of the conceptual model of professional learning networks (Poortman et al., 2021). Professional learning networks that served as the basis to create this model were focused on

contributing to the broad development of children, similar to interprofessional learning teams in this study.

### **5.2.1 Perceived influencing characteristics at the micro level**

At the micro level perceived characteristics to influence the development of boundary competencies of students were: attitudes and motivation. According to Prenger et al. (2017), participant attitudes and motivation towards the goal of the learning team influence the learning of participants. In the current study, this was seen both in the positive and negative direction, where students who mentioned a positive attitude and motivation seemed to have developed boundary competencies to a further extent than students who did not feel motivated or have a positive attitude towards participating in the interprofessional learning team.

### **5.2.2 Perceived influencing characteristics at the meso level**

At the meso level of the conceptual model of professional learning networks, three different facets that influence learning in professional learning networks were mentioned: size and composition, leadership, and context of the organization (Poortman et al., 2021).

Firstly size and composition were both perceived as characteristics influencing the development of boundary competencies by participants of this study. The size of the learning teams was mentioned as being too small to ensure continuity in the collaboration. Also, the fact that students came from different educational backgrounds with different agendas made collaboration vulnerable according to participants.

Secondly, leadership came forward in this study in the form of differences in guidance that was given by supervisors, specifically, differences were found in the level of scaffolding that supervisors employed. Ouyang et al. (2022) concluded that scaffolding supervision in a group of teachers in training had positive effects on the students engaging in idea exchanges and better regulation and reflection of collective knowledge building. These findings confirm the positive experiences that students in Team A and C had, while their supervisors deliberately scaffolded guidance.

Another influence of leadership of supervisors seemed to be the attention that was paid to organising activities that were specifically meant to enhance the development of boundary competencies. Structured use of purposeful activities in learning teams can lead to higher learning outcomes (Prenger et al., 2019). The more structure supervisors used in their leadership style and the clearer their goals were for the students in the teams, the more boundary competencies seem to have been developed by students in the teams.

Thirdly, perceived characteristics that can be connected to the context of the organization of the learning teams are the way communication was organised and the frequency of meetings. Both of these characteristics are a part of the facilitation of learning in an interprofessional learning team. Zuiker et al. (2017) mention the importance of communication and continuity, but also of meta-communication in learning communities. In the case of the interprofessional learning teams, it seemed that ways of communication were not always clearly outlined and that this might have hampered the development of boundary competencies of students.

### 5.3 CONCLUSION

In conclusion, the way that students developed interprofessional collaborative skills when participating in interprofessional learning teams of K&E according to students and supervisors, is a complex and integrated process that has been set out differently for all participating teams. In general, this research has shown that the frequency in which these boundary competencies were developed by students in the teams was variable. The boundary competency that seems to have been developed to the highest degree was identification, followed by coordination and reflection. The competency transformation was not developed by students at all.

In Team A and C students partly developed the boundary competencies of identification, coordination and reflection. In Team B, only a little amount of cases where any boundary competencies were developed were mentioned or observed. Influencing characteristics of students and contexts were found at the micro and meso level and seem to both have had a positive and negative impact on the development of boundary competencies of students who participated in an interprofessional learning team of K&E.

### 5.4 PRACTICAL IMPLICATIONS

The current study brought to light results that might be of value in the practice of K&E when implementing interprofessional learning teams of students in organizations in the context of child, care and education.

At first, K&E is advised to assess which of the four interprofessional boundary competencies identification, coordination, reflection and transformation are to be developed by students who participate in their interprofessional learning teams. For it might not be desirable that participating students develop all boundary competencies. Akkerman and Bruining (2016) explained that not all boundary competencies are always equally important. The importance of each competency is dependent on the context the collaboration takes place. In the case of

the interprofessional learning teams of K&E the development of the boundary competency of transformation, might not be needed. Since students are not yet professionals and might not have a fully developed professional identity yet to transform.

The advice is to focus the meetings on the development of the boundary competencies identification, coordination and reflection. Supervisors can do this by using structured activities for students during the team meetings in which these three boundary competencies form the learning goals. An example of such an activity is the visiting of the different places that the students do their internships at. As was done in Team C. The goal of this activity would be to make students aware of the idea that where others come from, influences how these others perceive their work. This would form a sub-goal of the larger goal of developing the boundary competency identification.

Also, this study appears to have revealed a substantial impact of the way interprofessional learning teams were supervised on the development of boundary competencies of students. It came forward that no specific preparation was given to new supervisors. The use of scaffolding, clear goals and structure by supervisors seems to have a positive impact on the development of boundary competencies of students (Prenger et al., 2019; Van de Pol et al., 2010).

The practical implication of this is the advice to train (starting) supervisors on these specific aspects of leadership when preparing them to become supervisors of an interprofessional learning team. During this training, supervisors could also learn about how to implement the activities that are specifically meant to teach students boundary competencies. By training the supervisors of all teams K&E could create an overarching way of working which could help the supervisors be more goal-oriented and create more unity between all of the teams.

Furthermore, the way students and supervisors communicated outside of the time that the interprofessional learning teams spent together seemed to influence how motivated students were to participate and therefore how their development of boundary competencies turned out. Zuiker et al. (2017) explained that for participants to feel connected to an interprofessional collaboration clear agreements must be established on how communication takes place. This forms a condition for the collaboration to work well. In the case of the interprofessional learning teams, the advice is to stay close to the way students are used to communicating to make communication run smoothly.

The final practical implication that this study has brought up is the advice to start rewarding students for their participation in an interprofessional learning team. Several participants in this study have spoken about how the lack of reward for participation negatively influenced their motivation to commit to the team. Participation in an interprofessional learning team takes time from students which they do use to develop themselves in the context of child, care and education, which is part of their studies. Therefore they should be rewarded in the form of credits. This is also likely to increase their motivation for committing to the team and with that, the expectancy is an increase in the development of interprofessional boundary competencies.

## 5.5 LIMITATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

A limitation to the current research is the small sample size of three participating interprofessional learning teams. Also, the participating teams were not chosen at random but, brought forward by coordinators of the project of K&E. Since this study had a small non-random sample and not all participants of the teams participated in the study no generalisations can be made to other contexts about students in interprofessional learning teams. In this study, all participating students worked in the context of the project of K&E.

Future research should therefore investigate whether or not the same results would come forward when interprofessional learning teams of students collaborate in different contexts. Attention should be paid to the generalisability of the results by choosing participants at random. The advice, therefore, is to carry out cluster sampling when researching the development of boundary competencies of students in interprofessional learning teams.

This study furthermore showed how the intrapersonal learning mechanisms of the Multilevel Boundary Crossing Framework (Akkerman & Bruining, 2016) can be seen as interprofessional boundary competencies. Therefore in future research on interprofessional collaboration these boundary crossing competencies can be used as a base to measure individual development during this collaboration. When the participants of the research consist out of students, the advice is to leave out the mechanism of transformation.

The outcomes of this research could be used as a starting point for follow-up quantitative research on the question of which boundary competencies students in interprofessional learning teams develop and to what extent. Using the instruments and results of this research the next step could be the development of a survey that, for example with the use of a ordinal scale, measures the individual level of the boundary competencies identification, coordination

and reflection. Different versions of this survey could be filled in before, during and after participating to an interprofessional learning team to create an image of the development of the student over time.

Finally, a start was made with this study to discover the development of students in interprofessional learning teams. However, it might be the case that their educational background does not mean the same to them as professions might mean to the identity of professionals. Therefore the development of boundary competencies might work differently for students than for professionals. More research, specifically on the topic of the development of interprofessional boundary competencies amongst students, therefore, is needed.



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## APPENDIX A – FOCUS GROUP

### Vragen - deel 1

1. Zou je kunnen vertellen waarom jullie als leerteam bestaan? Wat is jullie doel?
  - a. De vorige keer heb ik gezien dat jullie bezig zijn met het thema... Zouden jullie me hier iets meer over kunnen vertellen?
  - b. Hoe doen jullie dat/ hoe werk je hieraan?
2. Wat doen jullie in de samenwerking om aan jullie thema ... zo goed mogelijk te werken?
  - a. OF Ik heb jullie vorige keer dit zien doen... doen jullie dit vaker? Hoe zorgt jullie samenwerking ervoor dat jullie thema/doel behaald wordt?
3. Ben jij door mee te doen met dit leerteam beter geworden in samenwerken denk je?
  - a. Welke dingen weet je nu die je voordat je meedeed nog niet wist?
  - b. Wat kun je nu wat je eerder nog niet kon op het gebied van samenwerken?

Mogelijke follow up vragen:

- Kun je daar iets meer over vertellen?
- Kun je daar een voorbeeld van geven?

### Stellingen – deel 2

#### Uitleg:

Ik geef steeds een omschrijving van een vaardigheid die te maken heeft met interprofessioneel samenwerken. Jullie krijgen van mij allemaal het herkenbare wisbordje. Als jij het 100% met de stelling eens ben dan geef je een tien. Ben je het maar deels met de stelling eens dan geef je een 5 en helemaal niet dan geef je een 1.

#### Identificatie

Stelling:

1. Ik weet wat de anderen in dit teams tijdens hun dagelijkse werk doen.
2. In dit team kent iedereen zijn rol.

Mogelijke follow-up-Mogelijke follow-up-vragen:

- Kun je uitleggen waarom je dat cijfer hebt gegeven?
- Wat zou je kunnen vertellen over het werk van de anderen?

- Wat is jouw rol in dit team?
- Wat zou je kunnen vertellen over de rol van de anderen?

### **Coördinatie**

Stelling:

1. In dit team worden dingen snel geregeld.
2. In dit team werken we (effectief) goed samen, er gaat weinig tijd verloren.

Mogelijke follow-up-vragen:

- Kun je uitleggen waarom je dat cijfer hebt gegeven?
- Hoe zorgen jullie ervoor dat de samenwerking soepel verloopt?
- Wat kan beter? Hoe zouden jullie ervoor kunnen zorgen dat jullie dit gaan bereiken?

### **Reflectie**

Stelling:

1. In dit team leren we (nieuwe dingen) van elkaar.
2. Doordat ik in dit team zit, ben ik anders naar mezelf en mijn studie/stage gaan kijken.

Mogelijke follow-up-vragen:

- Kun je uitleggen waarom je dat cijfer hebt gegeven?
- Zou je iets kunnen vertellen over de invloed dit de anderen hebben gehad op jou?
- Denk je dat op deze manieren samenwerken jou helpt om je stage in een ander perspectief te zien? Waarom wel of niet?

### **Transformatie**

Stelling:

1. Door mee te doen met dit team, kijk ik anders aan tegen mijn eigen stage.
2. Deelnemen aan dit team heeft mij beïnvloed in hoe ik over dingen denk.

Mogelijke follow-up-vragen:

- Kun je uitleggen waarom je dat cijfer hebt gegeven?
- Kun je een voorbeeld noemen van iets van een ander, wat jou nu nog beïnvloed? (evt. voorbeelden geven: een verhaal, een manier van denken etc.)

## APPENDIX B – INTERVIEW SUPERVISOR

1. Kun je iets vertellen over je ervaring met en het doel van dit leerteam?
2. Hoe vind je het om begeleider te zijn van dit interprofessionele leerteam?  
(Wat is leuk, wat is moeilijk?)
3. Kun je vertellen hoe je bent voorbereid op het begeleiden van dit leerteam?
4. Denk jij dat het deelnemen aan een interprofessioneel leerteam waardevol is voor de ontwikkeling van studenten? Waarom wel of waarom niet?
  - Wat voor nieuwe kennis doen studenten op?
  - Wat voor nieuwe vaardigheden doen studenten op?
5. Welke aspecten zijn volgens jou van invloed op het leerproces van studenten in een leerteam?  
Evt voorbeelden: *Dan heb ik het bijvoorbeeld over praktische zaken, maar ook achtergrond van de student en groepsdynamiek.*

### Coördinatie

6. Wat voor middelen zetten studenten in om op een soepele manier samen te werken?  
*Voorbeelden zijn: gedeelde agenda's, maar ook dezelfde formulieren, of methode etc.*
7. Zijn de middelen die gebruikt worden voor iedereen even bruikbaar? Waarom wel of waarom niet?
8. In hoeverre gaat er veel tijd zitten in organisatie of is er al een bepaalde routine ontstaan? Zou je dit kunnen uitleggen met een voorbeeld?

### Identificatie

9. Lukt het studenten om zich te identificeren in de groep? Hier bedoel ik mee: Kunnen ze hun eigen achtergrond een plaats geven in de groep ten opzichte van de achtergrond van de anderen? Kun je hier een voorbeeld van geven?
10. In hoeverre lukt het studenten om verschillen te gebruiken of is dit juist iets moeilijks?  
*Evt. voorbeeld: iemand is goed in organiseren en die geeft leiding aan het gesprek.*

### Reflectie

11. Er zijn verschillende studenten met verschillende studieachtergronden, die studenten hebben een bepaald perspectief op het thema.

Lukt het studenten om vanuit dat perspectief te reflecteren op het thema e nook te zien hoe anderen daarin staan?

12. Realiseren studenten zich het verschil tussen hun eigen en het werkveld van de anderen en kunnen ze hierover reflecteren (kunnen ze een nieuw perspectief op zichzelf maken)?
13. Lukt het studenten om met de nieuwe inzichten over zichzelf door de anderen een eigen (nieuwe) mening te vormen (een nieuw perspectief in te nemen)?
14. De studenten komen allemaal uit een andere studierichting, maar ze hebben wel regelmatig met elkaar te maken doordat ze samen in een leerteam zitten. Misschien hebben ze hierdoor wel invloed op elkaars stage in de praktijk.  
Gaan studenten volgens jou andere dingen doen in de praktijk, door de ideeën die ze hier opdoen? *Heb je misschien een voorbeeld?*

### **Transformatie**

15. Zijn de studenten al eens geconfronteerd met een situatie waarin het duidelijk nodig was om interprofessioneel samen te werken? (confrontation) Wat gebeurde er toen?
16. Lukt het studenten om gedeelde problemen te herkennen? (recognizing a shared problem space)
17. Zijn er door de studenten van dit leerteam praktijken ontwikkeld die in gebruik kunnen worden genomen door de verschillende werkvelden? (hybridization+crystalization)
18. Lukt het studenten om elkaar te blijven bevragen op hoe zij iets in hun eigen werkveld zouden aanpakken?



## APPENDIX C – CODEBOOK

Category	Description	Code(s)	Description	Quote	Apply if...
<b>General Information</b>	General information about participants and learning teams.	<b>Age</b>	Age of participant.	"21"	Age is mentioned.
		<b>Educational background</b>	Educational background of participant.	"Pedagogisch management: Kind en Educatie."	Educational background is mentioned.
		<b>Team members</b>	Names, number or characteristics of other team members.	"Dat is ook weer een voorbeeld van l. eigenlijk. Dat wij heel druk bezig waren met dingen afkrijgen. En dan zag je l. eigenlijk achter die laptop met hele andere dingen bezig zijn."	Other (non-present) team members are mentioned.
		<b>Activities</b>	What students do when they are participating in a team.	"Maar soms is het ook gewoon één dag overleggen."	Descriptions of activities are given.
		<b>Grade</b>	Grade that participant gives to a statement, ranging 1 to 10.	"6"	A participant gives a grade to a statement.
		<b>Preparation Supervisor</b>	How supervisors were prepared for the job of 'supervisor	"vanuit de verschillende actielijnen wordt natuurlijk van alles aangeboden	Supervisor mentions activities of preparation for

			interprofession al learning team’.	om te kijken: Wat heb je nodig? Zelf heb ik ook wel in de expertise groep gezeten om eens te kijken naar: Wat is nodig? In de begin-fase. Nou, dat is, dat wordt ook opgepakt. D'r zijn natuurlijk vanuit Kind & Educatie allerlei tools die je kan bekijken en gebruiken, om vooral die proceskant te begeleiden.”	being a supervisor.
<b>Goals</b>	Each learning team has its own specific goal or goals.	<b>Goal</b>	Each learning team has its own specific goal of goals.	“Eigenlijk gaat het om vooral de school helpen, dat wij daar wel iets in organiseren, van dat wij handvaten geven, van lesideeën of activiteiten.”	The goal or goals of the team is mentioned.
<b>Boundary</b>	Sociocultural differences between practices that lead to discontinuities	<b>Boundary Education/ Internship</b>	Differences between education and internship.	“Er is verwarring: Landstede heeft blijkbaar leerteams afgeschaft en daarom dachten L. en T. dat ze	A boundary is faced that is a difference between their education and their internship.

	in action or interaction.			niet hoefden te komen.”	
		<b>Boundary Interprofessional</b>	Differences faced between students, because of different educational backgrounds.	"Oké, R. en ik doen meer de management kant en de rest doet meer de uitvoerende kant".	A boundary is faced that is caused by differences between students, because of different educational backgrounds.
<b>Boundary Crossing</b>	A students actions and interactions across different sites.	<b>Boundary Crossing P</b>	Boundaries are crossed.	“Maar ook wel weer leerzaam. Ja, zeker, want wij hebben hun natuurlijk laten zien van hoe doe je dat en wat komt er allemaal bij kijken. Actielijst, notulen, wat is een taak als voorzitter en notulist dus. Maar, ook andersom van ik wist echt niet hoe je een les voorbereiding moest maken. Ik heb die opleiding niet gevolgd.”	This is explicitly happening, boundary crossing is present.

		<b>Boundary Crossing A</b>	Boundaries are not being crossed.	“Maar dat hebben we dus nooit gedaan, maar dat was wel het idee.”	This is explicitly not happening, is absent, but mentioned by participant.
<b>Objects</b>	Means that help crossing boundaries	<b>Boundary Object P</b>	A thing that helps boundary crossing and is used by the team.	“Notulen, actielijst, planning. Maar ook gewoon echt inhoudelijke lesvoorbereiding en bijvoorbeeld.”	The means itself is mentioned and used. The boundary object is present.
		<b>Boundary Object A</b>	A thing that helps boundary crossing and is not being used by the team.	“maar die konden doordeweeks niet in de mail”	The means itself is mentioned and not used. The boundary object is absent.
<b>Identification</b>	The student is (re)defining the way in which others are different from himself and recognizing how they can legitimately coexist.	<b>Identification P</b>	Students are confronted with different identities of themselves but also with those of the others participating in the interprofessional learning team.	“want dat was echt haar vakgebied, zeg maar en ik was er dan meer om gewoon haar bijvoorbeeld feedback te geven”	Explicitly mentioned as ‘happening’ or ‘happened’ in our team. Also code if: students are ‘taking their role’. Identification is present.
		<b>Identification A</b>	Students are not confronted with different identities of themselves). And also not	“Ik denk dat daar een onderdeel van is dat je de rol van iedereen niet helemaal duidelijk hebt”	Above is mentioned and wanted, but not happening, absent.

			with those of the others participating in the interprofessional learning team.		
<b>Coordination</b>	The student can find means or procedures that help smoothly align his own position to the position of others to ensure that shared activities run smoothly.	<b>Coordination P</b>	Measures and procedures to help collaborate smoothly are applied.	“Dan nemen we door wat we die dag gaan doen, en dan gaan we dat op een gegeven moment doen. Dan gaan de begeleiders weg en dan pakken we dat samen op”	This is going explicitly well. Coordination is present.
		<b>Coordination A</b>	Measures and procedures to help collaborate smoothly are not applied.	“er werden heel veel afspraken gemaakt, bijvoorbeeld voor de volgende dinsdag. En als die dan niet na werden gekomen, moesten die dus weer op de dinsdag opgelost worden. En dat werd de hele tijd zo'n doorlopende cirkel.”	This is going explicitly wrong. Coordination is mentioned, but absent in the team.
<b>Reflection</b>	The student can look differently at his own	<b>Perspective Taking P</b>	The student looks differently at his own	“Want voorheen zag ik dat dan gewoon voor m'n neus gebeuren,	Perspective taking activities are mentioned and were

	position, because of the position of the others. A distinction is made between perspective taking and perspective making.		position, because of the position of the others, the perspective of the student is useful to the group.	maar nu moest ik er zelf wat aan gaan doen”	present in the team.
		<b>Perspective Taking A</b>	The student does not look differently at his own position, because of the position of the others. Individual perspectives do not contribute to the group.	“Ik denk dat ze dat best nog wel moeilijk vinden. Want ze zitten er toch allemaal voor zichzelf. Dus een eigen opleiding, dus wat zij moeten doen, daar ligt wel de focus op.”	Perspective taking activities are mentioned but were absent in the team.
		<b>Perspective Making P</b>	Student participates in development of a shared perspective.	X	Shared perspectives are developed in the team.
		<b>Perspective Making A</b>	Student does not participate in development of a shared perspective.	X	Development of shared perspectives are mentioned but absent in the team.
<b>Transformation</b>	The student can develop a position in which his former ways of thinking,	<b>Confrontation</b>	The student is confronted with a situation in which interprofession	“Want het is ontstaan doordat zij erachter kwamen met de vraag, want ze zouden iets voor	A confrontation is mentioned that students encountered in which

	feeling, doing and communicating are integrated with those of the others.		al collaboration is needed.	het landen-thema zelf gaan doen. Dat ze merkten: Die communicatie is nog niet zo duidelijk.”	interprofession al collaboration is clearly needed.
		<b>Changed Practice</b>	An in-between-practice is developed that can be used by the different fields.	“Ja, producten. Er zijn er natuurlijk vanuit de verschillende thema's lesactiviteiten gedaan. Die les activiteiten, die staan.”	In-between-practice is mentioned that was developed by the team.
		<b>Hybridized position P</b>	Student has developed a position in which his former ways of thinking, feeling, doing and communicating are integrated with those of the others. The unique perspective is maintained, but is integrated it in a new practice.	“Want ik heb wel, ik ben er vooral achtergekomen dat je ook nog, zoals weer over die verschillende invalshoeken. Dat heb ik vooral echt meegenomen. Van: "Oh, ja. Je moet niet alleen maar op je eigen gefixeerd blijven, want er is nog veel meer wat er speelt." Dat heb ik vooral meegenomen.”	Students' position is clearly changed and the ways of others are integrated in this position.
		<b>Hybridized position A</b>	Student has not developed	“Als je op het KDV stage loopt	Students' position is

			a position in which his former ways of thinking, feeling, doing and communicating are integrated with those of the others. The unique perspective is not maintained nor integrated it in a new practice.	en in groep acht. Dan is de afstand wel heel groot.”	mentioned clearly to be unchanged and the ways of others are explicitly not integrated in this position.
<b>Influencing characteristics</b>	Characteristics of students and contexts that are perceived to be related to the development of interprofessional collaborative skills of students.	<b>Characteristic Student+</b>	A characteristic of an individual student that positively influences development of boundary competencies.	“intrinsiek gemotiveerd zijn om te leren”	A student-characteristic that positively influences the learning process of boundary competencies is mentioned.
		<b>Characteristic Student-</b>	A characteristic of an individual student that negatively influences development of boundary competencies.	“geen motivatie meer”	A student-characteristic that negatively influences the learning process of boundary competencies is mentioned.
		<b>Characteristic Context+</b>	A characteristic of the context that positively influences	“Nou, één van de dingen is natuurlijk dat hier gewoon een	A context-characteristic that positively influences the



			development of boundary competencies.	IKC-lab is, dus dat lokaal beschikbaar is voor studenten. Dat ze ook daar vandaan uit kunnen werken en dat is ook lang niet op elke plek hetzelfde zo heb ik gemerkt. Wat ik dan zo om mij heen hoor. Echt gewoon een vaste plek, vaste tijd, vaste dag, dat geeft houvast.”	learning process of boundary competencies is mentioned. Including supervision.
		<b>Characteristic Context-</b>	A characteristic of the context that negatively influences development of boundary competencies.	“In de voorwaardesfeer is het heel vind ik het heel moeilijk om te plannen: "Wanneer komen we bij elkaar?" Ik weet eigenlijk van tevoren al dat, hoe goed gepland ook, dat je nooit alle studenten bij elkaar kunt hebben.”	A context-characteristic that negatively influences the learning process of boundary competencies is mentioned. Including (lack of or too much) supervision.

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