General discussion

‘A perfect concept doesn’t mean nothing can be added; it means nothing about it is superfluous.’

After Antoine de Saint-Exupéry
The aim of this thesis was to enhance the understanding of what motivates healthcare students for interprofessional education (IPE). Motivation for interprofessional learning (IPL) is important, because it helps students to answer their question ‘Why learn?’ (ten Cate et al, 2004). Furthermore, motivated students are more likely to incorporate interprofessional working into their value system (Ryan & Deci, 2000). This in turn will enhance the likelihood of interprofessional collaboration (IPC) throughout their working life and under diverse circumstances. This thesis assesses factors that can enhance or reduce the motivation of students for IPE, in classroom settings, and in the setting of a hospital ward (see Table 1).

In this general discussion, the main findings of the thesis are structured under specific IPE characteristics and related to the literature, to highlight aspects for IPE development and evaluation. The IPE characteristics are followed by implications of the research and a valorisation of the findings.

A literature review was performed to obtain a better understanding of the factors that facilitate interprofessional learning and factors that form a barrier to the learning of medical and nursing students involved in IPE with students from other professions. We could distinguish three levels at which the students’ perceptions became clear: cultural or organisational level, process or curriculum level, and individual level. It also became apparent that most of the perceptions studied in the literature were at the cultural and curricular level, with very few studies exploring perceptions at the individual level (chapter 2).

Another category in the findings of the literature review was ‘readiness for IPL’, a concept introduced a decade ago (Parsell & Bligh, 1999). In a quantitative study, we explored how this concept could be associated with well-known concepts in medical education by means of a survey among the medical students in all 6 years of our school. After investigating the perceptions of students regarding IPL in the literature and among our medical students, we took the opportunity to perform our qualitative research of interprofessional education on two wards. CAIPE refers to the practice setting as ‘interprofessional practice learning – IPPL’ (CAIPE, 2015). In both initiatives the patients were carefully selected and the student team was in the lead, albeit under close supervision.

We report the findings in this thesis under the following seven characteristics of IPE: authentic learning situations, group dynamics, readiness to see more perspectives, autonomy-supportive learning environments, immersion, involving the professionals, and structuring clinical reasoning. These IPE characteristics each play an important role in motivating students for IPE, either directly or via their apparent effect on the students’ supervisors.

**IPE characteristic 1: Authentic learning situations**

In the 65 papers in the literature review (chapter 2), authentic learning situations were considered strong facilitators of IPE. These situations are characterised by the introduction of a real patient, either on paper (case study) or on an IPE ward, and the students have to solve a problem that is perceived to be close enough to the work reality and the demands of the profession.

Real patient situations lend urgency to students’ decision-making process. Urgency of patient care has been identified as a key facilitator of collaboration between residents and nurses (McGrail et al, 2009). Applying the principles of Learning-Oriented Teaching (LOT) (ten Cate et al, 2004) to IPE initiatives, the authenticity of learning situations clearly provides students with an unequivocal answer to the question ‘Why learn?’.
Table 1. Main findings from the literature review in chapter 2 (in italic), supplemented by findings from the studies in chapters 3, 4, and 5.

<table>
<thead>
<tr>
<th>Level</th>
<th>Readiness for IPE</th>
<th>Facilitators of IPE</th>
<th>Barriers to IPE</th>
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</table>
| Cultural or organisational | • Urgency of interactions  
• Lack of interactions                    | • Informal contact  
• Getting acquainted  
• Positive attitudes towards IPE maintained after graduation | • Belonging to a social group  
• Miscommunication caused by communication style  
• Experience in healthcare practice  
• Gaps in perception of roles of others |
| Process or curricular      | • Readiness fluctuates during years in school                                    | • Integration of IPE and professional learning goals  
• Immersion in IPE or IPC; exposure to IP teams  
• Authentic learning situations  
• Teamwork enhanced by teacher  
• Training in Team Communication  
• Teacher facilitating reflection  
• Feeling of choice (autonomy) – student experiences an autonomy-supportive learning environment  
• Structure in the interprofessional patient care meeting  
• Seeing the professional perspective (clinical reasoning) of other professions  
• Room for student team on the IPE ward | • Non-integrated IPE and profession-specific learning goals  
• Assessment of all but the IPE learning goals |
| Individual                 | • Gender (higher in females)  
• Age and phase of study (younger students higher)  
• Stereotyped views  
• Work experience  
• Cognitive component of empathy, i.e. | • Being near (e.g. same ward) and conveyance of trust, respect, and interest in collaboration  
• Own role clarity  
• Relatedness with peers, teachers  
• Feeling competence | • Unprofessional behaviour by others or when others prioritise their profession-specific learning goals over IPC  
• Stereotyped views |
‘Taking the perspective of the patient’ and autonomous motivation *

- Being female and in the first year of medical school **

- Valuing IPE

* Explained 15.7% of the variance in subscale ‘Teamwork and Collaboration’ of the Readiness for Interprofessional Learning Scale (RIPLS).

** Explained 14.3% of the variance in the combined RIPLS subscales ‘Negative and Positive Professional Identity’ (about shared learning).
Similarly, both IPE wards offered an authentic learning situation for the supervisors. In their interviews, the supervisors indicated that observing their peers had helped them to appreciate how IPE enhanced their own skills and attitudes, clarifying their professional responsibilities and underlining the importance of interprofessional communication. The effect of the IPE ward on supervisors could be evaluated at Kirkpatrick level 3: they self-reported an improvement in their collaboration with supervisors from other professions (Barr, 2002).

**IPE characteristic 2: Stimulating positive group dynamics**

In the literature, IPE has been viewed from the perspective of various social theories; among these, Intergroup Contact Theory (Pettigrew, 1998a) differentiates between the ‘in-group’, in which most interactions take place, and the ‘out-group’, which is unfamiliar. When students were stimulated to get to know each other, by relating to one student from an ‘out-group’ they gradually learned a great deal more about it. At the cultural level, being unfamiliar with other professions and having stereotypical views of them stood in the way of IPE. ‘Work experience in healthcare’ could work either as a barrier or as a facilitator. In a cross-sectional study, attitude towards healthcare teams was significantly poorer among students (nursing, physical therapy, occupational therapy, laboratory sciences) who had completed their graduation (about a year after graduation) in comparison with third-year students after undertaking the same IPE training (Makino, 2013). In a longitudinal study, work experience was a facilitator when students graduated with positive attitudes towards IPE and IPC (Pollard & Miers, 2008). Miscommunication occurred between residents and nurses, with each group expecting information from the other and perceiving a failure to supply it (Muller-Juge et al., 2013a).

‘Getting acquainted’ worked in the Internal Medicine IPE ward (chapter 4), where a training day for students at the beginning of the 3-week IPE ward experience was informative for students. In our interviews, several students recalled one of the training subjects: small group development. In their team, these students had recognised elements of the team phases ‘forming, storming, norming, and performing’ described in Tuckman’s model (Bonebright, 2010). According to this model, each phase must be successfully navigated in order to reach effective group functioning. The focus in Tuckman’s model is on interpersonal relations and task activities (Table 2).

**Table 2. Interpersonal relations and task activities as described in Tuckman’s model.**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Interpersonal relations</th>
<th>Task activities</th>
</tr>
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<tbody>
<tr>
<td>Forming</td>
<td>Testing and dependence, with team members orientating themselves, starting hesitant participation and experiencing confusion and/or curiosity</td>
<td>1 Orientation to task</td>
</tr>
<tr>
<td>Storming</td>
<td>Intragroup conflict, where negativism or individual rivalry is being displayed</td>
<td>2 Emotional response to task demands</td>
</tr>
<tr>
<td>Norming</td>
<td>Development of group cohesion, with trust formation and norms becoming clear</td>
<td>3 Open exchange of relevant interpretations</td>
</tr>
<tr>
<td>Performing</td>
<td>Functional role relatedness when the group is functioning effectively</td>
<td>4 Emergence of solutions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 Adjourning the team*</td>
</tr>
</tbody>
</table>

*Added later (Tuckman & Jensen, 1977).
From what the students in our study relayed, we inferred that students were proud that within 3 weeks their team had reached the ‘performing’ stage. Supervisors on this IPE ward were found to support students who felt they were caught in a communication where they perceived themselves as having lower status and less power. This can be considered as guiding students to reach an open exchange of relevant interpretations (Tuckman’s task activity 3). We consider Tuckman’s interpersonal and task activity stages helpful in explaining the findings in our thesis regarding group dynamics. Furthermore, because the students recollected the team stages vividly, the stages appear to be a practical way of explaining to students how group dynamics can evolve when students who are not acquainted and from different professions are combined in an interprofessional team. However, Tuckman et al. acknowledged that more research into small group formations was needed to verify concepts (Tuckman & Jensen, 1977).

### IPE characteristic 3: Readiness to see more perspectives

Readiness for interprofessional learning is often used as an indicator of change in attitude towards IPE, measured before and after an IPE initiative. In our literature review, readiness for IPE was found to fluctuate over the years of training (Visser et al., 2017). Other professions were perceived more positively when students could participate actively in IPE and could guide their learning. Integrating the profession-specific learning goals with the IPE-specific learning goals helped students to balance their learning. Overall, at the cultural level students perceived IPE as valuable in helping to appreciate the difference between professions, making them better prepared for clinical placement. When students found IPE less valuable, this was attributed to perceived hierarchy. At the curricular level, IPE was valuable to students when it was well timed, activating, in small groups, and about an authentic patient problem. Medical students specifically experienced stress and frustration when the interprofessional learning goals, e.g. communication skills, were perceived as taking higher priority than acquiring technical skills. Medical students found IPE less valuable when it was not assessed or when there was limited exposure to other professions. At the individual level, all students were hampered in IPE when they felt uncertain in their role. Positive factors at the individual level were underrepresented in the literature.

From the 65 studies in the literature review, 10 used the Readiness for Interprofessional Learning Scale (RIPLS) (Parsell & Bligh, 1999) as an evaluation instrument. In the adapted McFadyen version, the RIPLS consists of four subscales: Teamwork and collaboration, Positive professional identity, Negative professional identity, and Roles and responsibilities (McFadyen et al., 2005; McFadyen et al., 2010). The RIPLS is currently being translated for learners in more countries, including Indonesia (Lestari et al., 2016; Tyastuti et al., 2014) and China (Ganotice & Chan, 2018). Judge (2015) investigated student attributes influencing the RIPLS scores. The student characteristics associated with lower levels of readiness for IPL were being male and having more years of experience in practice; medical students had lower levels of readiness for IPL than students from pharmacy and dietetics (Judge et al., 2015).

We investigated readiness for IPL among medical students as a concept (chapter 3), by relating it to the concepts ‘Motivation for medical school’, ‘Empathy’, and ‘Professional identity development’. Around 14% of the variance in the combined subscales ‘Positive and Negative Professional Identity’ was explained by gender (being female) and belonging to the first year of medical school, not by motivation. Around 16% of the variation in the readiness for IPL subscale ‘Teamwork and collaboration’ was explained by motivation and the cognitive component of empathy, entailing ‘Taking the perspective of the patient’. We found that the willingness and ability
to take someone else’s perspective is a key aspect of empathy, and also seems to be an essential component of readiness for IPL. Therefore, we recommend that curricula extend the concept of perspective taking to include not just the patient but also other professionals, to facilitate interprofessional care management decisions.

Given the fluctuation of readiness for IPL over the years, the importance of assessing IPE learning goals and profession-specific goals, we infer that readiness for IPL cannot be considered a threshold that, once passed, results in learning. Rather, readiness for IPL requires the same teaching principles as readiness for learning (Conley & French, 2014). These teaching principles are in congruence with the LOT model (ten Cate et al, 2004), which posits that students need teaching of the content (what) and the reason (why), together with the metacognitive skills to monitor their learning and deal with frustration (Blue et al, 2010), and should be encouraged towards increasing self-guidance.

**IPE characteristic 4: Autonomy-supportive learning environment**

In an autonomy-supportive learning environment, an increasing amount of self-guidance by the student correlates with a decreasing amount of guidance by the teacher or supervisor. We studied the interactions between supervisors and students in two locations in the Netherlands.

The first IPE ward (described in chapter 4) was a university hospital internal medicine ward that offered a 3-week IPE initiative for students from five professions. We interviewed the students and their supervisors separately.

At the curricular level, students experienced that they had real problems to solve (authentic learning situations). Furthermore, they could contribute from their professional expertise (with supervision, but students were in the lead). Being with other learners meant that it was easier to ask questions and recognise when further information should be sought. Giving feedback to another student who was familiar, rather than from an ‘out-team’, was perceived as less difficult. In our secondary analysis, the combination of the IPE ward setting, the supervisors, the learning goals for the students, and the IPE room were found to satisfy students’ feelings of choice, competence, and relatedness. These feelings form the basic psychological needs that, according to Self-Determination Theory (SDT), are important in the quality of motivation (see IPE characteristic 5).

Students indicated that before the IPE initiative, they had a poor awareness of the clinical reasoning of other professions; gaining insight into others’ clinical reasoning enabled them to ‘see the pieces of the puzzle’, enhancing their sense of competence. The supervisors involved also valued the insights gained from observing the clinical reasoning of other professions during the patient care meeting.

Our finding regarding the clinical reasoning of other professions could explain why a traditional rotation on a ward, even though students and supervisors from other professions are present, does not result in interprofessional learning. Unless the clinical reasoning of a profession is clearly articulated, others who are unfamiliar with the cognitive processes involved may not follow what is happening.

To pursue this articulation of clinical reasoning further, we were interested in how supervisors could offer guidance to an interprofessional team of students regarding their clinical reasoning. Therefore, our research question for the second IPE ward initiative was, ‘How do supervisors perceive the scaffolding of students’ clinical reasoning to come to interprofessional patient care plans?’ And in addition: ‘How do supervisors perceive the effects of this scaffolding on students?’ (chapter 5). The IPE ward for this study concerned a city hospital maternity ward that organised a 1-
week IPE initiative for students from three professions. After observing the patient care meeting where each student presented a patient, we interviewed the supervisors. From these interviews, 40 themes emerged.

We compared the findings with an existing framework for scaffolding of learning (van de Pol et al, 2010) that relates the intentions and means for supervisors to guide students’ learning. This framework can provide useful information for future supervisors involved in an IPE ward, by enhancing their awareness of the intentions and means they already apply and those they see among their peers. Moreover, several ‘means for scaffolding’, such as structure in the patient care meeting, form a part of the IPE ward setup.

In both IPE wards, the autonomy-supportive guidance or scaffolding of the learning provided by the supervisors was crucial. Bleakley and Bligh (2008) have pointed out the significance of an autonomous relationship between medical students and patients, with the doctors as a resource. They advocate a new type of apprenticeship, in which students are supported in understanding their patients themselves (Bleakley & Bligh, 2008). The IPE ward initiatives in our studies offered this type of relationship, by making the student team feel responsible for the patients assigned to them, allowing for autonomous relationships of students with patients, students with students from all professions, and students with different professionals who can serve as role models.

**IPE characteristic 5: Immersing students in interprofessional decision making**

In the interviews with students (chapter 4) and from what we inferred from the observations (chapter 5), we concluded that the clinical setting offered students an opportunity to function like a professional, as well as behaving and looking like one. Charles et al. (2010) refer to this learning environment as ‘immersion’: students are in the process of acquiring the core knowledge and skills of their profession, while developing a sense of themselves as practitioners and at the same time growing in confidence as professionals. At this stage, worldviews held by others are less likely to threaten students in their own view; this in turn makes it easier for them to accept that multiple valid perspectives exist (Charles et al, 2010).

Final-year students can take care of patients, sharing the responsibility for them with professionals, and ask professionals outside the IPE ward for consultations. Hudson et al. (2016) exposed medical students to interprofessional teams for 3 weeks and found a decline in readiness and patient-centredness. Hudson et al. suggest that the exposure of first-year medical students to interprofessional teams suffered from three effects: students did not embrace the opportunity to care for patients; preceptors were not willing or confident enough to allow students to care for patients; or the fragmented nature of the placement that some services offered hindered students’ opportunity for patient care. In contrast, the IPE ward initiatives in our study were more successful in attainment of professional and interprofessional learning goals; perhaps this can be explained using the SDT perspective of fulfilment of basic psychological needs. Checking the three basic psychological needs indicated by Ryan and Deci (2000) against the IPE ward characteristics allows for an understanding of the essential prerequisites for an IPE ward.

- **Competence**: Students indicated that sharing the learning experience with other students was important, because asking questions felt natural. This was reinforced by the professionals involved in their IPE ward, who directed most content-related questions to students from a professional background that increased their likelihood of being able to answer it.
• **Autonomy**: In both IPE ward initiatives, the students were in the lead, providing information about the patient and proposing the policy for their treatment. Supervisors empowered students to discuss specifics in the student team, especially when students perceived themselves as having lower status and less power.

• **Relatedness**: Mutual relations were facilitated by working closely together in an IPE room on the ward, meeting daily, and having supervisors who stimulated students to have lunch together.

When comparing our results from the internal medicine and the maternity IPE wards, we noticed in the interviews that students working within their own profession (chapter 4) acknowledged the perspectives of the other profession(s) as well as general professional boundaries. Students recalled either having asked for a consultation or proactively having provided information for another profession. In the 1-week maternity IPE ward, students also performed nursing tasks for the patients assigned to them (chapter 5); here, the professional boundaries seemed to blur. During the patient care meeting, the students narrated experiences with patient care. They recalled their hands-on experience from a nursing perspective. The nursing supervisors explained certain aspects of care to students of all professions – such as preparing for discharge and giving information to patients and their relatives. Bedside teaching by the nurse supervisor meant that her role modelling was also observed. Part of this bedside teaching involved nurse supervisors providing feedback to students from all professions. From the interviews with the supervisors (chapter 5), we infer that this helped the students to feel competent.

**IPE characteristic 6: Involving the professionals**

In the organisation of the IPE wards that we studied, healthcare professionals (HCPs) were involved as supervisors of the students. Adapting the definition of Kilminster et al. (2000) to our target population, the supervisor offers monitoring, guidance, and feedback on matters of personal, professional, and educational development in the context of the student’s care of patients (Kilminster & Jolly, 2000). We interviewed the supervisors who were involved in both IPE wards described in this thesis. A discernible effect of the IPE ward on supervisors operated at each level distinguished in the literature review.

**At the cultural or organisational level**

Supervisors involved in the 3-week IPE ward mentioned that this teaching commitment extended their workload (chapter 4). The patient care meeting and bedside teaching meant that they had to refer their usual patient load to one or more colleagues, meaning that preparations for their tasks in research or education had to be rescheduled. However, the supervisors acknowledged the benefit to ward practice that the IPE initiative brought to light any ambiguity in protocols, which could then be resolved.

**At the curricular or process level**

Most supervisors learned about other professions from peer-supervisors and from students. Supervisors self-reported that the IPE initiative influenced their decision making and/or the way in which they communicated their professional decisions. A medical supervisor noted that listening to one pharmacy student’s briefing of the student team led him to reconsider his decision regarding the medication; in his words, ‘the decision was taken less routinely’. A nursing supervisor came to understand, and could explain to nursing students who were not in the IPE ward, why physicians
need certain information from nurses in a timely manner. In the interviews, several supervisors (from all the professions involved) appreciated that their peers were a role model for them in asking questions of students and stimulating teamwork among them. Supervisors mentioned that they could discuss a student or a student team to align their guidance, which might be attributed to a feeling of interdependence or relatedness between supervisors.

At the individual level

Supervisors from both IPE wards indicated that their interprofessional collaboration with other supervisors was enhanced by being acquainted before the start of the IPE, or getting to know each other before and after patient care meetings. These supervisors were educated and socialised in their professional silos, but without specific IPE/IPC training there was a risk that they might not be a good role model for IPE initiatives, or might confirm stereotyped views of professions. In both IPE ward studies, it seemed that the IPE initiative had a positive effect on the relatedness of supervisors, meaning that they considered themselves included in the supervisor group – an encouraging development resulting from the IPE initiative.

IPE characteristic 7:
Structuring the interprofessional clinical reasoning

Based on our findings in the literature review, we suggested a structure to be used for the patient care meeting in the IPE ward initiatives. This structure contained steps similar to those in most professionals’ clinical reasoning: assessment of the current situation, generating a problem inventory, performing a differential diagnosis, putting together a care plan, deciding on interventions, following up, and summarising. This structure clarified how a student was expected to present a patient to the team: which basic information was needed, in a concise manner, before a student or the team could communicate ideas for the decision making and management of patient problems. Not all professions involved in the IPE wards we studied were used to this kind of structure for patient presentation. Inherent to supplying a structure was the notion that all students would have something to report about the patient. This might have helped to counterbalance stereotyped views and hierarchy, although we did not investigate this aspect. Nursing and physiotherapy students preferred to ‘take their turn’ in sharing their information about the patient, so as not to ‘interrupt others’ thinking processes’.

The benefits of providing a structure for interprofessional meetings is acknowledged by others too: HCPs in interprofessional teams in the hospital setting had a limited understanding of the roles of other team members they met during rounds (Baker et al, 2011; Goldman et al, 2015; Hudson, 2009) and considered that at times, less relevant information was exchanged during rounds (Reeves et al, 2009). Furthermore, team members had different priorities for the rounds. Therefore, team members anticipated that integrating a script into rounds would enhance participation, role clarity, and information exchange during rounds (Prystajecky et al, 2017). In a simulation study into the interprofessional clinical reasoning of residents and nurses, Blondon et al. (2017) found the following as critical: diagnostic reasoning, patient management, patient monitoring, communication with the patient, and team communication (Blondon et al, 2017); they advocate enhancing awareness of the differences in clinical reasoning, with a view to improving interprofessional collaboration.
Implications of the thesis

Combining the seven IPE characteristics mentioned above, we sought to inform motivating IPE. Our research indicates (1) the importance of authentic learning situations and (2) the stimulating of positive group dimensions. When (3) students are willing and able to see more perspectives (readiness for IPL included), and they are offered (4) an autonomy-supportive environment, it is possible to (5) immerse the students in interprofessional decision making. Then, (6) the process forms part of the results, because professionals are involved in IPC and learn with from and about other professions. Finally, offering (7) a structure for the students’ team interprofessional clinical reasoning enhanced the insights into the roles and responsibilities of each profession for students and their supervisors.

From the seven IPE characteristics and our experiences on the IPE wards, we inferred the importance of clinical reasoning of each profession in enhancing motivation for IPE. How, then, can clinical reasoning perform this important role in IPE and IPC?

From the start of the 21st century, training in communication has formed a considerable part of medical education; in the same period, curricula have allocated time to learning in small groups of students, assigned with tasks characterised by interdependence, etc. (Ten Cate, 2007) (Laan et al, 2012). Shared learning of students has been organised, which means that the knowledge base is to some extent comparable. Moreover, education for medical, nursing, and allied health professions in the Netherlands is based on the CanMEDS roles and competencies (Frank et al, 2015). The same competencies are incorporated for diverse professions: expert role, communication, collaboration, prevention, improvement of quality of care, managing processes, and professionalism (Frank et al, 2015; IPEC, 2016; Verma et al, 2006; Westein et al, 2018). For the workforce in healthcare, the World Health Organization (WHO) published the International Classification of Functioning, Disabilities and Health (ICF). The ICF is intended to facilitate communication among HCPs about elements in the patient situation (WHO, 2001). Both documents suggest that HCPs share a common language and several competencies, while at the same time specific competencies for each profession can be distinguished. This is reminiscent of the ‘T-shaped professional’, a metaphor introduced by Guest (Guest, 1991). In scientific literature, the metaphor of the T-shaped professional (Figure 1) is used to describe the abilities of persons in the workforce (Ing, 2008). The vertical bar of the T represents the depth of expertise and related skills in a single field, while the horizontal bar is the ability to collaborate across disciplines with experts in other areas (Donofrio et al, 2010).

From the shared set of competencies and the setup of medical education, combined with the time and energy spent on communication skills, one would expect the HCPs to have acquired the knowledge and skills for IPC. However, in our studies we found that until the IPE ward not all HCPs were aware of the clinical reasoning of other professions, particularly how they perform their analytical process. In addition, we found that several students indicated that, until the IPE ward rotation, they were unaware that nurses and physical therapists also perform clinical reasoning. All students considered the clinical reasoning of other professions as an extra element in the learning with, from, and about other professions (Visser et al, 2018).

According to Kreiter and Bergus (2009), all definitions of clinical reasoning suggest that it is a cognitive activity that integrates information from a clinical encounter with an existing system of knowledge organisation. This integration of information enables diagnostic and patient management decisions (Kreiter & Bergus, 2009). Aijawi and Higgs (2008) describe the learning of clinical reasoning as an integral part of professional socialisation: the ongoing development of individuals through...
interaction with their environment and environmental situations (Ajjawi & Higgs, 2008). Thus, clinical reasoning is an important element of each HCP’s expertise.

**Figure 1.** T-shaped professional: deep professional competencies (vertical bar) and the ability to collaborate with other professionals (horizontal bar).

In the definition of IPE, clinical reasoning is not explicitly mentioned or incorporated in the learning of roles and responsibilities (CAIPE, 2015). For the purpose of this thesis, we argue that clinical reasoning is the analytical capability for the decision-making process in combination with the capability to communicate about this process, as a way to account for the analysis (Fleming & Mattingly, 1994). We recommend incorporating the clinical reasoning of all professions involved in an IPE activity in the ‘learning with, from and about’. Using the T-shaped professional’s competencies as a starting point, we will explain the position which we see for clinical reasoning.

In their analytical process, different professions take different components of the patient situation under consideration (Trede & Higgs, 2008). For example, a dietitian will consider specific patient bodily functions – such as the patient’s actual versus optimal body weight, underlying illnesses, and mobility – along with their daily functioning, including food preferences. Obviously, the physical therapist will consider other scopes, such as bodily functions (e.g. balance, mobility, and condition) in combination with daily functioning and societal participation, which will have their own classification in the ICF (Khatami, 2010). It is important to acknowledge these different professional aspects of interprofessional communication, because they form the perspective of a profession.

From the literature, we can conclude that the professional perspective is part of the vertical bar of a T-shaped skills and knowledge set. However, when professionals with different backgrounds
are able to combine their perspectives, ‘communication, collaboration and complementarity’ lead to IPC (Engel, 1977). We therefore consider the perspective of a profession to be the connecting point between the vertical (profession-specific) bar and the horizontal (general competencies) bar of the T-shape. Based on our findings (Visser et al, 2018) and the literature, we place the perspective of a profession at the heart of the T-shape. Through thinking and communicating, clinical reasoning forms the linking pin between the profession-specific and general knowledge and skills. To depict this professional perspective in the T-shape, we have chosen a hexagon (Figure 2).

Figure 2. Clinical reasoning of a profession placed where the profession-specific and the general competencies meet.

This central place for clinical reasoning implies that students need to master enough skills to perform their profession-specific clinical reasoning and to communicate about it. Windish et al. (2005) have shown that an integrated curriculum for communication skills and clinical reasoning fosters the development of clinical reasoning processes in second-year medical students. These students recognised the importance of biomedical and psychosocial issues in patient care (Windish et al, 2005). On the two IPE wards reported in this thesis, students close to graduation were able to perform a clinical reasoning as well as communicate about their professional perspective, and could appreciate the similarities and differences in the clinical reasoning of other professions.

In the concept of IPE and IPC, all perspectives are valued and their combined value is generated through interaction. As already explained, we perceive such clinical reasoning abilities as pivotal to learning about and informing other professions.
To capture the findings in this thesis, we have placed the factors in a circle (Figure 3). The circle holds the emerging findings which enhance the affective component at cultural, curricular, and individual levels in interprofessional education and at the cultural, process, and individual levels in interprofessional patient care.

Through interprofessional education in healthcare, students develop general competencies for communication (in the horizontal bar) and profession-specific competencies (in the vertical bar), connected by their ability to communicate to other professions about all professional perspectives relevant to solve the problems in the patient’s situation.

Figure 3. An overview of the factors from our studies to be considered when integrating IPE into a curriculum.
Surrounding the T-shaped professional are the factors that in this thesis are found to facilitate interprofessional learning and collaboration:

- **At the individual level**: Factors within students, such as being female and having role clarity, were positively associated with readiness for IPL. Peers and teachers from a student’s own profession are the ones to develop relatedness with, which helps to address the ‘why’ of learning.

- **At the curricular level**: Students appreciate IPE more when the IPE learning goals are integrated with the profession-specific learning goals and when students are immersed in IPE. It is important to maintain structure in the patient care meeting and encourage seeing others’ professional perspectives.

- **At the organisational level**: Within the culture of an organisation, important factors for the success of IPE are ongoing interaction, getting acquainted (through informal contact), and the extent to which professionals exchange information only within their group or also among professional groups.

**Practical implications**

The seven IPE characteristics that positively impact on the affective domain of IPE, together with the implication of the T-shaped healthcare professional with a central role for clinical reasoning, form the practical implication of this thesis. We propose three practical implications:

- For the development of an IPE curriculum, we advocate that students from each profession should be able to participate in authentic learning situations, solving patient’s problems as presented either theoretically (on paper) or in real-world practice (on the ward). Consequently, professional clinical reasoning must be mastered by the student to the extent needed to solve the authentic patient’s problem(s), under guidance. Both in the classroom situation and on the ward, scaffolding of the students’ learning should also include stimulation of positive group dynamics and assessment with an informative function, so that students can reflect on their interprofessional learning activities.

- When IPE is in place, the IPE activity or IPE curriculum could be checked against the seven IPE characteristics outlined in this chapter.

- A limited set of characteristics can be chosen for an ‘IPE Light’ version, although care should be taken to not enhance stereotyped views, imbalance between student team members, or lack of clarity regarding ‘What/Why/How?’ learning questions.

**Strengths and limitations of the thesis**

Through our review, we found a gap in the literature concerning individual perceptions of IPE. This prompted us to investigate the factors in an IPE ward initiative that motivate students for IPE, from the perspective of SDT. By using SDT in a secondary analysis, it appeared that students came to value IPE, leading to a change in behaviour. This evaluation of IPE is at Kirkpatrick level 3, whereas most other studies are evaluated through self-reported gains in knowledge and attitudes, at Kirkpatrick level 2a or 2b (Thistlethwaite & Moran, 2010).

Furthermore, we consider it a strength of our study that two mechanisms were revealed through our qualitative studies. The first of these is the important role of an explicit structure for the patient care meeting, which allowed students to discover the clinical reasoning of other professions. The second is attention to the role that clinical reasoning fulfils in learning about the roles and responsibilities of other professions, as found in an authentic hospital setting. This information
Informs elements of the inner circles ‘Education’ and ‘Patient care’ depicted in the IECPCP model (D’Amour & Oandasan, 2005).

Additionally, we reported on an internal medicine IPE ward – a relatively new patient category, compared with the IPE wards typically studied in Sweden and Denmark (Jakobsen, 2016).

Regular wards, where students from different professions learn under supervision from their own profession, are not places where interprofessional learning occurs spontaneously. We consider it a strength that our literature review focused on papers where medical and nursing students participated together and where learning took place in a clinical setting. Several facilitators of and barriers to IPE at the cultural and curricular level were found and later recognised in the IPE ward initiatives of our subsequent studies in interprofessional practices. Our studies concerned IPPL, which according to Paradis and Whitehead (2018) forms the fourth wave in IPE, offering a combination of authentic learning situations and involvement of professionals who are in a position to change the culture of healthcare in ‘a logistically more straightforward and less costly manner’ than schools and universities (Paradis & Whitehead, 2018).

It should be acknowledged that this same setting could be seen as a limitation: since both IPE wards under investigation were in Dutch hospitals, this might make it difficult to generalise our results for other healthcare systems.

Another limitation of this thesis is that we did not evaluate the clinical reasoning of students, nor the resulting care plans, other than by asking supervisors to rate the quality of such care plans and indicate whether they considered them to be interprofessional. Assessing the learning outcomes of IPE initiatives is considered an educational challenge, because each individual student’s competence can also be influenced by the team and the setting (Freeth et al, 2008).

Another limitation is that, although we found barriers to IPE on the culture, curriculum, and individual in the literature review as well as in the interviews in our studies in chapter 4 and 5, we did not expand on these barriers – such as by considering hierarchical factors that may be involved (Baker et al, 2011).

**Suggestions for further research**

The findings in this study do not provide all the insights necessary for medical schools and schools for allied health professionals to incorporate IPE in their curriculum or to develop an IPE curriculum.

For future studies, the following research questions have been identified:

- Combining the information from chapter 5 and our recommendations, mixed-methods research could shed a light on the question ‘How do students perceive the clinical decision-making process and results within IPE authentic learning situations?’
- From chapter 3, it became clear that readiness for IPE is not a threshold, and in chapter 4 that students can be guided to value IPE. In the perception of supervisors, which assignments enhance students’ readiness for IPL?
- What is the effect of clinical reasoning as an integral part of the training of communication skills (compare Windish, 2005) on interprofessional communication?
- In chapters 4 and 5, the supervisors learned with, from, and about the roles and responsibilities of their peer-supervisors. Some supervisors indicated that they became better acquainted with each other; others welcomed IPE as a refreshing change of routine. What do professionals and the management on the IPE ward perceive as effect of an IPE initiative on their collaboration?
Valorisation of the research in this thesis

In this thesis, several components are based on empirical evidence. In the following paragraph, concerning valorisation of our research and pointing out which steps educators can take when implementing parts of our evidence, we argue for initiatives that are not yet in place; we believe they deserve testing through studies in schools and clinical settings.

In medical schools, the teaching of clinical reasoning can gain new impetus: learning-oriented teaching using peers from several disciplines to learn how to communicate about problems in a specific patient scenario. In our own medical school, we intend to involve medical and nursing students in patient care presentations to train and to assess their clinical reasoning.

A topic traditionally incorporated in medical schools can be connected to IPE, namely the cognitive aspect of empathy; this ‘Taking the perspective of the patient and communicate it’ could be extended to ‘Taking the perspective from another profession and communicate it’.

Educating future HCPs for IPC through IPE can optimise their communication and clinical reasoning to come to interprofessional care plans. The characteristics of the IPE described in the discussion of this thesis can be implemented on several wards where students from different professions now are co-located for their rotation, but do not spontaneously learn with, from, and about each other. In chapter 5, we have seen that an IPE ward duration can be as short as a week. Better interprofessional collaboration will improve patient safety and thus decrease the costs and consequences of mistakes or suboptimal care.

These options are aimed at incorporating IPE as a topic in such a way that it organically fits into an already heavy loaded curriculum and impacts on the motivation of students for interprofessional education.
References


